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1991 PUGET SOUND WATER QUALITY MANAGEMENT PLAN

Adopted November 21, 1990



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Adopted November 21, 1990

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PUGET SOUND WATER QUALITY AUTHORITY

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January, 1991

To Governor Gardner, the Legislature, and the Citizens of Washington State:

It gives us great pleasure to present you with the 1991 Puget Sound Water Quality Management Plan. This plan builds on the 1987 and 1989 plans and contains needed improvements to make it more effective. Thanks to your actions and support, much progress has been made to protect Puget Sound since the formation of the Authority. Implementing this plan will take us even closer to the goal of a clean Puget Sound.

We represent diverse perspectives on the difficult issues involved in protecting the Sound. Our unanimous support of this plan is an important indication of the hard work, compromises, and spirit of cooperation embodied in it. We are particularly appreciative of the outstanding work of local governments, state agencies, tribal governments, federal agencies, businesses, organizations, and citizens, both in taking the actions called for in the 1987 and 1989 plans and in helping us to evaluate and improve the plan.

Despite the progress that has been made, much remains to be done. Increased funding for implementation is essential for the protection of Puget Sound. We recognize how difficult this will be to accomplish. But we must all make every effort to meet the challenge to protect and preserve Puget Sound for ourselves and our children.

We ask your full support in achieving this plan so that Puget Sound will remain a resource of unparalleled richness and diversity.

Christine Gregoire

Christine Gregoire
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STATE AND FEDERAL AUTHORITY FOR THIS PLAN

RCW 90.70.055 requires the Authority to prepare and adopt a comprehensive Puget Sound water quality management plan, as defined in RCW 90.70.060. The 1987 and 1989 Puget Sound Water Quality Management Plans were adopted pursuant to this requirement. RCW 90.70.055(3) requires that the plan be reviewed and revised every two years. The development of the 1991 plan was undertaken in compliance with this section. The 1990 Washington State Legislature adopted amendments to Chapter 90.70 RCW (Chapter 115, Laws of 1990) that require the Authority to adopt the next plan revision by July 1, 1994, and every four years thereafter.

In March 1988 the Administrator of the Environmental Protection Agency formally designated Puget Sound as an estuary of national significance under Section 320 of the Clean Water Act, as amended by P.L. 100-4 (the Water Quality Act of 1987). This made Puget Sound part of a nationwide program to develop management plans for the protection of the nation's estuaries. The Puget Sound Water Quality Authority, together with EPA Region 10 and the Washington Department of Ecology, co-manage the Puget Sound Estuary Program. Section 320 requires the development of a comprehensive conservation and management plan (CCMP) for each designated estuary. The designation of Puget Sound recognized the 1987 Puget Sound Water quality Management Plan as a partial CCMP. The 1989 plan constituted an additional increment to the CCMP. The 1991 plan, when adopted, will be the CCMP for Puget Sound.

ACKNOWLEDGEMENT

The Puget Sound Water Quality Authority acknowledges financial and technical support from EPA's Office of Marine and Estuarine Protection and the Region 10 Office of Puget Sound. These funds, approximately \$10 million from FY85 to FY90, provided support for technical studies, development of management tools, and other projects which helped provide the basis for developing the Puget Sound Water Quality Management Plan. This support was provided under the authority of Section 320 (the National Estuary Program) of the Clean Water Act of 1987, as well as through Congressional appropriations in previous years to support the Puget Sound effort.

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Preface

The legislature finds that Puget Sound and related inland marine waterways of Washington state represent a unique and unparalleled resource. A rich and varied range of marine organisms, composing an interdependent, sensitive communal ecosystem reside in these sheltered waters. Residents of this region enjoy a way of life centered around the waters of Puget Sound, featuring accessible recreational opportunities, world-class port facilities, and water transportation systems, harvest of marine food resources, shoreline-oriented life styles, water-dependent industries, tourism, irreplaceable aesthetics and other activities, all of which to some degree depend upon a clean and healthy marine resource.

The legislature further finds that the consequences of careless husbanding of this resource have been dramatically illustrated in inland waterways associated with older and more extensively developed areas of the nation. Recent reports concerning degradation of water quality within this region's urban embayments raise alarming possibilities of similar despoliation of Puget Sound and other waterways. These examples emphasize that the costs of restoration of aquatic resources, where such restoration is possible, greatly exceed the costs of responsible preservation.

The legislature declares that the utilization of the Puget Sound resource carries a custodial obligation of preserving it. The people of the state have the unique opportunity to preserve the gift of nature, an understanding of the results of inattentive stewardship, the technical knowledge needed for control of degradation, and the obligation to undertake such control.

The legislature further finds that the large number of governmental entities that now affect the water quality of Puget Sound have diverse interests and limited jurisdictions which cannot adequately address the cumulative, wide-ranging impacts which contribute to the degradation of Puget Sound. It is therefore the policy of the state of Washington to create a single entity with adequate resources to develop a comprehensive plan for water quality protection in Puget Sound to be implemented by existing state and local governments.

—excerpt from the 1985 legislation creating the Puget Sound Water Quality Authority (RCW 90.70.001)

Summary



This document is the 1991 Puget Sound Water Quality Management Plan. It is also being submitted to EPA for adoption as the Comprehensive Conservation and Management Plan (CCMP) for the Puget Sound Estuary Program, as authorized by the federal Clean Water Act. As a CCMP, the plan addresses federal actions affecting Puget Sound.

The 1991 plan builds on the progress made in carrying out the 1987 and 1989 Puget Sound plans. The plan includes revisions to the 1989 plan; new programs in estuary management, fish and wildlife habitat protection, and the Puget Sound Foundation; several new elements in the spill prevention program; new elements in several programs addressing pesticides and pest management; and a brief discussion of issues which the Authority may choose to address in the 1995 plan.

This plan is organized into four chapters. Chapter 1 provides an introduction to the plan, discusses strategies for plan implementation, and describes coordination with other planning programs. Chapter 2 is a summary of findings about the Sound, its population and resources from *The State of the Sound 1988 Report*. The expanded and updated action plan, and priorities for the plan, are contained in Chapter 3. Chapter 4 discusses the unfinished agenda. A glossary, a list of acronyms, an index, a summary of regulations for Local Planning and Management of Nonpoint Source Pollution (Chapter 400-12 WAC), and copies of RCW 90.70 (the statute establishing the Authority) and Section 320 of the federal Clean Water Act (33 U.S.C. 1330), which establishes the National Estuary Program, are provided at the end of the document.

The Authority based previous plans on a number of key findings about Puget Sound's water quality. Programs were developed to address major concerns, such as pollution from point and nonpoint sources, loss of wetlands, and shellfish protection. While much progress has been made in implementing these programs, the Sound's problems are long term and the solutions will necessarily be long term as well. An updated list of key findings is included



here as a reminder of the problems in Puget Sound that require continued attention.

Key findings upon which the plan is based include:

- Most pollution is not “flushed” from the Puget Sound system. Water and pollutants are recirculated within Puget Sound, and some inlets and bays experience only limited tidal exchange.
- By the year 2010, population in the Puget Sound region is expected to grow by nearly 40 percent, from 3.2 million to almost 4.4 million. Roughly 60 percent of this growth will come from in-migration and 40 percent from natural increase.
- Land use forecasts suggest an increase of 62 percent for urban use and 73 percent for rural non-farm use by the year 2000. Most of this intensively used land is projected to be in the central Puget Sound region.
- Toxic contaminants bind to particles and settle out in the sediments. Concentrations of toxicants in sediments in the Sound’s urban bays are elevated 100 times or more over the levels in the cleanest rural bays.
- High concentrations of toxic contaminants in sediments have been associated with adverse biological effects in fish in urban bays, including fin erosion, liver tumors, and reproductive failures.
- While substantial progress has been made toward limiting conventional pollutants in discharges, and progress is beginning to be made toward limiting toxic pollutants, the discharge of toxic pollutants is not yet effectively controlled.
- Since 1986 nine additional commercial shellfish beds have been reclassified to a more restrictive status, almost all due to nonpoint source pollution. These nine restricted beds account for 13,940 acres of productive growing area, or nearly 18 percent of the entire commercial shellfish growing area in Puget Sound. Nonpoint sources include failed septic systems, animal wastes, and contaminated stormwater. Nonpoint source pollution is likely to increase as the Sound’s rural areas continue to develop.
- Over half of the Sound’s original wetlands have been lost. The Department of Ecology estimates that between 716 and 2,034 acres of wetlands are lost each year in Washington state. The rapid rate of population growth in the Puget Sound basin poses a great threat to remaining wetlands. In some watersheds, the only developable land left is not land at all, it is wetland.

Despite the problems cited, there are significant success stories where water quality has been improved around the Sound. Industrial and municipal pollution controls have had dramatically positive results, and the banning of a few toxic chemicals and restrictions on some others have begun to be reflected in the lower rates at which they are accumulating in the bottom sediments of the Sound. Individual and local efforts have also begun to reduce sources of non-point pollution in some areas.

There has been considerable progress in implementing the Puget Sound Water Quality Management Plan. All of the programs are being implemented, and several milestones have been reached.

This 1991 plan updates and refines existing plan programs to reflect the experience to date in implementing them. The plan also proposes new programs or elements resulting from issue papers addressing pesticides, spill prevention, and protection of fish and wildlife habitat. It responds to Chapter 115, Laws of 1990, the 1990 revisions to the Authority's authorizing legislation, by establishing a program for the Puget Sound Foundation. And it responds to federal authorization for the plan by formalizing the management structure of the Puget Sound Estuary Program and addressing federal activities. The plan also proposes new financing options to provide adequate funding for Puget Sound programs.

THE ACTION PLAN

The purpose of this plan is to restore and protect the biological health and diversity of Puget Sound. The strategy for achieving this purpose is to protect and enhance the Sound's water and sediment quality; its fish and shellfish; and its wetlands and other habitats.

PRIORITIES

The Authority has established broad priorities for the plan which are listed in alphabetical order:

- Assess the environmental conditions of Puget Sound, its resources, and the effects of human activities on them.
- Clean up existing toxic contamination where sources are controlled.
- Continue plan programs that have been started and maintain current funding levels for them.
- Control sources of toxic contaminants to Puget Sound.
- Enhance protection of shellfish beds.
- Ensure the protection of wetlands and aquatic habitat. Stop losses of wetlands and other aquatic habitat.
- Improve the control and cleanup of nonpoint source pollution in the Sound.
- Prevent spills in the Sound and enhance the capability to respond to spills when they occur.
- Provide long-term support for research and education.
- Support and improve education and public involvement programs in order to inform, educate, and involve citizens of the region and the state in the cleanup and protection of Puget Sound.

In addition to these broad priorities, the Authority has delineated priorities for the plan on an element-by-element basis. These are listed at the beginning of Chapter 3.

THE ACTION PLAN

The plan's programs, and significant changes to the 1989 version of each program, are summarized below:

Estuary Management and Plan Implementation

This program is new in this plan. It (1) formalizes the existing Puget Sound Estuary Program management structure; (2) proposes several new financing options to provide adequate funding for the Puget Sound Estuary Program and the management plan; (3) requires accountability by implementing agencies; (4) provides for strong enforcement at all levels of government; and (5) seeks to ensure that federal activities, including the operation of large federal facilities, are consistent with the plan.

Fish and Wildlife Habitat Protection

RCW 90.70.060(11) calls for the Puget Sound plan to include recommendations on "protecting, preserving and, where possible, restoring wetlands and wildlife habitat and shellfish beds throughout Puget Sound." The 1989 plan includes programs for wetlands and shellfish. However, it does not include a comparable program for the protection and restoration of fish and wildlife habitat with a focus on non-wetland aquatic habitats.

This program is new; it addresses the protection of non-wetland aquatic habitats (including waters of the state, riparian zones, and shorelands) by promoting coordination among existing efforts and by providing a focus for Puget Sound. The program: (1) encourages and supports efforts by federal, state, local, and tribal governments, and private organizations, to act proactively to protect rapidly disappearing habitats in the near term; and (2) coordinates among existing agencies and governments and their laws and programs to protect and manage Puget Sound habitat in the long term and to provide integrated solutions for habitat protection.

Spill Prevention and Response

Recent spills—from the huge *Exxon Valdez* spill to the *Nestucca* spill on the Washington coast—have increased concern about the need for spill prevention. Modern industrial societies depend on large volumes of gasoline, motor and heating oils, solvents and other hazardous substances to function. These substances are routinely transported and stored in huge quantities, and can cause tremendous damage when accidents happen.

The program: (1) identifies the tools and resources needed to protect Puget Sound from spills; and (2) sets forth a comprehensive spill prevention and response program using current regulations and enacting new legislation if necessary.

This program is significantly expanded from the program in the 1989 plan. Several new elements focusing on spill prevention are proposed. These include: implementing the States/B.C. Oil Spill Task Force's recommendations; amending the Environmental Protection Agency's Oil Pollution Prevention regulations to require spill prevention and containment plans at oil storage facilities; assuring that Department of Ecology staff review spill control requirements during their review of waste discharge permits; providing training on the spill prevention measures that are required in Article 80 of the Uniform Fire Code; increasing vessel safety in Puget Sound by reducing conflicts among user groups such as fishermen, ferries, commercial traffic, and pleasure craft; conducting a study on whether speed limits or other safety measures should be imposed in Puget Sound; providing spill prevention education targeting the commercial fishing industry and ports; and reviewing efforts to evaluate the effects of potential oil exploration off the coast of Washington on Puget Sound.

Monitoring

The 1989 plan established the Puget Sound Ambient Monitoring Program. Under the program, several state agencies are monitoring the Sound over time in order to assess the environmental conditions of Puget Sound, its resources, and the effects of human activities on them. The program: (1) establishes an institutional structure to manage the monitoring program; (2) implements the monitoring program design, data management system, and quality assurance plan recommended by the Monitoring Management Committee in April 1988; (3) collects, analyzes, interprets, and reports data in a manner that is useful to water quality managers and to the public; and (4) reviews the monitoring program to ensure that the most appropriate and cost-effective monitoring elements are included.

Two changes from the 1989 plan have been made. A new element has been added which calls for monitoring pesticides in Puget Sound. Another element, which directs state agencies to collect and transfer data in formats compatible with PSAMP, has been expanded to include federal and local agencies and tribal governments.

Research

The Research Program in the 1989 plan began the development of the Puget Sound Research Program. The current program: (1) maintains the Puget Sound Research Program in order to promote the coordination and funding of Puget Sound research; (2) establishes a list of research priorities for Puget Sound which are periodically updated; and (3) assists in making the results of research available to decision-makers.

The major changes proposed in the program hinge on the establishment of the Puget Sound Foundation as the long-term means of funding and implementing program functions. While the Authority will maintain (and share with the Foundation) oversight, coordination, and priority-setting functions until the Authority's scheduled termination in 1995, the Foundation will gradually assume the remaining functions in phases over the next four years.

Education and Public Involvement

The 1989 plan incorporated a long-range strategy to make Puget Sound education and public involvement more effective. The program includes: (1) a public involvement policy to be followed by agencies and local governments; (2) increased resources to state agencies and tribal governments for coordinated education programs on marine and freshwater habitats, on water quality policy issues, and on volunteer action; (3) field agents to coordinate among local and regional education and public involvement programs; (4) a Public Involvement and Education Fund (PIE-Fund) to support short-term public involvement and education efforts of both the private and public sectors; and (5) new in this plan, a Puget Sound Foundation to support long-term education and public involvement efforts of both the private and public sectors.

The program is fundamentally the same as that proposed in the 1989 plan. Besides the foundation, tribal field agents are added, and the interagency training teams are expanded to address wildlife habitat protection, integrated pest management, and public involvement in various water quality-related permits.

Puget Sound Foundation

This is a new program. It responds to a recognized need for an ongoing structure to coordinate strategies and funding for research and education. Chapter 115, Laws of 1990, authorizes the Authority to create a public nonprofit corporation under Chapter 24.03 RCW. It is anticipated that during the 1989-91 bien-

nium, the Authority will establish the Puget Sound Foundation as a nonprofit corporation. The Foundation's primary tasks will be: (1) funding and coordinating research and education programs on Puget Sound; and (2) assuming responsibility for certain elements of the research and education programs as staff and funding allow.

Household Hazardous Waste

Household hazardous wastes come from a variety of toxic products used in the home, such as paints and paint thinners, lawn and garden pesticides and fertilizers, and automotive products such as antifreeze, batteries, and oil. The use and disposal of many of these products are a chronic source of pollution to Puget Sound.

The program seeks to ensure full implementation of recent amendments to the Hazardous Waste Management Act, including waste reduction through oil recycling and conservative use of pesticides.

Additions to the program are proposed to incorporate educational opportunities for urban and suburban residents about pest management alternatives and the proper application of pesticides.

Nonpoint Source Pollution

Nonpoint sources of pollution include failing on-site septic systems, agricultural practices, forest practices, boats, marinas, and stormwater runoff, as well as other sources. This program is a three-pronged effort: (1) it targets state, federal, and local resources on priority watersheds through a cooperative process of local watershed planning and implementation; (2) it supplements the watershed plans with education and prevention programs; and (3) it develops or enhances state programs or regulations for those nonpoint sources that are most effectively controlled at the state level (this specifically includes recreational boaters and on-site septic systems).

Several changes are made to the watershed planning program: revision of the nonpoint rule (Chapter 400-12 WAC) is scheduled to begin in January 1991; language on content and approval of watershed plans is clarified; and a new subelement is added on federal funding. Two new elements addressing water quality impacts from pesticides are added. An element is added to improve the coordination of programs addressing marinas and boats. The program proposes revision of a model ordinance to address the need for sewage disposal options for all boats using a marina, not just liveaboards.

Shellfish Protection

This program focuses on better protection of both recreational and commercial shellfishing. The program includes: (1) adopting shellfish policies that will ensure that pollution source control programs protect shellfish; (2) responding to existing and potential shellfish contamination with aggressive restoration and protection programs; (3) monitoring commercial and recreational shellfish areas for toxic contaminants and indicators of pathogenic organisms, and (4) increasing public involvement and education in shellfish protection.

The changes to the program clarify the program goal; place increased emphasis on the protection of shellfish beds (both commercial and recreational) to prevent future downgrading in classification; establish a mechanism for responding very quickly to shellfish growing area downgrades; and set up a demonstration restoration project.

Wetlands Protection

Wetlands are economically, biologically, and physically valuable. More than half of the wetlands along the coasts and riverbanks of Puget Sound have been destroyed by human activity.

The greatest threat to wetlands is the rapid rate of population growth in the Puget Sound basin, an estimated 47 percent increase by 2010, and the development that will be necessary to accommodate this growth.

The program in the 1989 plan called for protection of significant wetlands through (1) preservation (purchase or other mechanisms); (2) local government regulatory programs that meet minimum state standards; and (3) a program for protecting wetlands on state-owned uplands and aquatic lands.

There are several changes and additions to the program. Proposed minimum guidelines or standards for local government wetland protection programs are detailed in element W-4. The Authority is seeking public comment on whether to adopt mandatory standards or guidelines and on the content of the standards. The program includes a larger role in wetlands protection for the U.S. Army Corps of Engineers, the Environmental Protection Agency, and the U.S. Fish and Wildlife Service. And a wetlands restoration program is established.

Municipal and Industrial Discharges

Point sources of pollution include industries and municipal sewage treatment plants. This program calls for extensive improvement in the effectiveness of the state's point source control program (including the pretreatment program) and emphasizes control of toxicants from both industrial and municipal discharges. The program: (1) requires that all waste discharge permits include appropriate monitoring requirements and limitations on toxicants and other pollutants of concern; and (2) devotes substantially increased resources to the inspection and enforcement of waste discharge permits for industrial and municipal discharges throughout the Puget Sound basin and to the discovery and control of unpermitted or illegal discharges.

There are a number of changes from the 1989 version, including some delays in new program improvements to allow the Department of Ecology a period of stability to solidify improvements to the program. Changes include: modification of discharger fees, several additional improvements to waste discharge permits, quality assurance for permits, additional support for urban bay action teams, changes to allow for stormwater permitting required by EPA, a solid waste/sludge disposal study, data management requirements, a long-range plan to improve enforcement, additional resources for the pretreatment program, and enhanced technical assistance for dischargers.

Contaminated Sediments and Dredging

Toxic contaminants accumulate in sediments in the Puget Sound basin, causing harm to bottom-dwelling organisms and threatening the rest of the food web. Dredging to maintain navigation channels spreads and relocates these sediments.

This program includes: (1) classifying sediments that cause adverse biological effects; (2) implementing Soundwide controls on sources of contaminants causing sediments to fail the sediment standards; (3) providing rules and sites for disposal of dredged materials; and (4) expanding the Urban Bay Action Program to provide for additional source control and consideration of cleanup actions for existing areas of high sediment contamination levels.

There are several changes to the program. The recommendations of phase II of the Puget Sound Dredged Disposal Analysis are adopted by reference, providing a system for unconfined open water disposal of dredged material in both north and south Puget Sound. The effort to clean up contaminated sediments includes several changes to: clarify the Department of Ecology's lead role, strengthen the involvement of tribal and local governments and the Department of Natural Resources, and have the Puget Sound Estuary Program Management Committee review priority lists and urban bay action plans.

Stormwater and Combined Sewer Overflows

Stormwater runoff is a pervasive pollution problem. As urbanization of the Puget Sound basin continues, the problem is likely to increase. The program in the 1989 plan included: (1) development of stormwater programs in urbanized areas of Puget Sound in a phased program starting with the largest cities; (2) requirements for all cities and counties to develop operation and maintenance programs, adopt ordinances for new development, and develop stormwater education programs; (3) development of stormwater controls for state highways and federal facilities; and (4) requirements for all cities with combined sewer overflows in the Puget Sound basin to develop and implement plans providing for the greatest reasonable reduction of CSO events.

Additions to the stormwater program include a workgroup to coordinate policy issues among fisheries, stormwater, and wetlands programs and a stormwater technical assistance service for local governments which would be provided by the Department of Ecology and coordinated with local governments. The program proposes that the local stormwater programs be incorporated into the comprehensive plans to be developed under the new Growth Management Act. Ecology will adopt a rule which sets minimum stormwater standards for new development, and the Authority will adopt a rule which requires that local governments adopt the stormwater programs which include standards set in Ecology's rule.

Laboratory Support

Many of the plan's programs depend on accurate and timely laboratory analyses. This program is essentially the same as the program in the 1989 plan. The program includes: (1) establishing a laboratory certification program administered by the Department of Ecology; (2) assuring that adequate laboratory support exists for agency and other sampling programs; (3) developing, updating, and encouraging the use of protocols and guidelines to standardize data collection, analysis, and transfer within Puget Sound; and (4) developing and encouraging the use of uniform quality assurance guidelines for data collected under all Puget Sound programs, including formation of a quality assurance/quality control working group.

Chapter 1. Introduction



Puget Sound is an extraordinary natural resource. Its deep waterways support international commerce, abundant commercial and recreational fisheries, and varied wildlife habitats. The region's residents enjoy boating, beachcombing, and other activities on the Sound's waters and shorelines.

In the pattern of other waterways, the Sound is showing early symptoms of poor management. Factories and military bases, ships and sewage treatment plants, farms, forest practices, and the three million residents of the region all contribute to the growing amount of waste entering the waters of Puget Sound. A steadily increasing population in the region has led to expanding urbanization and development of many shoreline areas. Even the region's rural areas are experiencing unprecedented changes and increased development.

The Sound's urban bays show evidence of contamination from toxic chemicals: sediments forming toxic hot spots, liver tumors in bottomfish, and contamination of the sea-surface microlayer. Increasing bacterial pollution throughout the Sound has forced closure of many commercial and recreational shellfish harvest areas, and shoreline development has eliminated more than half of the Sound's natural wetlands.

By the year 2010 it is estimated that population in the Puget Sound region will be almost 4.4 million people. This represents an increase of 1.2 million people, nearly 40 per cent more than the current number. The new population flooding into the region during the next 20 years will be more than the combined 1989 populations of the state's 10 largest cities: Seattle, Spokane, Tacoma, Bellevue, Everett, Federal Way, Yakima, Bellingham, Vancouver, and Renton. As this growth occurs, water quality problems associated with development, such as waste disposal, sewage, nonpoint source (surface runoff) pollution, and stormwater, will continue to mount. Success in protecting the Sound will require a costly, long-term, dedicated effort.

The Puget Sound Water Quality Authority (the Authority or PSWQA) was restructured in 1985¹ and charged with developing and overseeing the implementation of a comprehensive management plan for Puget Sound and its related waterways.

The planning area defined by the legislature in the Puget Sound Water Quality Act (Chapter 90.70 RCW) includes Puget Sound south of Admiralty Inlet (including Hood Canal and Saratoga Passage); the waters north to the Canadian border, including portions of the Strait of Georgia; the Strait of Juan de Fuca south of the Canadian border; and all the land draining into these waters. There are 12 counties in the planning area. The terms Puget Sound, Puget Sound basin, Puget Sound region, and the Sound are used interchangeably in this document to refer to the planning area.

In establishing the Authority, the legislature found:

That Puget Sound and related inland marine waterways of Washington state represent a unique and unparalleled resource . . .

That the consequences of careless husbanding of this resource have been dramatically illustrated in inland waterways associated with older and more extensively developed areas of the nation . . .

That the costs of restoration of aquatic resources, where such restoration is possible, greatly exceed the costs of responsible preservation . . .

That utilization of the Puget Sound resource carries a custodial obligation for preserving it, and . . .

That the large number of governmental entities that now affect the water quality of Puget Sound have diverse interests and limited jurisdictions which cannot adequately address the cumulative, wide-ranging impacts which contribute to the degradation of Puget Sound.

The principal responsibility of the Puget Sound Water Quality Authority is to develop, adopt, and oversee the implementation of the Puget Sound Water Quality Management Plan. The legislature originally charged the Authority to engage in a continuing planning process through 1991 (RCW 90-70), at which time the agency was to terminate. The Authority was directed to revise the plan every two years, evaluating progress toward previous goals and addressing additional concerns. Recent amendments to the Puget Sound Water Quality Act restructured the Authority, extending it to 1995, and calling for a four-year plan update cycle following the adoption of the 1991 plan.²

The Authority's enabling legislation requires state agencies and local governments to evaluate and incorporate applicable provisions of the plan into their

1 The Authority was originally established in 1983. It consisted of 21 members appointed by the governor and was charged with identifying pollution-related threats to Puget Sound marine life, evaluating pollution threats to human health, and investigating the need for coordination among agencies responsible for protecting Puget Sound water quality. Among the recommendations in its 1984 annual report was the call for "a long-range coordinated plan . . . to protect and improve water quality throughout the Sound."

2 Additional information on the 1990 restructuring of the Authority is provided below.

policies and activities. The Authority is to propose funding mechanisms, propose new legislation as needed, and oversee the implementation of the plan.

The first Puget Sound plan was adopted on December 17, 1986, following an extensive planning process. The Authority was assisted in this process by a large advisory committee and a scientific review panel. Many public meetings and hearings were held throughout the planning process to hear from citizens in all areas surrounding the Sound. Hundreds of informal meetings and consultations were also held with interested groups and individuals in order to include as many interested parties as possible in the process.

Major issue areas selected for the 1987 plan were point and nonpoint sources of pollution, contaminated sediments and dredging, stormwater, protection of wetlands and shellfish, and education and public involvement. A section was devoted to examining the unfinished agenda—issues ranging from transboundary pollution to the impacts of air pollution on the Sound—that could not be addressed due to time and resource constraints.

The 1987 plan also called for the Authority to develop three major new programs crucial to the Puget Sound plan: (1) a comprehensive ambient monitoring program for the Sound; (2) a long-range strategy for education and public involvement related to Puget Sound; and (3) a system of priorities and funding for research.

The 1989 plan, adopted on October 19, 1988, added these three items as new plan programs. The 1987 programs were also continued with minor modifications and improvements. Changes were made to clarify program elements, to reflect funding levels and the experience gained in implementation, and to make the programs more effective.

In 1987 the federal Water Quality Act, which amended the Clean Water Act, created new responsibilities for the Authority under the National Estuary Program. The Authority was already co-managing the Puget Sound Estuary Program (PSEP) with the Region 10 office of the Environmental Protection Agency and the Washington Department of Ecology. Ecology and EPA had taken the lead in establishing this effort in 1984-1985 to bring a more coordinated approach to activities related to Puget Sound. The Authority joined in this effort upon its inception.

The EPA administrator formally designated Puget Sound as part of the National Estuary Program in March 1988. A formal agreement was reached between EPA and the state of Washington that the pre-existing management committee for PSEP would be designated as the official management conference for the National Estuary Program efforts. This means that PSEP is responsible, as are the management conferences for other designated estuaries of national significance, for developing a comprehensive conservation and management plan (CCMP) that recommends actions to restore and protect the estuary. When approved by the EPA administrator, 1991 Puget Sound Water Quality Management Plan will be the CCMP for Puget Sound. The federal government's action in this case underscores not only the value of Puget Sound, but also the need to protect and improve the Sound's water quality and resources.

The 1991 plan was originally scheduled to be the final project for the Authority, which was to cease to exist after June 30, 1991. Legislation approved by the 1990 Washington State Legislature, Chapter 115, Laws of 1990, extends the work of the Authority until June 30, 1995. This action demonstrated the state's continuing commitment to the efforts directed at enhancing Puget Sound. The

legislation can also be viewed as a recognition that the Authority's work is not yet completed.

The structure of the Authority was also changed under the new statute. Previously the Authority had nine members: seven voting members and two ex-officio, nonvoting members. The seven voting members included the Authority's chair, who also served as executive director, and a representative from each of the six congressional districts around Puget Sound. All were appointed by the governor and approved by the state Senate. The ex-officio members were the director of the Department of Ecology and the commissioner of public lands.

The Authority now includes 11 members, nine of whom are appointed by the governor. Each of the six congressional districts surrounding Puget Sound is represented by at least one member. The cities, counties, and tribes each have a representative. The director of Ecology and the commissioner of public lands or their respective designees serve as ex-officio members, and each has a vote. The director of Ecology serves as the Authority's chair.

The Authority continues as an independent agency. An executive director, appointed by the governor, selects, supervises, and manages the work of the Authority's staff. The planning cycle for the Authority will be extended to complete the next plan by July 1, 1994, coinciding with the next sunset review for the Authority.

SUCCESSSES FOR THE SOUND

During the two years since adoption of the 1989 Puget Sound Water Quality Management Plan, many federal and state agencies, tribal and local governments, businesses, and individuals have been involved in implementing the plan. Progress has been made in all of the plan's programs, despite limited funding for a number of important efforts.

Milestones and accomplishments in developing and carrying out the 1989 Puget Sound Water Quality Management Plan include:

- Several state agencies carried out essential monitoring tasks during the first year of the Puget Sound Ambient Monitoring Program (PSAMP), although some monitoring tasks could not be completed due to inadequate funding. The 1990 amendments to Chapter 90.70 RCW establish PSAMP in state law.
- The Department of Ecology adopted numeric standards for toxicants in the water column as formal state rules. This is an important step in implementing the plan's Municipal and Industrial Discharges Program.
- The joint federal and state urban bay action teams made progress in joining forces with local groups to develop plans and carry out cleanup efforts in several of the Sound's urban bays. These efforts are underway in Sinclair/Dyes Inlet, Bellingham Bay, Budd Inlet, Everett Harbor, Lake Union/Ship Canal, Elliott Bay, and Commencement Bay.
- The Authority prepared issue papers in three areas: pesticides, spill prevention, and protection of fish and wildlife habitat. The papers addressed resource and management issues and made recommendations for future actions. Draft papers were issued for public comment in September 1989. The final papers, issued in March 1990, incorporated the many comments received. These issues have been integrated into the 1991 plan.



- Local committees in each Puget Sound county ranked all of the county's watersheds to determine their priority for future watershed action programs.
- Local watershed management committees developed nonpoint source control action plans for 12 early action watersheds. These plans are designed to reduce or prevent nonpoint source pollution from agricultural practices, on-site septic systems, stormwater, forest practices, and other nonpoint sources. This effort involved cooperation among local and tribal governments, agriculture and business groups, citizen and environmental organizations, and state and federal agencies. This effort was funded through the Centennial Clean Water Fund (cigarette tax) and was assisted by the federal/state Puget Sound Cooperative River Basin Study Team.
- The State Parks and Recreation Commission, working with the Boaters Task Force, developed legislation providing a funding source for the installation of sewage pumpout facilities, boating safety activities, and boater environmental education. This bill was submitted and passed during the 1989 legislative session. State Parks also installed pumpout stations at Mystery Bay and Blake Island State Parks, and continued implementation of its boater environmental education program.
- Ecology improved its regulation of point sources of pollution, funded by increased discharge permit fees for municipal and industrial dischargers. Ecology is strengthening discharge permits, especially in the control of toxicants. Ecology prepared a permit writers' procedures manual to assist this effort.
- Ecology issued interim standards for classifying sediments having adverse effects. These standards will be used as the goal for sediment quality in implementing the plan's program for point and nonpoint sources, stormwater, and combined sewer overflows, in managing the disposal of dredged sediments, and in locating areas with contaminated sediments in need of cleanup.
- Local governments have taken many steps towards water quality protection. These include, among others, creating local stormwater utilities to both plan for and finance stormwater management programs. Jefferson County has a revolving loan fund for financing septic system upgrades, and King County has approved a sensitive areas ordinance.
- Ecology initiated a wetlands preservation process that included developing criteria for wetlands to be preserved and soliciting nominations of wetlands for preservation through government acquisition. Almost 100 wetlands were nominated. The state Department of Natural Resources has committed state funds to Snohomish County to acquire portions of the Snohomish Delta wetlands. Ecology, EPA, and King County have collaborated on a demonstration wetlands acquisition project.
- The state Department of Health has inventoried almost 150 recreational shellfish beds, established a schedule for recreational shellfish monitoring, and initiated sampling at over 70 sites. The state Board of Health has adopted regulations that govern the recreational harvest of shellfish. Seven early action shellfish watershed programs are in place around the Sound as part of the nonpoint source pollution program. The goal of all

these efforts is to prevent the contamination and closure of additional commercial and recreational shellfish beds.

- The Authority has been working with other agencies and groups to establish the Puget Sound Foundation, a public nonprofit corporation which will help coordinate and fund research and education efforts related to Puget Sound. The 1990 amendments to Chapter 90.70 RCW authorized the formation of the foundation.
- Ecology established a laboratory certification program to assure credible water quality data and test results.
- Puget Sound research priorities have been identified and steps have been taken to establish communication between researchers and resource managers. Several conferences and workshops on Puget Sound have been sponsored by the Puget Sound Estuary Program and others. Topics have included research on Puget Sound, a briefing on sediments in Puget Sound, the status and management of Puget Sound's biological resources, and the significance of sea-surface microlayer contamination.
- The Marine Plastic Debris Task Force developed a state action plan in December 1988 to address the growing marine debris pollution problem in the waters of Washington. The three priorities of the action plan are: public outreach and education, environmental monitoring, and evaluating the need for legislation. The legislature enacted RCW 79.81 establishing DNR as the state's marine plastic debris coordinating agency and providing funding for a coordination program.
- The Public Involvement and Education Fund (PIE-Fund) is completing its second biennium. As of June 1990, 101 projects have been funded using about \$2 million from the Centennial Clean Water Fund. Forty-seven of these model projects have been completed, and 54 are still underway. The projects involve efforts by grassroots organizations, schools, local and tribal governments, and trade associations to educate and involve people in protecting Puget Sound water quality. Of the 47 projects funded in the first biennium, 36 have continued with other sources of funding. Results from the early projects show they reached 1.5 million people and involved 998 organizations and 2,950 volunteers.
- The Corps, Ecology, DNR, and EPA fully implemented the Puget Sound Dredged Disposal Analysis. This includes identification of open-water unconfined disposal sites, development of sediment evaluation criteria, and development of site management plans.

These and other successes in protecting Puget Sound have occurred as a result of the combined efforts of a broad spectrum of Puget Sound area residents. Significant obstacles have also hampered or slowed implementation activities.

CONSTRAINTS AND STRATEGIES

A review of laws and programs affecting Puget Sound water quality undertaken for the 1987 Puget Sound plan concluded:

Laws, programs, and agencies already exist to control many of the principal pollution sources and to protect wetlands and shellfish areas. If existing laws and programs are effectively implemented, only a few new laws or programs might be needed to complete a comprehensive

management program for protection of Puget Sound's water quality and resources.

More recently, a survey of local governments to evaluate their water quality programs (plan element NP-9) indicated that existing laws provide adequate statutory authority for local governments to protect water quality. The task for the Authority is thus largely one of being the facilitator and initiator—getting the implementing agencies to take actions which they are in fact already authorized or directed to do.

There are three major types of constraints to implementation of the Puget Sound plan: (1) inadequate funding levels; (2) legal issues; and (3) complexities and controversies.

The 1991 plan has incorporated strategies to respond to each constraint. A discussion of the constraints and strategies follows.

INADEQUATE FUNDING LEVELS

State Funding

Inadequate funding has been a critical problem for plan implementation. The Authority estimated the cost of implementing the 1987 plan during the 1987-1989 biennium at about \$37 million for the two-year budget cycle. However, funding was limited to about \$27 million for that period. The 1989 draft plan was projected by the Authority to cost \$88 million during the 1989-1991 biennium. This amount was reduced to a \$54 million request for the final 1989 plan, \$27 million of this from the state general fund. Only about \$36 million was made available for the implementation of the 1989 plan including \$14 million from the state general fund.

To address the problem of funding shortfalls, the Authority convened the Puget Sound Finance Committee in 1988 to prepare a study on long-term financing options. The committee's final report, "Funding the Cleanup and Protection of Puget Sound," was released in December 1989.

The report summarized the funding problem:

Because of chronic funding shortfalls, many of the plan's programs are only partially funded or have been put off into the future. Funding available in 1989 to carry out the Puget Sound plan totals about \$15.1 million. Annual funding needed as of 1994 to carry out the plan is \$54 million. Hence, there is a need for \$38.9 million/year additional funding for state agencies and local governments by 1994.

Funding shortfalls have been very apparent during the implementation of the Puget Sound plan. Many of the plan's programs have only been partially funded or have been put off into the future. Examples cited by the Finance Committee include:

- The research and education programs have virtually been put on hold.
- The monitoring program has only been partially funded. Funding is available for some of the sediment, fish, shellfish, and water monitoring, while

there is no funding for monitoring of bird and mammal populations, near-shore habitats, and sediment and water at river mouths.

- While new discharge permit fees are funding many activities related to discharges from industries and sewage treatment plants, these fees are not yet sufficient to fund staff to strengthen the discharge permits and to increase the frequency of compliance inspections to adequate levels.
- Very little funding has been available for identifying and dealing with toxic sediment hot spots.
- There will be significant delays in the stormwater program for urban areas.
- Wetlands acquisition and restoration have been and will continue to be limited by funding.

Additionally, there have been insufficient funds to conduct technical assistance and outreach programs, which can greatly benefit local and tribal governments in implementing their portions of the plan.

In the 1987-89 biennium, the state Office of Financial Management reserved a sum of new money for implementation of the 1987 plan. This money was allocated to the various implementing agencies. According to a Legislative Budget Committee (LBC) staff report released in January 1990, "The practical result of this was that plan implementation did not compete with other priorities within the individual implementing agencies."

This changed for the 1989 plan. Total funding was essentially held to the 1987 level, and there was no coordinated process to bring together the overall Puget Sound plan budget. According to the LBC report, this fragmentation of the budget for plan implementation meant that the plan essentially got lost in the face of competing priorities within implementing agencies. In addition, legislative appropriations have often not specified certain amounts for plan implementation, and it has been very difficult to track plan-related expenditures within implementing agency budgets.

Local Funding

The Puget Sound plan calls for significant local government participation to achieve the plan's goals. Local governments play a major role in three of the plan's programs:

- Nonpoint source pollution control programs, including development and implementation of watershed action plans and on-site septic system programs
- Stormwater management programs
- Wetlands protection programs

Local governments require a long-term commitment of staff and resources for these programs. The Puget Sound Finance Committee estimated that the 1994 plan budget shortfall for local government would total \$21 million. Many local governments have indicated that their financial resources are already stretched thin.

As part of the Nonpoint Source Pollution Program in the 1989 Puget Sound plan (element N-9), many local governments evaluated their water quality-

related programs, including land use, on-site septic system regulations and programs, zoning, shoreline master programs, and health regulations.

Local governments all agreed that a primary obstacle to their effectiveness in protecting water quality was a lack of funding. An Authority report based on the local government survey stated:

The biggest issue the Authority should address in the 1991 plan is funding. Grant funds [Centennial Clean Water Fund] are typically available only for specific projects, plans, or geographic problem areas and are rarely provided for such *ongoing* needed activities as enforcement, monitoring, and education.

If local water quality programs are to be fully implemented, alternative sources of funding may well be required for local government.

Federal Funding

The Puget Sound Estuary Program has received funds from EPA under the National Estuary Program (NEP), as authorized by Section 320 of the Clean Water Act of 1987, to support the development of a CCMP for Puget Sound. The total amount has ranged from \$1.3 million to \$2.4 million annually. These federal dollars have been used to fund special technical studies, the development of management tools, assistance in developing the ambient monitoring program, and other activities supporting the development of the Puget Sound plan. Approximately \$500,000 of the total NEP support has been for action demonstration projects, selected on a competitive basis according to criteria established by the national program. Upon completion and approval of the Puget Sound plan as the CCMP, this federal support is scheduled to drop to a base level of \$300,000 per year beginning in federal fiscal year 1991. Larger amounts of federal funds are not expected to be available through the NEP unless Congress approves legislation and appropriates the necessary funds to expand the federal role and support beyond the development phase of the CCMP.

STRATEGIES TO SECURE MORE FUNDING

State Funds

The 1991 plan states the budget requirements for its implementation. For the first time, the governor's budget request contains a consolidated budget request for the Puget Sound plan. This consolidated budget, called for in the 1990 amendments to Chapter 90.70 RCW, will make it significantly easier for the legislature to consider funding proposals and to monitor the allocation and expenditure of funds in implementing the plan.

State funding for plan implementation will potentially increase in several areas. First is the National Pollution Discharge Elimination System (NPDES) and state waste discharge permit programs. Under element P-4.1, Revised Permit Fee Rule, the plan states, "As specified in RCW 90.48.464, fees shall be established in amounts to fully recover and not to exceed expenses incurred by Ecology" in administering the permit program. The current fees are not raising sufficient funds for the program. State general fund resources have been used to subsidize the deficit. When Ecology increases these fees, more money could be made available for implementation of other plan programs.

Another source for additional state funds is the Toxics Control Accounts set up under Initiative 97, approved by voters in November 1988. These funds are appropriate for use in cleaning up toxic "hot spots" and in conducting educational programs for nonpoint source pollution control and the proper use and disposal of household hazardous wastes. These funds have been increasing in amount as the program is being phased in.

This plan also includes a request for new state funding sources recommended by the Puget Sound Finance Committee. The Authority has developed a proposal for two new funding sources for the 1991 state legislature: a motor vehicle manufacturers' fee and a tax on commercial marine fuels (see the Estuary Management Program in Chapter 3.)

Local Funds

The Authority is committed to continued work with local governments to provide information on funding sources and support efforts to secure funding. The Authority has distributed a draft of the *Local Government Water Quality Finance Guidebook* to local governments. The guidebook, prepared for the Authority with EPA funding, is meant to assist local governments in funding their Puget Sound water quality activities. The Authority will also seek additional state and federal resources for direct use by local programs.

Federal Funds

Section 320 of the federal Clean Water Act of 1987 states that funds authorized under Title VI, the state revolving loan program, and under Section 319, the nonpoint source management program, may be used to assist states with the implementation of CCMPs, such as the Puget Sound plan. The Section 319 funds are to be used by states to develop and implement nonpoint pollution management programs. The state Department of Ecology has adopted the Puget Sound plan's nonpoint source pollution program as the Section 319 program for the Puget Sound region. Proposals for the use of Section 319 funds are developed by Ecology and submitted to EPA, although the money is intended to be made available to both state and local nonpoint pollution management efforts.

The 1991 plan addresses the need for better coordination regarding these funding requests through the Section 319 program, including the need to make some Section 319 money available to the local jurisdictions developing watershed management plans. This process is intended to assist the implementation of these plans in the quickest and most effective way possible.

The U.S. Fish and Wildlife Service has established a Puget Sound Estuary Program which is funded with at least \$200,000 for federal fiscal year 1991.

Tribal governments plan to seek funds from the Department of Interior's Bureau of Indian Affairs for plan implementation by tribal governments. As co-participants in the Puget Sound Estuary Program, EPA and the Authority will assist the tribes in these efforts.

The Authority is working with the Washington State Congressional delegation to seek a line item appropriation for Puget Sound programs.

LEGAL ISSUES

The legal issues which have impeded plan implementation are largely questions regarding regulatory authorities created by Chapter 90.70 RCW. During the development of regulations implementing the plan's wetlands and stormwater

programs, questions have arisen regarding the legal status of the plan requirements. The questions concern whether the Puget Sound Water Quality Act (Chapter 90.70 RCW) and other environmental statutes grant the Department of Ecology sufficient statutory authority to require local governments to implement regulations.

For example, Ecology worked with local governments, and others, to develop standards for wetlands protection under program element W-4. These standards were to be the minimum requirements for local wetlands protection programs. In December 1989, however, the attorney general's office issued a formal opinion on the wetlands program. The attorney general concluded, among other things, that while Ecology has the authority to develop regulations pertaining to wetlands protection, it does not have the authority to require local governments to develop programs that incorporate the department's rules. This opinion effectively placed the implementation of the wetland rules on hold.

Recently, similar concerns were raised concerning Ecology's ability to require local governments to develop stormwater programs. Ecology spent two years developing comprehensive stormwater regulations for local government. But an informal attorney general's opinion stated that Ecology can create regulations and policies regarding local stormwater programs, but it cannot require local governments to adopt them.

STRATEGIES TO OVERCOME LEGAL ISSUES

One possible strategy to overcome these legal constraints is the Authority's adoption of the plan, as a whole or in part, as a rule. The attorney general's informal opinion on stormwater stated that this was a possible course of action.

Another way to overcome the legal constraints is to revise the plan to integrate with the recently adopted Growth Management Act (Chapter 17, Laws of 1990, 1st ex. sess., SHB 2929). For example, local governments required to prepare comprehensive growth management plans under the Growth Management Act can use the plan's wetlands protection standards that can be used as they prepare their development regulations.

COMPLEX AND CONTROVERSIAL ISSUES

This third type of constraint to plan implementation is broad in scope. It concerns issues that result from the comprehensive nature of the plan, from resistance to specific actions implementing the plan, and from a general lack of awareness concerning the causes of harm to Puget Sound.

Pollution is caused by everyone in the Puget Sound region; everyone is a discharger to the Sound. Actions that are taken everyday, or the infrastructure that has been developed to allow these actions to occur, result in potentially toxic or hazardous effluent finding its way to the Sound. Ideally, everyone should be willing to do his or her part in cleaning up the problems created. However, people often resist regulation and restrictions intended to prevent pollution. Businesses object to stricter discharge permits and technology requirements. Homebuilders and developers dislike additional requirements for permits and mitigation. Residents protest the increased costs of sewage treatment, septic system fees, and utility districts. Who will pay for these efforts, and how much?

Delays Resulting From Complex Issues

The Puget Sound Water Quality Authority's primary legislative mandate is to prepare and adopt a comprehensive Puget Sound water quality management

plan. Endeavoring to carry out this mandate, in and of itself, raises issues of complexity and controversy. The plan must be exhaustive in terms of confronting all aspects of the problems facing water quality in Puget Sound. This requires linking together a broad range of issues that can all negatively affect the Sound. But this approach can also lead to debate on how to develop appropriate strategies for protecting the Sound. The debate can encompass issues concerning the range of scientific certainty, the difficulty of balancing environmental protection benefits and costs, and the most advantageous method for attaining the agreed-upon water quality goals.

The complexity of the issues addressed by the plan has resulted in delays in setting standards. One example of this is the debate over establishing sediment standards under element P-2. These standards are viewed as critically important since they will be used in implementing the Municipal and Industrial Discharges Program, the Stormwater and Combined Sewer Overflows Program, and the Nonpoint Source Pollution Program. Much of the debate has focused on the appropriate method for deciding what level of a particular substance in sediment poses a threat.

Resistance to Specific Actions Implementing the Plan

Businesses, local governments, and the general public have expressed concerns about the regulations and enforcement activities that accompany plan implementation. The primary concerns are that regulations developed as a result of the Puget Sound plan will result in increased costs for compliance and longer time periods for project completion.

The sediment standards again provide a case in point. Businesses are concerned about the anticipated costs of reducing discharges and about how the standards will be applied. A primary concern is liability for the cleanup of existing toxic sediments.

Municipal and industrial dischargers, who already must obtain permits under the National Pollutant Discharge Elimination System (NPDES) of the federal Clean Water Act, are concerned that stricter permits and higher permit fees will increase the cost of doing business. This increase will be reflected in an increase in the costs to consumers.

Lack of Awareness of Puget Sound's Sensitivity to Harm

The protection of Puget Sound depends on the actions of federal, state, local, and tribal governments, businesses, citizens' groups, and the general public. Unfortunately, many people don't understand the close connections among water quality, wetlands, stormwater, sediments, household hazardous waste, and fish and wildlife habitat. Implementing agencies thus might not appreciate the importance of pursuing water quality as part of a comprehensive effort. Citizens and businesses that are subject to regulations under the plan might argue that they are unreasonable and burdensome.

In the survey of local government water quality programs (plan element NP-9), respondents found that a lack of public understanding and public education programs created a major program gap. The local government officials surveyed would like to see more money spent on education and outreach.

STRATEGIES TO OVERCOME COMPLEX AND CONTROVERSIAL ISSUES

Resolving this constraint presents a challenge: affected parties must regard the plan as reasonable, and the costs must be distributed fairly.

The Authority decided early in the planning process for the 1987 plan that an open and inclusive planning process was crucial to the success of the Puget Sound plan. The Authority has made an effort to keep the public aware of progress toward the development of the plan and to respond to public comment. The Authority's new authorizing legislation (Chapter 115, Laws of 1990) required the 1991 planning process to be even more inclusive and thorough. In addition to a draft plan, there was another round of public comment on a proposed final version of the plan.

To avoid distorting the original intent of the plan during implementation, Authority staff must work with agencies and the private sector in developing rules and regulations for plan implementation. Authority staff consult regularly with state and local government staff, constituency groups, and others about plan implementation. During development of each plan, consultations focus on ways to make the plan more effective. The Authority seeks a cooperative relationship with other agencies developing water quality rules.

Another way to overcome the complexities of the plan is through increased technical assistance. The 1991 plan increases technical assistance, particularly for the nonpoint and education programs. The increase responds to the NP-9 survey of local governments, which indicated that much more technical assistance was needed for plan implementation activities.

The plan's reasonableness and equity is enhanced through individual plan elements. For example, the discharge permit enforcement (element P-8) establishes a tiered monitoring system. If initial sampling discloses no problems, a reduced monitoring schedule may then apply. Likewise, if initial sampling indicates the possibility of problems, a more frequent and/or more comprehensive monitoring schedule would apply.

Finally, two major strategies address the general lack of awareness concerning problems facing Puget Sound: (1) increase public education and involvement; and (2) add to our technical information base and specific understanding of Puget Sound, its water quality, and aquatic resource problems. Both of these approaches are included in the 1991 plan. They expand and strengthen existing efforts in these areas.

Public Education and Involvement

Public education and involvement are critical to the success of the plan. Education can increase people's understanding and possibly lead to greater support for the various activities called for to carry out the plan. Education and public involvement activities have a multiplier effect: people connect what they learn to other situations involving water quality, and people talk to one another so the information spreads. This information exchange can change people's behavior related to water quality and also prepare them to become more involved in the decision-making process.

The 1991 plan continues to emphasize the importance of public education and involvement in each of the plan programs. The highly successful Public Involvement and Education Fund (PIE-Fund) is continued. In addition, funding is sought for efforts to educate and provide technical assistance to people regarding waste reduction, integrated pest management, household hazardous wastes, and construction and maintenance of on-site septic systems, among others.

Funding is also being sought to fully implement the long-range education strategy, elements EPI-1 through EPI-9. This strategy is intended to: (1) inform, educate, and involve individuals, groups, businesses, industry, and state, local, and tribal governments in the cleanup and protection of Puget Sound; (2) increase understanding of the Sound's ecosystem; and (3) create the kind of commitment that will be necessary to sustain efforts to improve and protect water quality over the long term.

Expanding the Information Base On the Sound

Expanding the information base is an important step in ensuring the preservation and enhancement of water quality in Puget Sound. Increasing our understanding of the problems facing Puget Sound will help pave the way toward more successful plan implementation. As more becomes known, this new information will be conveyed to the general public. Research can also provide information for dischargers on the rationale for water quality programs and regulations.

The Puget Sound Ambient Monitoring Program (PSAMP) is intended to provide information over time on the environmental conditions and resources of Puget Sound. The program's information will help water quality managers determine where the Sound is improving or deteriorating, as well as the effectiveness of specific efforts to improve water quality. PSAMP, a cooperative effort among several agencies, was first established through the 1989 plan. The 1990 amendments to Chapter 90.70 RCW (Chapter 115, Laws of 1990) provide statutory authority for PSAMP. The Authority will continue to work with other agencies in managing the ambient monitoring efforts through PSAMP.

The Puget Sound Research Program is intended to work alongside PSAMP in supporting research on the Puget Sound environment. It was established through the Authority to serve as the regional focal point to set research priorities, sponsor research, and disseminate research findings related to Puget Sound and its watersheds. Additional funds for this program are being sought.

Finally, Chapter 115, Laws of 1990, authorized the Authority to establish the Puget Sound Foundation, a nonprofit public corporation. The Foundation will promote coordination and support of research and education activities that address the cumulative effects of human activities on the Puget Sound ecosystem. Another element of the foundation's work will help make research results available to decision makers for use in developing policies and programs.

COORDINATION OF WATER QUALITY AND OTHER PLANNING ACTIVITIES

The most important goals for the Puget Sound plan are to prevent pollution and to protect the Sound's biological resources. This is particularly true in cases of toxic contamination and irreversible damage, such as habitat destruction and wetland loss. The challenge in achieving these goals is to gain the cooperation of all of the necessary governmental entities, industrial interests, and the general public in achieving the intent of the plan.

In order to succeed at this task, the Authority must coordinate its efforts with other planning activities. Coordination is becoming more important as we learn more about the interconnectedness of water quality and other concerns, such as growth management. As more is learned, it will be difficult to separate water quality issues from other environmental issues such as air quality, growth management, and hazardous waste reduction.

The Authority has been involved in a number of coordinating efforts with other planning programs on issues that affect the overall water quality of Puget Sound.

Puget Sound Dredged Disposal Analysis

The Puget Sound Dredged Disposal Analysis (PSDDA), a cooperative effort of the U.S. Army Corps of Engineers, EPA, the state Department of Natural Resources, and Ecology, developed new evaluation procedures and established new sites for the unconfined open water disposal of dredged material in Puget Sound. PSDDA also improved the permitting process and formulated plans for management and monitoring of disposal sites. In 1986 the Authority deferred the major consideration of these issues to the groups conducting this analysis and later adopted their recommendations into the plan.

Timber/Fish/Wildlife Agreement

The Timber/Fish/Wildlife Agreement (TFW) was forged between state agencies, tribes, the timber industry, and environmental groups in 1986. The agreement regulates forest practices in order to mitigate the effects on fisheries and wildlife resources. The agreement is implemented through a cooperative effort involving an assessment of the effects of forestry activities on particular sites before timber is cut.

The Puget Sound plan endorses TFW. Recognizing that state law preempts local action on forest practices, watershed action plans under the Puget Sound plan that include forest practices are to be closely coordinated with the TFW agreement.

Northern Puget Sound Marine Sanctuary

The National Oceanic and Atmospheric Administration (NOAA) is working under legislation passed by Congress in 1988 to consider making the waters of northern Puget Sound a national marine sanctuary. The agency has selected an advisory committee and eight working subcommittees to help study northern Puget Sound as a possible site for a marine sanctuary. The study phase of the project includes determining possible sanctuary boundaries, drafting an environmental impact statement and management plan, and assessing the need for regulation. The Authority, through the Public Involvement and Education Fund (PIE-Fund), has contracted with Friends of the San Juans to involve the public in the evaluation of the marine sanctuary proposal.

Environment 2010

Environment 2010 is a comprehensive, long-range planning effort which has identified major environmental challenges facing the State of Washington. The process was formally established by Governor Booth Gardner through Executive Order 88-09 on December 15, 1988.

The first phase of Environment 2010, which culminated in November 1989 with the release of the State of the Environment Report, entailed a thorough assessment of the current and likely future condition of Washington's environmental resources. A Technical Advisory Committee analyzed the human health, ecological, and economic risks posed by 23 different threats to these resources, ranging from air pollution to wetlands destruction to oil spills. A Public Advisory Committee set priorities for environmental action by comparing the Technical Advisory Committee's assessment of environmental risks with their own vision. From this process 12 challenges—12 issues that must be addressed if we are to get from where we are environmentally to where we want to be—have taken shape, and are discussed in the Environment 2010 Action Agenda presented to the governor in July 1990.

With the motto, "Everybody lives downstream," Environment 2010 addresses the challenge of clean water as one of the top priorities in Washington. Key recommendations are stated in the agenda report for controlling nonpoint and point source pollution, protecting groundwater, and protecting drinking water supplies. Additionally, the agenda addresses the challenges of wetlands protection, fish and wildlife habitat enhancement and protection, pesticide management, and environmental education, which are all part of the Puget Sound Water Quality Management Plan. Authority members and staff have participated in the Environment 2010 process to ensure coordination.

Growth Strategies Commission

The Growth Strategies Commission (GSC), convened by Governor Booth Gardner in August 1989, was charged with recommending ways to preserve the state's environment and quality of life while maintaining steady economic growth for all its region. The Commission examined problems posed by poorly managed development on water quality. The portions of the Puget Sound Water Quality Authority Management Plan that are most affected by growth include: stormwater control, wetlands protection, nonpoint source discharges, and habitat loss.

The GSC's final recommendations were submitted to the governor in September 1990. Crucial areas addressed in the report were: protecting the environment; sharing economic prosperity; making cities more livable; linking land use and infrastructure planning; how state and local government should plan together; and the state's oversight role and dispute resolution in growth management. Within these recommendations, the stormwater, nonpoint, and wetlands programs in the Puget Sound plan are necessary components of successful growth management strategies and may significantly mitigate growth. Home construction, transportation policy, development density, and air pollution can all have direct and adverse effects on water quality.

The Commission proposed that all state agencies be required to plan in conformity with the growth strategy goals. Authority members and staff have worked with the GSC to ensure coordination in meeting what are, in many instances, similar goals.

Growth Management Legislation

The 1990 state legislature approved the Growth Management Act (Chapter 17, Laws of 1990, 1st ex. sess., also known as SHB 2929) requiring the state's fastest growing counties to prepare comprehensive growth management plans. The Authority's efforts coincide with the legislation's growth management strategy. The Authority's planning efforts in the nonpoint, stormwater, wetlands, and habitat programs will play a role in any growth management strategy developed on the local level.

The Authority has worked closely with the Department of Community Development (DCD) to ensure that implementation of the Growth Management Act is coordinated with plan requirements and implementation. An Authority staff person has served on a technical advisory committee to help classify agricultural, forest, and mineral lands, and critical areas under the act. Elements W-5, in the Wetlands Protection Program, and H-1, in the Fish and Wildlife Habitat Protection Program, state that the Authority shall coordinate with DCD on wetlands and habitat protection-related issues.

States/B.C. Oil Spill Task Force

British Columbia and Washington began planning to improve spill prevention and response in 1988, following the *Nestucca* spill off the Washington coast. Alaska, Oregon and California joined the Task Force after the *Exxon Valdez* oil spill. The Authority has been assisting Ecology, which represents Washington on the Task Force, in developing oil spill prevention and response strategies. The final Task Force report was released in October 1990.

In element SP-4.2, in the Spill Prevention and Response Program, the Authority has adopted the States/B.C. Task Force recommendations by reference.

Future Coordination Efforts

It is important for the Authority to integrate its work with recent efforts, such as the ones discussed above. This will be an ongoing process. One likely result is that the work of the Authority may become more comprehensive than in the past. Water quality programs could increasingly be incorporated into community development master plans. Density requirements for housing, for instance, could facilitate sewer connections, thus preventing on-site septic system failures. Mandatory greenbelts or open spaces preserve and restore habitats and wetlands, which could also be useful in controlling flooding or providing treatment for runoff from highways and urban areas.

Chapter 2.

The State of the Sound



This plan, which builds on the 1987 and 1989 Puget Sound plans, focuses on reducing pollution entering the Sound and protecting the Sound's biological resources. In developing the plans, the Authority researched current scientific knowledge of the Sound's processes and the status of its pollution and resources. Following is a brief summary of important findings from the *State of the Sound 1988 Report*, with updated information where available.

ESTUARINE CIRCULATION

Puget Sound shows a characteristic estuarine circulation pattern: fresh water is lighter than saltwater and tends to flow seaward on top of the saltwater; the saltwater in the lower layers tends to flow landward. The Sound's shallow sills—along with inlets, channels, and other local conditions—disrupt this general pattern. Strong mixing caused by the Sound's strong tides occurs at the sills, recirculating some of the outflowing surface water. For instance, at the sill at Admiralty Inlet up to two-thirds of the outflowing water may become a part of the deeper layer where it will flow back into the Sound instead of exiting to the Pacific Ocean.

This recirculation of water means that contaminants are not readily flushed out of Puget Sound as was once believed. This is particularly true of contaminants that do not stay in solution or suspension but bind to sediment particles. Perhaps one to five percent of sediment particles initially in the surface waters of the Sound are carried out through Admiralty Inlet; the rest—along with contaminants they carry—are trapped in the Sound.

POPULATION AND LAND USE

The population of the Puget Sound basin is currently estimated at 3.2 million, with King County accounting for 46 percent of the 1989 estimated population. Most of Washington's population growth since 1980 has occurred in the state's largest counties, five of which border on Puget Sound. King, Kitsap, Pierce, Snohomish, Thurston, and Whatcom Counties increased by almost 400,000 people between 1980 and 1989, which accounts for 75 percent of the entire state's population growth in that time period.

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Puget Sound counties represented nine of the 10 fastest growing counties in the state for the period between 1980 and 1989. Much of this growth took place in unincorporated areas. Snohomish County had the highest rate of growth in the state (27 percent), while Island, San Juan, Thurston, and Kitsap counties also had very high rates of growth.

Between 1989 and the year 2000 population in the Puget Sound region is expected to grow by 19 percent, from 3.2 million to 3.8 million. The four central Puget Sound counties (King, Pierce, Snohomish, and Kitsap) are expected to add 1.4 million more people between 1989 and 2020.

Estimates of land use in the Puget Sound region show that intensively used urban land plus rural non-farm settlement increased by 42 percent from 1967 to 1984 (from 547,200 to 779,400 acres). These two land uses are expected to increase 65 percent by the year 2000 (from 779,400 to almost 1.3 million acres, or 15 percent of the total acreage in the Puget Sound region). Most of this intensively used land is projected to be in the central Puget Sound region.

ECONOMY AND RESOURCES

The harvest of fish and shellfish has been one of the most important human uses of the Puget Sound basin for as long as there have been people in the area. The total value of all commercial and recreational fish and shellfish in Puget Sound was estimated at \$168 million in 1986. Salmon harvests represent the bulk of the value of the Puget Sound catch. The commercial salmon catch in the Sound in 1986 was worth \$44.45 million (based on price per pound paid at the boat). The retail value of this same catch was estimated at \$131.84 million.

The popularity of recreational or sport fishing has increased over the last 15 years. The value of the 1986 sport salmon fishery was estimated at \$74.56 million (based on an estimate that people will pay \$74.16 per fishing day). The Department of Fisheries estimates that over 3.3 million pounds of clams alone are harvested recreationally each year from Puget Sound beaches, for a retail value of over \$11 million.

The marine waters of the Puget Sound basin represent an invaluable aesthetic and recreational resource for residents and tourists alike. A recent study found that one-third of all outdoor recreational activities by Washington residents involved fresh or salt water. The most popular in-state vacation destination area was the western Puget Sound/Olympic Peninsula region which was visited by 27.9 percent of all 1986 in-state vacationers.

Resident and non-resident travelers spent \$3.51 billion and supported 74,620 jobs statewide in 1986. Seventy-eight percent of these expenditures (\$2.75 billion) were made in counties bordering Puget Sound. Travel-generated employment accounted for 54,825 jobs in the Puget Sound region (73 percent of the statewide figure).

Recreational boating is clearly important to the region's economy. A study of the recreational marine boating industry in Washington estimated that in 1986 direct and indirect boating sales generated \$895 million and \$2.4 billion, respectively, and provided jobs for 17,300 people statewide. The recreational boating industry in the Puget Sound area contributed at least 80 percent of this total.

Puget Sound's maritime industry also plays a key role in Washington state's economy. The Sound includes major port facilities, including some of the most active ports in the world. The value of waterborne commerce on Puget Sound in 1989 totaled \$40 billion.



TOXIC CONTAMINATION

Toxic contaminants represent the most acute and greatest long-term threat to the habitats and biological resources of the Sound. Toxicants reach the marine waters of Puget Sound from many sources, but the principal known sources are municipal and industrial point source discharges, stormwater runoff, pesticides from nonpoint sources, and unpermitted discharges of wastewater. Air pollutants also contribute to toxicants accumulating in the Sound. In addition, the dredging and disposal of contaminated sediments can disturb and redistribute these materials. The accumulation of toxicants in sediments and the resulting damage to natural populations is one of the most significant problems in Puget Sound.

Toxic contaminants bind to particles and largely remain in the sediments in the Puget Sound basin rather than being flushed out to open ocean waters. Many toxic substances tend to persist in the environment; thus contamination is not easily reversed.

Concentrations of PAHs (polyaromatic hydrocarbons; primarily derived from burning of fossil fuels) in sediments in central Puget Sound are currently less than half of the peak concentrations from the 1950s, but are still about 15 times higher than the baseline levels from the 1880s.

Concentrations of toxicants in surface sediment in parts of the Sound's urban bays are elevated 100 times over the levels in the cleanest rural bays. High concentrations of toxic contaminants in sediments have been associated with high prevalences of fish diseases and other adverse biological effects.

Groundfish in contaminated areas of Puget Sound have been found to have abnormalities such as fin erosion and liver lesions, including liver tumors. Liver tumors in English sole have been found in as many as 18 percent of the fish population in certain urban bays, and pre-tumors have been found in as many as 36 percent of the fish population. In the Sound's non-urban areas these figures are about one and four percent, respectively.

More than half of female English sole tested in Eagle Harbor, and almost 40 percent of those tested in the Duwamish Waterway, failed to mature sexually and could not reproduce. Both of these areas have high levels of aromatic hydrocarbons in the sediments.

Toxic contamination of sediment and biota may become more severe as population and commercial and industrial activities increase, particularly in areas that are now relatively undeveloped. However, improvements to the National Pollutant Discharge Elimination System (NPDES) permit system (as called for by the Puget Sound plan's Municipal and Industrial Discharges Program) to better control discharge of toxicants should reduce loading of toxic contaminants. As cleaner sediments are deposited on the bottom, they will gradually begin to bury older sediments with higher concentrations of contaminants.

POINT SOURCE POLLUTION

Sewage treatment plants and industrial facilities that discharge into rivers and the Sound are considered "point source" dischargers (because they discharge through pipes at a specific point). Point source discharges (and stormwater and combined sewer overflows that are discussed below) occur throughout the Sound, but tend to be concentrated in urbanized areas. Contaminated sediments from these discharges tend to be localized in these urbanized bays and inlets. Consequently, improvements in the control of point source discharges (particularly toxic contaminant reduction) will slowly improve the quality of water and surface sediments in these areas.

Since the 1960s substantial progress has been made toward limiting conventional pollutants including bacteria, turbidity, and oxygen-demanding substances. For example, pulp mills have reduced oxygen-demanding discharges from two million pounds per day in 1969 to about 30,000 pounds per day in 1986. In addition, most sewage treatment plants in the Puget Sound area either have converted, or are working toward converting, from primary to secondary treatment. Conversion to secondary treatment will significantly reduce the discharge of many conventional and toxic pollutants to Puget Sound. The Municipality of Metropolitan Seattle (Metro) has estimated that upgrading to secondary treatment at its primary treatment plants will reduce loading of most types of toxicants to the Sound by 100 tons per year.

In the past the discharge permit system for point source dischargers has not effectively controlled the discharge of toxic pollutants into Puget Sound. A number of weaknesses were found in the regulatory program prior to the adoption of the 1987 Puget Sound plan, including discharge permits that placed limits on only a few components of the discharge, with few limits placed on toxicants; few requirements for monitoring the environment to which pollutants are discharged; and no systematic program for detecting unpermitted discharges, especially outside of the urban bays.

Largely as a result of the Puget Sound plan, the Department of Ecology is strengthening its regulation of point source dischargers to deal with some of these problems. This effort is being aided by substantial funding increases from discharge permit fees and from state general funds. However, it is still too early to see direct environmental benefits from these improved programs.

One program that has been effective at identifying and eliminating point source toxic contamination in several urban bays around the Sound has been the Urban Bay Action Program. This program has been in operation since 1985 and involves Ecology, EPA, and local agencies and organizations. Its objective is to implement an action plan for source control and promote a sense of community ownership. The action plan is developed through local, state, and federal consensus; its success depends on the degree of commitment of all the participants.

Urban bay action plans now exist for Elliott Bay, Commencement Bay, Everett Harbor, Lake Union/Ship Canal, and Sinclair/Dyes Inlets. Teams are nearing completion of plans for Budd Inlet and Bellingham Bay. Since 1985 the urban bay action teams have:

- Conducted more than 675 inspections of 282 sites and facilities;
- Assessed 48 penalties amounting to \$202,600;
- Negotiated 20 consent orders or decrees for site cleanup;
- Issued 38 warning letters, 64 notices of violations, and 41 administrative orders;
- Issued nine NPDES permits; and
- Worked with responsible industries to clean up 56 leaking underground storage tanks and have completed cleanups at 14 sites. The program has also been effective in educating the public and businesses through workshops, citizen advisory committees, and direct technical assistance.

STORMWATER AND COMBINED SEWER OVERFLOWS

Stormwater, or surface water runoff, contains a complex mixture of suspended solids, oil and grease, nutrients, bacteria, viruses, and toxic materials such as lead, cadmium, mercury, organic pesticides, ammonia, and petroleum products. Stormwater samples in the Seattle area typically exceed EPA water quality criteria for cadmium, copper, lead, nickel, and zinc. Some storm drains in Seattle were found to be the major sources of lead and polychlorinated biphenyls (PCBs) found in the sediments of Elliott Bay.

In more rural areas around the Sound stormwater runoff tends to contain fewer toxic chemicals and more fecal coliform bacteria. For example, stormwater discharging into Henderson Inlet in southern Puget Sound periodically violates state fecal coliform standards for water, and has been found to be one factor in the closure of commercial shellfish beds at the head of the inlet.

Ten cities around the Sound have combined sewers where sanitary sewage, industrial wastewater, and stormwater are collected in a single sewer system. Discharges from these systems typically contain high concentrations of fecal coliform bacteria, nutrients, and suspended sediment (with associated high levels of metals and organic toxicants). During large storms some of this combined effluent is discharged directly to the Sound without treatment. For example, in an average year Metro discharges about two billion gallons of raw sewage, untreated stormwater, and industrial effluents from about 20 combined sewer overflows (CSOs) in the Seattle area. All of the cities with CSOs are working on plans to reduce overflows, and several have begun implementing their plans.

NONPOINT SOURCE POLLUTION AND SHELLFISH

Nonpoint source pollution is typically defined as pollution that is discharged from diffuse, scattered sources rather than through pipes. Nonpoint pollution includes bacteria, sediments, nutrients, and toxicants that are picked up by rainwater and carried into streams, rivers, and eventually the Sound, or that are discharged directly into the water from boats and other water-based sources.

Sources of nonpoint pollution are numerous, varied, and difficult to detect, and their cumulative effects on water quality and habitats of the Sound can be significant.

The effects of nonpoint source pollution are experienced throughout Puget Sound. One of the more notable effects is the number of commercial shellfish growing areas that have been closed because of high levels of fecal coliform bacteria.

Some commercial shellfish beds were closed to harvest as early as the 1950s. More recent closures include harvest restrictions at nine commercial shellfish beds between 1986 and 1990. Recent monitoring of contamination levels at 10 recreational beaches found three beaches where contamination was so severe that commercial shellfish harvesting would be prohibited. This bacterial contamination originates from failed on-site sewage disposal (septic) systems, domestic and wild animal wastes, and contaminated stormwater.

In many areas bacterial contamination has increased with increasing rural development of residences and small (but numerous) noncommercial farms that use septic systems and maintain animals on their property. Since rural development is expected to continue at a high rate, nonpoint source contamination is likely to increase.

Forest practices are another potential contributor to nonpoint source pollution. Sediment loading from timber harvesting and road construction can damage

fish and shellfish habitat, and poor forest practices can introduce pesticides, nutrients, and organic debris to streams and to Puget Sound.

The Timber/Fish/Wildlife (TFW) agreement is a precedent-setting effort that was negotiated in 1986-87 by state resource agencies, timber industry representatives, tribal government representatives, and environmental groups. The agreement provides for a more holistic approach to forest practices and includes, among other things, provisions for interdisciplinary teams to inspect and approve on-site harvest plans; protection of riparian areas along larger streams; training and more emphasis on research and monitoring; and the provision for upland management areas for the use and protection of wildlife in harvested areas. Full implementation of this agreement will help protect water quality and fish and wildlife habitat in streams and rivers affected by forestry activities.

Agricultural practices can introduce a variety of nonpoint pollutants including sediment, fecal bacteria, nutrients, salts, organic chemicals, and pesticides. Programs have been developed by Ecology and the Washington State Conservation Commission (e.g., the Dairy Waste Management Program), the U.S. Department of Agriculture Soil Conservation Service (SCS), and conservation districts to manage and control agricultural nonpoint pollution. These programs generally rely on voluntary implementation of best management practices (BMPs) although enforcement of water quality standards may also be used. Examples of farm BMPs include manure storage lagoons, pasture management, stream fencing, streamside protection, and erosion control.

The overall effectiveness of these programs has been limited in the past by inadequate funding and too little attention to noncommercial farms. These small farms represent a significant, largely uncontrolled source of agricultural nonpoint pollution in the Sound.

Voluntary implementation of BMPs is increasing throughout the Sound by both commercial and noncommercial farms, and improved water quality has been found in certain areas where the majority of land owners are implementing BMPs. Puget Sound conservation districts report that in 1986 481 landowners were using some type of BMP to reduce nonpoint source pollution; 412 additional landowners used BMPs in 1987.

Failing on-site sewage disposal (septic) systems can discharge bacteria and household chemicals to groundwater, streams, and eventually to Puget Sound. Approximately one-third of the residents in the Puget Sound area are served by on-site systems. About 405,000 septic systems were operating in Puget Sound in 1987, and the Department of Health estimates the overall failure rate at 3.5 to 5.0 percent. This means that as many as 14,000 to 20,250 septic systems may have failed in Puget Sound in 1987. A recent survey of local health agencies found estimated failure rates of up to 12 percent in some areas of the Sound.

Sewage discharge from boats is a potential problem during the boating season wherever large numbers of boats congregate. Boat fueling and maintenance activities can also be sources of pollution. It is difficult to quantify direct effects of boat bacterial waste because of variations in factors such as temperature, turbidity, tides, season of the year, and the number of persons aboard each boat. A 1988 study of five marinas in bays with restricted circulation found elevated fecal coliform levels during boating weekends. These levels appeared to exceed measurements taken when few boats were present. State and local agencies are increasingly recommending the closure of recreational shellfish beds near popular boating areas and marinas.

LOSS OF WETLANDS AND HABITAT

One major environmental consequence of Puget Sound's growth has been the destruction of wetlands for agricultural, port, industrial, residential, and commercial development. Of the approximately 22,500 acres of coastal wetlands present in 1800, nearly 14,000 acres have been diked, filled, and converted to other uses. Virtually all of the saltwater and estuarine wetlands in the Lummi, Duwamish, and Puyallup deltas have been lost. In stream corridors where pastures continue to be created there has been a 50 to 60 percent loss of wetlands. In farming areas such as the Skagit Valley wetland losses are estimated to be as high as 90 to 95 percent. Commercial development in areas such as the Green/Duwamish river basin has eliminated over 95 percent of the original wetlands. A recent analysis of the State Environmental Policy Act conservatively estimated that 530 acres of unprotected freshwater wetlands are being degraded or destroyed statewide each year.

Rapid growth in the region's population (and associated development) is the greatest threat to fish and wildlife habitat. Conversion of forest lands and croplands to other uses continues to reduce both the habitat available and the quality of the remaining habitat.

As part of the implementation of TFW, the TFW Policy Group has developed an action plan that aims to improve protection of wildlife habitat by setting certain requirements for forest harvest practices. The plan calls for harvesters to leave snags, live trees, and woody debris on clearcut sites. Included in this effort is implementing a "landscape ecology" perspective to maintain a greater diversity of habitats.

Another initiative also shows promise for protecting forest lands. The Sustainable Forestry Roundtable is seeking ways to maintain a viable forest industry—in the face of growth pressures—while protecting the forest ecosystem. The Roundtable negotiations have focused on land use issues in the forests and include representatives from state agencies, the timber industry, tribes, counties, and environmental groups. The land use issues under discussion include clearcut size, designation of forest lands that are close to urbanizing areas "likely to convert," compatibility of areas of "mixed use" such as forestry and agriculture land uses; and designation of areas where forestry is the primary use as "working forests." The "landscape ecology" perspective is expanded in the Roundtable discussions to include the potential for 10 percent of the forest to be set aside for habitat protection.

ACTIONS TO PROTECT PUGET SOUND

This chapter has described a number of threats to the water quality and biological resources of Puget Sound. To protect the wealth of the Sound, the Authority has developed a comprehensive action plan that addresses these threats. The action plan follows in the next chapter.

1. Executive Summary
2. Human Development and the Sound
3. Conditions and Policy Research
4. The State of the Sound Plan

Chapter 3. Action Plan



INTRODUCTION

In the past the management of Puget Sound was handled by many different government entities with little coordination among each of their programs. Working alone and with inadequate resources and tools, these entities were unable to address the cumulative, wide-ranging impacts to water quality in Puget Sound. In 1985 the Washington Legislature created the Puget Sound Water Quality Authority, whose main purpose is to develop, adopt and oversee the implementation of a comprehensive strategy to protect Puget Sound. Now guided by this comprehensive management plan, federal and state agencies, businesses, city, county and tribal governments, environmental groups, clubs and individuals are working together to meet the challenges facing Puget Sound.

The plan was developed to fulfill the requirements of the Puget Sound Water Quality Act (Chapter 90.70 RCW) and Section 320 of the federal Clean Water Act (33 U.S.C. 1330). The state law calls for a comprehensive water quality management plan prescribing the needed actions for the maintenance and enhancement of Puget Sound water quality. The federal Clean Water Act calls for a comprehensive conservation and management plan that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected.

PLAN GOAL

To restore and protect the biological health and diversity of Puget Sound, by preserving and restoring wetlands and aquatic habitats, preventing increases in the introduction of pollutants to the Sound and its watersheds, and reducing and ultimately eliminating harm from the entry of pollutants to the waters, sediments, and shorelines of Puget Sound. In seeking to achieve this goal, federal and state agencies and local and tribal governments shall take into consideration the net environmental effect of their decisions in order to minimize the transfer of pollutants from one environmental medium to another.

The plan's emphasis on prevention recognizes the simple truth that it will cost far more to clean up pollution later than to prevent it now. The plan is based on a premise of shared responsibility among all of us in the Puget Sound region and recognizes that fish, wildlife, water, and pollutants cross jurisdictional lines. It establishes a framework based on a partnership among levels of government, each having a defined set of responsibilities in different program areas. The plan recognizes and includes actions by federal, state, local, and tribal governments, the private sector, and citizens.

CRITERIA FOR SETTING PRIORITIES

The Authority has established priorities in the 1991 plan using the following criteria. As in the past, the process of establishing plan priorities involves considering the severity of the threat posed by different problems within Puget Sound and the options for preventing or curing the problems. The main considerations that are important for this process of ranking are:

- What is the magnitude of harm for the environment and human health?
- What is the persistence of the threat and the difficulty of mitigating or resolving the problem?
- How adequate are existing management programs?
- Is there a loss that could be construed as irreversible?
- What is the impact on current uses of the Sound?
- Is the action part of an ongoing plan program?
- What is the most cost-effective approach to address a problem?

It is also important to ensure that the Puget Sound plan be comprehensive and effective. This means that good use must be made of all the existing programs, funding sources, and efforts that are already occurring. The plan must also be regionally fair. Conditions vary greatly around the Sound. In one part of the Sound, nonpoint pollution with microorganisms may be the greatest problem; in another, it may be stormwater carrying toxic compounds, and in another, loss of wetlands. For these reasons, the Authority considered these additional criteria in setting priorities for this plan:

- Are all threats to the Sound being addressed?
- Are the significant threats in each portion of the Sound being addressed adequately?
- Which programs have long start-up periods, and have these begun yet?
- What funding sources exist to implement programs and are they being fully used?

Finally, the Authority considered the following additional factors when it set priorities within programs:

- Adopting preventive tools, such as standards and procedures for discharge permits, rather than proceeding on a case-by-case basis;
- Taking actions that will have a multiplier effect;

- Taking actions that will increase the likelihood of successful implementation of the plan; and
- Following a particular sequence which is necessary to implement a program's elements.

BROAD PRIORITIES

In general, the Authority believes that it is important to complete work which has been started. Using the criteria described above, the Authority has set broad priorities for the 1991 plan. They are, in alphabetical order:

- Assess the environmental conditions of Puget Sound, its resources, and the effects of human activities on the Sound and its resources.
- Clean up existing toxic contamination where sources are controlled.
- Continue plan programs that have been started and maintain current funding levels for them.
- Control sources of toxic contaminants to Puget Sound.
- Enhance protection of shellfish beds.
- Ensure the protection of wetlands and aquatic habitat. Stop losses of wetlands and other aquatic habitat.
- Improve the control and cleanup of nonpoint source pollution in the Sound.
- Provide long-term support for research and education.
- Prevent spills in the Sound and enhance the capability to respond to spills when they occur.
- Support and improve education and public involvement programs in order to inform, educate, and involve citizens of the region and state in the cleanup and protection of Puget Sound.

PRIORITIES BY ELEMENT

In addition to these broad priorities, the Authority has delineated priorities for the plan on an element-by-element basis. The list on the following pages shows all elements in the plan which require funding during the next biennium (1991-1993) within one of four categories. These are:

- (M) high priority but has existing funding; maintain at current level
- (A) high priority for new or increased funding
- (B) medium priority for new or increased funding
- (C) low priority for new or increased funding

The Authority has further divided "A" priority elements which required increases in state general fund allocations into three groups. These group designations are included in the matrix. This matrix will guide implementation of the 1991 plan during the next biennium. The Authority may amend the list as it sees how progress is made in implementing urgent priorities and as it monitors conditions in the Sound.

THE FINAL 1991 PUGET SOUND PLAN

The 1989 Puget Sound Water Quality Management Plan provided the basis for this final 1991 plan. This plan continues (with some modifications) each of the programs in the 1989 plan. It includes new programs for estuary management, the Puget Sound Foundation, and fish and wildlife habitat protection.

The programs that follow this introduction are organized in a consistent format. Each program is prefaced with a brief statement of the problem that led to the creation of the program. This is followed by a summary of progress made in implementing the program since the adoption of the 1989 plan. This is followed by the program goal, the strategy for achieving this goal, and the elements comprising the program. Following each element is a brief status section which describes the progress in implementing that element. For each program, the major actions flowing from the program which the Authority intends to review are listed and any legislation required by the program is specified. Finally, the program's estimated cost is summarized. This chapter concludes with a discussion of the costs and proposed financing for the plan as a whole.

SEVERABILITY

If any portion of this plan or its application to any person or circumstance is held invalid, the remainder of the plan or the application of that portion to other persons or circumstances is not affected.

For the purposes of this provision, and in observing the procedural requirements set forth in RCW 90.70.075(2), plan "portion" shall refer to any of the several subelements found with the various program elements of this plan.

PRIORITIES BY PROGRAM ELEMENT

M	A	B	C
Maintain at existing level Has existing funding	HIGH priority for new or increased funding	MEDIUM priority for new or increased funding	LOW priority for new or increased funding
EDUCATION AND PUBLIC INVOLVEMENT			
EPI-8 Funding	EPI-5 Business & Industry Audience 2 EPI-7 College & University Audiences 2 EPI-2 Coordination Mechanisms 3 EPI-6 Youth Audiences 3		PI-1 Public Involvement
ESTUARY MANAGEMENT AND PLAN IMPLEMENTATION	EM-7 Shellfish Funding Strategy 2 EM-11 Attorney General Support 3 EM-14 Fed. Consistency Review Process 3 EM-6 Puget Sound Grants Program EM-10 Enhanced Local Enforcement		EM-12 MOUs with Dept. of Defense EM-13 Plan Review by Federal Agencies
PUGET SOUND FOUNDATION	F-1 Puget Sound Foundation		
FISH AND WILDLIFE HABITAT PROTECTION	H-5 Public Involvement 3	H-2 Habitat Task Force H-3 Habitat Database & Inventory H-6 Field Investigations	H-4 Habitat Education Strategy
HOUSEHOLD HAZARDOUS WASTE			HHW-2 Info. on Less-toxic Alternatives
LABORATORY SUPPORT	L-1 Laboratory Certification Program 1 L-3 Puget Sound Protocols/Guidelines 1 L-4 Quality Assurance/Quality Control 2		L-2 Laboratory Capacity
MONITORING	M-1 PSAMP Management Structure 2 M-2,4,5 Monitoring & Data Mgt. 1,2	M-3 Citizens' Monitoring	M-6 Add'l. Monitoring & Data Mgt. M-8 Pesticides Monitoring
MUNICIPAL & INDUSTRIAL DISCHARGES	P-5 Procedures Manual/Tech Assist 1 P-13 Urban Bay Action Teams 1 P-27 Technical Outreach to Dischargers 1 P-19 Training 2 P-26 Public Outreach 2 P-6,7,8,9,10 Wastewater Permits 3 P-11 Enhanced EPA-issued Permits 3 P-22 Pretreatment Enhancements	P-18 Adopt Enforcement Policies	P-16 Use of Certified Labs P-21 Felony Provisions P-23 Municipal Operator Training P-28 Ecology Reporting Requirements

M	A	B	C
Maintain at existing level Has existing funding	HIGH priority for new or increased funding	MEDIUM priority for new or increased funding	LOW priority for new or increased funding
	P-14 Inspections P-17 Data Management		
NONPOINT SOURCE POLLUTION			
NP-3 Watershed Management Committees	NP-2 Guidelines for Watershed Plans 1	MB-6 Enforcement of MSD Regs.	NP-12 Certification of On-site Prof.
NP-4 Plan Adoption & Implementation	NP-5 Program Funding & Incentives 1		NP-13 Dairy Waste Management Plan
NP-10 On-site Regulations & Programs	NP-6 Technical Assistance for Plans 2		NP-14 Cost-Sharing Program
MB-2 SMP Amendments for Marinas	NP-7 Program Management 3		NP-16 Pesticide Usage Surveys
MB-3 Model Ord. for Sewage in Marinas	NP-15 Larger/Alt. On-Site Systems 3		NP-17 Pest Management Program
MB-4 Boaters Task Force	NP-8 Education Programs		MB-9 No-Anchorage Areas
MB-5 Construction of Pumpouts at Priority State Parks			
MB-7 Monitoring of Boating Areas			
RESEARCH	R-1 Puget Sound Research Program		
CONTAMINATED SEDIMENTS AND DREDGING			
S-3 Unconfined Open Water Disposal Sites	S-8 Investigations and Cleanup of Contaminated Sediment 3	S-5 Revision of Rules & Programs	S-9 Public Involvement/Education/ Technical Assistance
S-4 Sediment Confined Disposal Standards			
S-6 Multiuser Confined Disposal Sites Study			
S-7 Guidelines for Sediment Cleanup			
SHELLFISH PROTECTION			
SF-5 Annual Inventory & Info. Mgt.	SF-3 Shellfish Closure Response Strat. 1	SF-7 Public Involvement & Education	
	SF-2 Rest. & Protection of Com. Beds 2		
	SF-4 Recreational Shellfish Program 3		
SPILL PREVENTION AND RESPONSE			
SP-1.2 Policy/Contingency Planning	SP-9 Reduct. of Conflicts in Nav. Lanes 3	SP-7 Training on Art. 80 UFC	SP-6 Spill Prevention Plans
	SP-5 Implem. of States/BC Oil Spill TF Recs	SP-8 Review of State Spill Prevention Legislation	SP-10 Vessel Safety Study
	SP-11 Spill Prevention Education		SP-12 Effects of Off-shore Drilling

M	A	B	C
Maintain at existing level Has existing funding	HIGH priority for new or increased funding	MEDIUM priority for new or increased funding	LOW priority for new or increased funding
STORMWATER AND CSOs SW-9 CSO Reduction Plans	SW-1 Maintenance Programs & Ordinances 1 SW-2 Urban Stormwater Mgt. Progs 1 SW-3 Technical Manuals & Assistance 3 SW-4 Rules & Guidelines for SW Progs. 3 SW-5 Puget Sound Hwy. Runoff Prog. 3	SW-6 Runoff from Federal Facilities SW-7 Stormwater-Related Research	
WETLANDS PROTECTION W-1 Criteria Dev. & Program Planning	W-3 Wetlands Preservation 2 W-4 Enhanced Regulatory Program 2 W-8 Wetlands Restoration Program 3	W-2 Identif. of Wetlands to Preserve W-5 Interagency Coord. & Fed. Role W-6 Program for State-owned Lands	W-7 Wetlands Education Strategy

The following elements have not been assigned priorities for new or increased funding because they are not estimated to have a cost in the next biennium.

EM-1 Management Structure of PSEP no cost estimated	EPI-9 PSWQA Activities covered in the Authority budget	P-1 Adopt EPA Water Quality Criteria not scheduled for several years	SF-3 Toxicant Testing of Selected Beds costs covered in Monitoring Program
EM-2 Management Committee no cost estimated	F-2 Puget Sound Foundation Future Functions no cost estimated	P-12 Reevaluate Major/Minor Permits no cost estimated	SF-6 Funding Sources Assessment costs covered in EM-7
EM-3 Technical Advisory Committee no cost estimated	HHW-1 Phased Funding for Plans completed	P-15 Indep. Verif. of Self-monitoring deferred to future	SP-3 Spill Prevention Report completed
EM-4 Increased Funding no cost estimated	M-7 Evaluation of PSAMP not scheduled for several years	P-20 Search for Unpermitted Discharges deferred to future	SP-4 Spill Prevention Committee completed
EM-5 Impl. of Long-Term Funding Proposals no cost estimated	MB-1 Coord. of Marinas & Boating no cost estimated	P-24 Certify Industrial Plant Operators deferred to future	SW-8 CSO Reduction Guidelines completed
EM-8 Authority Oversight of Plan Implementation no cost estimated	MB-8 Study of No-Discharge Areas not scheduled for several years	P-25 Employee Education Assistance deferred to future	
EM-9 Federal Enforcement no cost estimated	NP-1 Selection of Priority Watersheds not scheduled for several years	R-2 Research Foundation covered in Foundation Program	
EPI-3 General Audiences deferred until the next biennium	NP-11 On-site Inspections and Education element deleted	R-3 Research Priorities no cost estimated	
EPI-4 Volunteer Audiences deferred until the next biennium	NP-9 Prevention completed	S-2 Unconfined Disposal Planning completed	

ESTUARY MANAGEMENT AND PLAN IMPLEMENTATION PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION



The management and protection of an estuary such as Puget Sound is a complex undertaking. The resources to be protected are as varied as are the threats they face. Federal, state, local, and tribal governments, businesses, individuals, and organizations all have roles and responsibilities. The normal separation of responsibilities among the various units and levels of government makes it difficult to take a comprehensive approach to the long-term protection of Puget Sound. Each level of government has a role to play, but these activities have not always been well coordinated. Such coordination is essential for successful and cost-effective management of Puget Sound.

In 1985 the Puget Sound Water Quality Authority was directed to develop and adopt a comprehensive management plan for Puget Sound, to be implemented by existing state and local government agencies. The Authority established ties to the Office of Puget Sound of Region 10 of the U.S. Environmental Protection Agency (EPA) and the Department of Ecology. EPA was funding special studies of Puget Sound in cooperation with Ecology and other agencies.

In March 1988 Puget Sound was designated an estuary of national significance under the National Estuary Program (Section 320 of the federal Clean Water Act). The designation agreement between the state of Washington and EPA sets out the process for developing a comprehensive conservation and management plan (CCMP) for Puget Sound. The designation agreement established the management structure for the plan development process under the Puget Sound Estuary Program (PSEP), which has been co-managed by EPA, Ecology, and the Authority. The Authority has had responsibility for preparing and adopting the CCMP for the program. The Environmental Protection Agency has provided federal funding, carried out technical studies, and overseen implementation by federal agencies. Ecology has been the lead state agency for implementation of most plan programs.

Federally recognized Indian tribes in western Washington possess important treaty fishing rights in the Sound and rivers emptying into it. The governor of the state of Washington has signed a government-to-government agreement with the tribal governments recognizing their governmental authority as co-managers

of natural resources. In Section 518 of the federal Clean Water Act, tribal governments are recognized as states for certain purposes. A seat on the Authority has been designated for tribal representatives in recognition of this important role of the tribes. The Authority will look to the tribal governments as co-managers of the resource to assist in preparing and implementing a comprehensive conservation and management plan for the Puget Sound estuary. Tribal governments will also develop their own estuary management plans for estuaries that are within or adjacent to tribal jurisdiction.

The designation agreement essentially ends when the 1991 Puget Sound plan is adopted and approved by EPA. Yet adoption of the plan is only the beginning of a long-term project to protect Puget Sound. The adoption of a comprehensive management plan will not, in itself, guarantee the protection of the Sound. A continuation of the existing PSEP management structure to oversee plan implementation, and coordinate activities for the most efficient use of scarce resources, is also required. There are too many competing priorities and divergent interests to expect easy implementation of the newly adopted federal CCMP and revised state Puget Sound Water Quality Management Plan. It is also essential for agencies and local governments responsible for implementing the plan to report back to the PSEP co-managers on their efforts so that it is possible to track progress.

Funding

Since its initial adoption in December 1986, implementation of the Puget Sound Water Quality Management Plan has been thwarted by inadequate funding. Actual funding has been far less than what is required. Each year of inadequate funding further slows the effort to protect and clean up Puget Sound.

The 1987 plan estimated that plan implementation would require \$15.7 million from state, local, federal, and tribal government for fiscal year 1988 and \$20.9 million for fiscal year 1989. Actual funding for these two years was \$10.3 million and \$16.2 million. Implementation of the final 1989 plan was estimated to require \$26.7 million for fiscal year 1990 and \$27.3 million for fiscal year 1991. Actual funding was \$19.1 million and \$19.4 million for these two years.

Each of the types of funding available for plan activities is subject to many competing demands. The state general fund must support most state government obligations, including education funding, social and health programs, and a multitude of other activities. The Centennial Clean Water Fund (CCWF), established in 1986 to support water quality activities, does not go solely to funding Puget Sound programs. Of over \$40 million a year in available funds, programs to implement the Puget Sound plan directly receive only about \$5 million, or 12 percent. As much as three-quarters of the yearly allotments of CCWF dollars go into Puget Sound basin projects, but many of these, such as the construction of secondary sewage treatment plants, are required by federal law and not by the Puget Sound plan.

Local governments are also faced with tremendous demands on their limited sources of revenues. Local governments have spent significant funds to develop watershed management plans. A number of local governments are committing significant funds to construct secondary treatment plants. Others are developing costly stormwater flow control systems. One source of plan implementation money for local governments is the state revolving fund, which provides low-interest loans to help local governments finance clean water projects. WAC 173-98-050(1)(c), adopted by Ecology, makes 10 percent of this fund available for projects that will implement a comprehensive conservation and management

plan under Section 320 of the CWA. Currently, this only applies to the Puget Sound plan.

Tribal governments also face demands in excess of their limited sources of revenues. Tribal governments have a significant number of duties mandated by federal law in the case *United States v. Washington*. Due to their relatively small tax base, tribal governments have significant need for additional funding for activities contemplated by the Puget Sound Estuary Program.

The Authority established the Puget Sound Finance Committee to study options for securing long-term funding for Puget Sound. Implementation of the committee's recommendations would provide some of the funding necessary for plan implementation. Other options for funding, including increased federal funding, should be pursued. Adequate funding is essential if the effort to protect Puget Sound is to be successful. The lesson of older, more developed estuaries is that failure to spend money on prevention now will mean far greater costs in the future.

Enforcement

Many existing laws and programs designed to protect the water quality and resources of Puget Sound are not being fully enforced. This is true not only of state and federal laws, but also of city and county ordinances regulating land use and development, such as shoreline master programs, zoning ordinances, and local health codes governing on-site septic systems. Difficulties in enforcing water quality-related programs and ordinances are experienced by most jurisdictions, usually due to competing priorities among programs, inadequate funding, or lack of expertise in developing needed ordinances or programs. Local prosecuting attorneys have difficulties enforcing environmental laws due to a lack of adequate penalties and insufficient staff.

Federal Facilities

There is a significant federal presence in the Puget Sound basin, including several major Department of Defense installations and numerous smaller facilities owned or operated by the National Park Service, the National Oceanic and Atmospheric Administration, the Environmental Protection Agency, and other federal agencies. The daily operations of these facilities are diverse and often resemble the activities of industries, businesses, farms, and households around Puget Sound, with similar effects on water quality.

For example, federal Superfund sites have been designated at several military installations around Puget Sound: Fort Lewis Army Base, McChord Air Force Base, Trident Submarine Base at Bangor, Whidbey Island Naval Air Station (NAS), and the Naval Undersea Warfare Engineering Station at Keyport. Eight of the installations have NPDES permits from EPA for industrial and/or domestic wastewater and stormwater discharges. Military bases regularly handle fuels or hazardous materials to support base missions, and spills are a potential problem. For example, each year the Naval Supply Center at Manchester handles an average of 23 million gallons of diesel fuel for ships and 123 million gallons of jet fuel. During March 1990 two spills occurred at Manchester, one of which allowed an estimated 1,000 gallons of diesel fuel to enter the Sound. Dredging occurs at some facilities in order to meet navigational needs. Contamination of the dredged sediments is a concern. Wetlands and wildlife habitat are present at some of the facilities, requiring management.

The regulatory framework for federal facilities can be complex, making it difficult to ensure compliance with environmental laws. The major federal environ-

mental laws provide that federal entities are subject to the same federal, state, and local environmental requirements as any nongovernmental entity. However, the President may exempt federal entities from environmental requirements. Complicating the regulatory scheme further is the U.S. Justice Department's position that EPA is not authorized to bring suit against other federal agencies or issue unilateral orders to them to enforce environmental laws. EPA has responded by adopting a federal facilities compliance strategy that relies on administrative mediation of disputes.

A 1988 General Accounting Office report found the incidence of noncompliance by federal facilities with priority NPDES program requirements to be twice that of nonfederal industrial facilities. A 1990 report by the National Governors' Association and the National Association of Attorneys General sharply criticized the environmental compliance record of facilities owned and/or operated by the Departments of Defense and Energy. The report urged major reforms in the regulation of federal facilities, including new legislation controlling federal facility compliance; greater independent oversight of facilities; national deadlines for cleanups; more funding for compliance; and a comprehensive waste management program for all facilities.

The Department of Defense has acknowledged the need to make environmental compliance a part of its mission. However, funding for management and cleanup activities remains in short supply and it is unclear what priority the Department gives to its environmental mission relative to other defense missions. Expected cuts in the Defense budget during the next decade could exacerbate base environmental problems, unless the Department adjusts its priorities to give greater weight to environmental programs.

The institutional structure at the bases can also hinder environmental management efforts. In many cases, environmental staff do not have the authority to require sound environmental practices basewide, such as minimizing pesticide use or rigorous training in spill prevention—practices that would prevent damage to Puget Sound.

Unfortunately, the federal funding process for environmental programs, as currently designed, can discourage preventive approaches. The major sources of funds for military environmental programs are the Defense Environmental Restoration Account (DERA) and Pollution Abatement funds. The current funding process assigns the highest priority to projects needed to address acute threats to human health or to comply with court orders or court-approved settlement agreements, and lowest priority to projects which are not currently required by law, such as preventive measures.

Other Federal Activities

Federal development projects or financial assistance programs administered by federal agencies, for example, U.S. Army Corps of Engineers navigation improvement projects, or Housing and Urban Development block grants for shoreline development, can sometimes have major effects on the Sound. U.S. Forest Service resource management activities can also adversely affect the quality of aquatic habitat. Federal permitting or regulatory programs also affect the implementation of the plan. For example, EPA Region 10 issues and enforces NPDES permits for federal facilities in the Puget Sound area. The U.S. Army Corps of Engineers administers the permit program under Section 404 of the Clean Water Act and Section 10 of the 1899 Rivers and Harbors Act. The 404 permits control filling and dredge disposal operations in waters of the

United States, including wetlands. The Section 10 permits control all structures and activities in navigable waters of the United States.

Another important federal activity is the management of oil and gas development on the outer continental shelf (OCS). The Department of Interior (through the Minerals Management Service) conducts the leasing program and manages the development of oil and gas resources on the OCS off the Washington coast. These actions may have significant effects on Puget Sound in the form of increased tanker traffic or the development of onshore support facilities. Because the federal government retains authority over so many activities that affect Puget Sound, it is essential that federal agencies cooperate with state and local agencies in implementing the plan.

The federal role in implementing the 1991 plan is particularly important, since this plan will be adopted by EPA as a final comprehensive conservation and management plan (CCMP) for the Puget Sound Estuary Program. Section 320 of the federal Clean Water Act requires each estuary program to review federal financial assistance programs and development projects for consistency with the plan.

PROGRAM GOAL

To provide adequate management, funding, enforcement, and federal consistency during the implementation of the Puget Sound Water Quality Management Plan, the Comprehensive Conservation and Management Plan for Puget Sound.

STRATEGY

The strategy for achieving this goal is to (1) formalize and continue the existing Puget Sound Estuary Program management structure; (2) obtain adequate funding for the program, including new sources of state and federal revenue; (3) require accountability by implementing agencies; (4) provide strong enforcement at all levels of government; and (5) ensure that federal activities, including the operation of large federal facilities, are consistent with the plan.

PROGRAM ELEMENTS

Management Structure

EM-1. Management Structure of the Puget Sound Estuary Program

The U.S. Environmental Protection Agency, the Puget Sound Water Quality Authority in cooperation with federally recognized Indian tribes of western Washington, and the Washington Department of Ecology shall continue to co-manage the Puget Sound Estuary Program (PSEP), as established under the provisions of Section 320 of the federal Clean Water Act as amended by the Water Quality Act of 1987.

The Puget Sound Water Quality Authority is responsible for preparing and adopting the Puget Sound Comprehensive Conservation and Management Plan (CCMP) for the program, which is also the Puget Sound Water Quality Management Plan provided for by Chapter 90.70 RCW. The Authority shall amend target dates and program tasks as necessary to ensure plan implementation and shall develop the next full revision of the plan, scheduled for 1994.

The Environmental Protection Agency provides federal funding, carries out technical studies, and leads implementation by federal agencies. EPA provides liaison with federal agencies and is responsible for oversight of programs that have been delegated to the state, such as discharger permits under the National Pollution Discharge Elimination System program.

Ecology, with state and delegated federal regulatory authority for water quality, air quality, and solid and hazardous waste, is the lead state agency for implementation of most plan programs.

The three co-managers of PSEP shall help review the activities of federal agencies as part of the federal consistency process developed by the PSEP Management Committee. This process is spelled out in EM-14.

[Status: EPA, the Authority, and Ecology began co-managing the Puget Sound Estuary Program in 1986.]

EM-2. Management Committee

The three co-managers shall continue to jointly chair the Puget Sound Estuary Program Management Committee. This committee shall be composed of representatives of key federal and state implementing agencies and local and tribal governments. The management committee will advise the co-managers, provide a formal system of communication between the co-managers and those implementing the plan, and review proposed revisions to the plan. Other duties will include approving the work plans for EPA-funded implementation activities and reviewing urban bay action plans.

[Status: The co-managers formed the PSEP Management Committee immediately after Puget Sound was designated an estuary of national significance under the National Estuary Program in 1988.]

EM-3. Technical Advisory Committee

The co-managers shall continue the Puget Sound Estuary Program Technical Advisory Committee. This committee shall be composed of scientists and technical experts, and shall choose its own chair. The Technical Advisory Committee will advise the co-managers on scientific issues and review technical studies and reports.

[Status: The Technical Advisory Committee was originally established by EPA and the Authority and has been advising the co-managers since Puget Sound was designated under the National Estuary Program.]

Funding

EM-4. Increased Funding

The estuary program co-managers shall pursue funding for implementation of the plan and related activities from all available federal, state, and local government sources as well as private sources.

EPA shall strive to ensure that federal programs that provide funding for water quality are used to fund plan activities, including related tribal programs, to the maximum extent possible.

[Status: The Authority has developed a budget for plan implementation as part of the development and adoption of each plan. EPA and Ecology have directed other funding sources to plan tasks.]

EM-5. Implementation of Long-Term Funding Proposals

The Authority shall propose legislation to establish new funding sources based on some of the recommendations of the Puget Sound Finance Committee. Revenues generated by these sources should be used for Puget Sound plan implementation and other water quality activities.

Funding options that the Authority shall include in its legislative package for the 1991 legislative session are a motor vehicle manufacturers' fee and a reasonable tax on commercial marine fuels. The rate of the marine fuels tax should be set in a manner that is sensitive to fuel prices in other West Coast ports and to the elasticity of demand for purchases of marine fuels in Puget Sound. The Authority shall work with the B.C.-States Task Force to encourage a higher and uniform marine fuels tax in all U.S. and Canadian West Coast ports.

Target Date: Propose 1991 legislation for new revenue sources by December 1, 1990. The development of additional funding proposals and work with the B.C./States Task Force shall be ongoing.

[Status: The Authority established the Puget Sound Finance Committee in 1988 to identify new and existing potential sources of funding to support the long-term implementation of the Puget Sound plan. A study, funded by the EPA Office of Marine and Estuarine Protection, was conducted in consultation with the Association of Washington Cities, the Washington State Association of Counties, tribal governments, the members and staffs of the Ways and Means Committee of the state Senate and the Revenue Committee of the state House, other legislators, the Governor's Office, citizens' groups, business associations, other relevant public and private entities, and state agencies.]

The committee focused on the year 1994, when the projected shortfall for plan implementation would reach \$38.9 million per year, computed by extrapolating 1989 spending at the state and local levels. The committee studied over 20 possible funding sources, including a variety of state taxes, the establishment of a regional fee, rate revenues, a private foundation, and increased reliance on the state general fund.

The committee recommended a financing package that included new local sources of \$18.5 million, new state sources of \$8.6 million, increased use of the state general fund by \$9.3 million, and revenue raised by a private foundation of \$2.5 million.

The Authority submitted proposals to OFM in September 1990 for a motor vehicle manufacturers' fee and a tax on commercial marine fuels.]

EM-6. Puget Sound Grants Program

The Authority shall establish, administer, and monitor a grant funding program, similar in concept to the Public Involvement and Education Fund (PIE-Fund), to assist local and tribal governments and other entities in implementing their responsibilities under the plan.

Target Date: Propose legislation for new grant program by December 1, 1990.

[Status: There is no grant program which specifically funds Puget Sound plan implementation. Grants to local governments and other agencies are needed to implement elements SF-2, 4, and 8 (\$1.25 million per year), H-3 and 4 (\$0.25 million per year), SW-3 (\$0.5 million per year) and EM-10 (\$1 million per year). The total for those programs would be \$3 million per year. Implementation of additional plan elements could also be funded if sufficient funding is available from the new funding sources identified in element EM-5 or from other sources.]

EM-7. Shellfish Funding Strategy

Based on the results of the Shellfish Funding Assessment (SF-6), Ecology, in consultation with local governments, the Authority, and the Departments of Health, Fisheries, and Natural Resources, shall develop and implement a strategy to provide increased funding to local governments. Revenues from the funding strategy shall be used for implementation, primarily by local governments, of Puget Sound plan elements pertaining to shellfish protection and non-point source pollution control identified in the plan. This strategy shall focus on developing stable, long-term funding programs that use fees, taxes, or other mechanisms, such as financial incentives and disincentives.

Target Date: Ecology submits strategy to the Authority by December 1, 1990.

[Status: Ecology has developed and submitted a local option funding proposal for shellfish protection in high priority areas. Efforts to gain legislative approval of this proposal will be ongoing.]

Accountability

EM-8. Authority Oversight of Plan Implementation

8.1. Coordination of Plan Implementation

The Authority, in cooperation with EPA, Ecology, and the PSEP Management Committee, shall continue to coordinate implementation of the Puget Sound plan. The Authority shall (1) inform federal and state agencies and local and tribal governments of their responsibilities under the plan; (2) participate in committees and work groups; (3) provide formal and informal guidance; and (4) assist in obtaining funding.

To facilitate this process, Authority staff will be assigned as liaisons to each federal agency, state agency, tribal government, and local government which is given responsibilities by the plan. The Authority staff shall assure that the agency or government understands its responsibilities under the plan, assist the agency or government in implementation, monitor progress, and assist in resolving problems that arise during program implementation.

As part of its coordination responsibilities, the Authority shall continuously review the plan and amend target dates and program tasks as necessary to ensure plan implementation. In addition, problems and issues that are identified through coordination activities will be used to develop the next full revision of the plan, scheduled for 1994.

8.2. Plan Consistency Procedures

The Authority shall monitor the implementation of plan tasks by federal and state agencies and tribal and local governments. This monitoring will consider consistency with program goals and policies, with the intent of specific plan elements, and with adopted target dates. Federal consistency review procedures are discussed in element EM-14.

Because of the key role played by state agencies, each state agency with major plan responsibilities is encouraged to prepare a work plan for major program responsibilities. In addition, each state agency with major plan responsibilities shall:

- a. Notify the Authority in writing whenever modifications are proposed to be made to plan budget allocations for transfers to nonplan activities, for transfers between plan programs, or for transfers within plan programs where target dates or implementation of a task are affected. Notice shall be sent prior to any irretrievable commitment of resources to allow the Authority an opportunity to comment, if necessary;
- b. Submit a brief report at least every six months to the Authority regarding the status of the tasks assigned to the agency; and
- c. Provide copies to the Authority of reports, interagency agreements, work plans, and other significant work products developed pursuant to its implementation of each plan element.

The Authority shall provide guidance to implementing agencies regarding the form and content of the reports required under (b) through interagency liaisons.

State agencies with major plan responsibilities include:

Department of Ecology
Department of Natural Resources
Department of Health
Department of Agriculture
Department of Community Development
Department of Transportation
Department of Fisheries
Department of Wildlife
Conservation Commission
State Parks and Recreation Commission
Washington State Sea Grant (University of Washington)
Washington State Cooperative Extension (Washington State University)
Superintendent of Public Instruction

In addition to the review described above, the Authority may review Puget Sound related budgets and regulatory and enforcement activities of state and local implementing agencies as prescribed by RCW 90.70.055(5). The purpose of this review is to assist agencies in meeting timelines and other plan requirements, to ensure that they have adequate resources to fulfill their responsibilities under the plan, and to review the consistency of these activities with the plan.

8.3 Biennial Reports

State agencies and local governments identified in the plan shall submit written reports to the Authority documenting their consistency with the plan every two years as required by RCW 90.70.070(3). The Authority shall provide instructions to implementing agencies for that purpose. The Authority will use the in-

formation gathered during the biennial review process to prepare revisions to the plan as required by RCW 90.70.055(3). The state agencies that are required to submit reports include, but are not limited to:

Department of Ecology
 Department of Natural Resources
 Department of Health
 Department of Agriculture
 Department of Community Development
 Department of Trade and Economic Development
 Department of Transportation
 Department of Fisheries
 Department of Labor and Industries
 Department of Wildlife
 Attorney General
 Conservation Commission
 State Parks and Recreation Commission
 Washington State Sea Grant (University of Washington)
 Washington State Cooperative Extension (Washington State University)
 Superintendent of Public Instruction

The Authority shall review the success of plan implementation (including public and private actions) and report the results to the legislature and the governor in the State of the Sound Report every two years as required by RCW 90.70.055(4)(c). This report provides an analysis of the status and conditions of Puget Sound including a determination of the Sound's economic value. The report also addresses current and foreseeable trends in water quality and management of Puget Sound resources.

The information obtained by these processes will allow the Authority to make mid-term adjustments to target dates and program tasks as necessary to ensure plan implementation.

8.4. Review of Major Public Actions

As provided in RCW 90.70.070, the Authority shall continue to review major public actions being considered by federal and state agencies and local governments in order to determine whether the proposed action is consistent with the Puget Sound Water Quality Management Plan, with Authority goals and objectives, and with review criteria developed by the Authority.

In order to define the Authority's role in reviewing major public actions and to provide guidelines for determining an appropriate level of Authority response, the Authority establishes the following criteria governing its involvement:

- Whether the action is critical to implementation of the Puget Sound Water Quality Management Plan.
- Whether the action may be in direct and substantial conflict with the plan.
- Whether the action entails significant adverse water quality impacts which cannot be mitigated.
- Whether the action will have multiple effects or implications for various water quality issues or programs.

The Authority will use these criteria to determine which proposed actions are major.

As a result of such review the Authority may respond to a proposal in a variety of ways. Authority staff may respond to projects or documents which fall short of major but where clarification of plan requirements or technical comments would be of assistance to the responsible agency. The executive director of the Authority may submit comments on actions which are critical to plan implementation or affect more than one program. The Authority shall submit comments where unmitigated water quality impacts or substantial conflicts with the plan are involved. The Authority shall maintain a record of its review and comment activities.

The Authority is authorized to intervene in administrative or judicial proceedings (RCW 90.70.070 (4)). While the Authority intends that intervention in judicial proceedings would be the least common form of response, reserved for very rare circumstances, the Authority may intervene in administrative proceedings as warranted.

The Authority emphasizes that its review of major public actions does not replace the authority of the permit-issuing agency to make the substantive decision on a permit or other matter. Furthermore, Authority review of a proposed action does not in any sense constitute an appeal of an agency decision; the Authority does not intend to function as an appellate body.

The Authority will respond to a proposal within the established review period or within a timely period if no formal response period exists.

8.5. Notice of Actions Subject to Review

In order to ensure that the Authority is aware of activities which potentially merit its attention, the Authority will inform state and local agencies of the specific types of actions for which notice to the Authority should be given.

These actions may include program, policy, and permit actions, including actions taken under the State Environmental Policy Act (SEPA). All state agencies and local governments shall provide SEPA documents to the Authority wherever water quality, wetlands, or related issues within the Puget Sound plan area are involved. The Authority will respond when the proposal being analyzed meets one of the criteria listed above.

Target Dates: Reporting requirements are ongoing.

[Status: These reporting requirements were established in the 1989 plan. The Authority prepared State of the Sound Reports in 1986 and 1988.]

Enforcement and Legal Support

EM-9. Federal Enforcement

EPA shall initiate federal enforcement actions when necessary to ensure implementation of the Puget Sound plan and protection of Puget Sound. If situations arise where another federal agency has enforcement authority, EPA shall request appropriate action by that agency. EPA will also initiate federal enforcement actions on an independent basis, apart from requests of the Puget Sound Water Quality Authority.

[Status: EPA has taken numerous enforcement actions to protect Puget Sound. With completion of the CCMP for Puget Sound, there may be additional need for EPA to take enforcement action or request such action by other federal agencies.]

EM-10. Enhanced Local Enforcement

Local governments are encouraged to strengthen the enforcement and wording of existing laws, and develop and implement new ordinances which protect the water quality and habitat functions of wetlands and which control specific sources of nonpoint pollution, including stormwater. The state will provide matching funds to counties, cities, or local health agencies to assist in the development or revisions of programs and to augment investigations and prosecutions under those laws.

The enhanced enforcement of wetlands protection laws may encompass shoreline master programs, zoning ordinances, or other land development or construction codes which protect water quality or habitat functions of wetlands. Nonpoint enforcement efforts eligible for state grants include on-site septic systems, pumpout facilities at marinas, farm practices, or other sources which are identified as a result of the local nonpoint planning process. Local governments or health agencies are encouraged to use existing legal authority (including general police power, state health authority, or other legal tools) to adopt such ordinances or regulations as may be necessary to address nonpoint sources of pollution. Development and enforcement of stormwater regulatory programs are also eligible for funding, as are those activities related to local government compliance with the 1990 Growth Management Act (SHB 2929).

Funds will be made available for development and revision of ordinances as well as for investigation and prosecution of violations. Preference for grant awards shall be given to applicants whose enhanced enforcement program includes an educational component that publicizes enforcement actions. Efficient and innovative approaches to enforcement such as civil penalties, dedicated fines, and community service shall be encouraged.

Funds made available through the CCWF for enforcement will be used for start-up costs or seed monies to develop enforcement programs and not for ongoing staff needs.

Target Date: Program established August 1988.

[Status: The funding sources for this element are the Centennial Clean Water Fund and the other funding options proposed in EM-5. For CCWF monies, local governments apply for funds through the process set forth in the rule promulgated by the Department of Ecology. Under the grant program established by EM-6, local governments would apply directly to the Authority using procedures to be developed by the Authority. As of December 1, 1990, no funds have been made available from the CCWF for uses under this program.]

EM-11. Attorney General Support

The Attorney General shall make every effort to support the Puget Sound plan by providing enough attorneys to assist in agency rulemaking, permit writing, and enforcement. Legal expertise shall be provided at all stages of environmental protection activities when a request is made to the Attorney General's office by one of the implementing agencies. Agency personnel shall report difficulties they might have in securing legal support to the Authority after they have first reported this problem to their management and to the Attorney General's office.

Target Date: Ongoing.

[Status: The Office of the Attorney General provides legal advice and representation to all state agencies, including those which have enforcement responsibilities. Some state agencies, such as Ecology and Fisheries, have their own enforcement units that work with attorneys from the Attorney General's office. The Attorney General's office also provides advice on agency rulemaking, permit writing, and other tasks related to implementation of state laws and regulations.]

[NOTE: The following elements were included in the original Legal and Personnel Support Program. They have been completed and have not been renamed or included in this new enforcement and legal support section.]

**LP-2. Department
of Personnel Support**

[Element Completed]

[Status: This element called for each state agency responsible for implementing the Puget Sound plan to prepare a report to the Authority and Department of Personnel concerning whether existing job descriptions, qualifications, salary levels, and hiring procedures are adequate to support their activities. Minimal response was received from the agencies regarding this task.]

**LP-3. Department
of Personnel
Assistance**

[Element Completed]

[Status: In order to meet staffing requirements for plan implementation activities, state agencies needed support from the Department of Personnel. This element called for the Department of Personnel to assist agencies in filling positions, especially in the first biennium of plan implementation. Personnel will continue to assist in hiring and staffing needs of agencies implementing the plan.]

Federal Activities

**EM-12. Memoranda
of Understanding
with the
Department of
Defense**

The Puget Sound Estuary Program shall continue to develop plan implementation agreements with each of the following Department of Defense installations in the Puget Sound basin:

Puget Sound Naval Shipyard
Naval Submarine Base, Bangor
Naval Air Station Whidbey Island
Fort Lewis Army Base
McChord Air Force Base
Keyport Naval Undersea Warfare Engineering Station
Indian Island Undersea Warfare Engineering Station
Manchester Naval Supply Center

Through the agreement process, the estuary program shall work with each installation to identify conditions or activities on base that further the purposes of the CCMP or are inconsistent with the CCMP. The agreements should include appropriate commitments by all parties to address such conditions or activities in a timely manner. The agreements shall also provide for periodic review and updates as necessary.

Target Date: Complete agreements by January 1991.

[Status: The 1989 Puget Sound plan discussed environmental programs at several Department of Defense facilities, and called for continuing coordination with the Puget Sound Estuary Program (PSEP) in order to develop recommendations for the federal role in plan implementation.

The co-managers of the Puget Sound Estuary Program initiated discussions with eight military bases around Puget Sound in 1989: Fort Lewis Army Base; McChord Air Force Base; Naval Air Station Whidbey Island; Keyport and Indian Island Undersea Warfare Engineering Stations; Naval Submarine Base, Bangor; Manchester Naval Supply Center; and the Puget Sound Naval Shipyard. PSEP will continue to negotiate agreements with these bases to ensure their compliance with the plan. In addition, PSEP is coordinating its efforts with existing regulatory programs that oversee federal facilities, such as EPA's Superfund program.

All of the bases have indicated a willingness to help implement the plan, and the Navy has designated a single point of contact to help coordinate all participation by the individual Navy bases. Examples of some of the environmental improvements at the bases since the 1989 plan include the creation of environmental planning sections at Whidbey Island Naval Air Station (NAS) and McChord Air Force Base.

McChord is in the process of securing additional stormwater treatment equipment, and the base has also applied to EPA to have its NPDES permit amended to include all of the base's stormwater outfalls. Through recycling, McChord has also managed to greatly reduce the amount of spent solvents produced through its aircraft washing operations.

Whidbey Island NAS and Keyport and Indian Island Engineering Stations are currently revising their spill prevention plans, and will use the plans to address contamination of surface water runoff. Indian Island and Keyport Stations are also rewriting their personnel training plans to address water quality laws, hazardous waste management and hazardous materials handling practices. The Naval Submarine Base, Bangor, is participating in the Dyes Inlet watershed management committee.

Bangor is inventorying and mapping its wetlands, and prohibits construction within 200 feet of wetlands. Whidbey Island NAS is in the process of having its wetlands inventoried, and began several wetlands restoration projects during the summer of 1990. Fort Lewis Army Base completed its wetland inventory in 1984, and now has a computerized mapping system to assist in wetlands management.

The Puget Sound Naval Shipyard (PSNS) has actively participated in the Sinclair/Dyes Inlets urban bay action program for the past two years. An action plan was completed in July 1990, and the PSNS has signed an agreement to implement their portion of the action plan.

Nonpoint source pollution at all bases remains a concern because of the quantities of petroleum and hazardous substances handled by the bases, the presence of old hazardous waste sites on many of the bases, the proximity of many of the bases to Puget Sound, and the lack of comprehensive plans for best management practices at some of the bases. Recent spills caused by operator errors at Whidbey Island NAS and Manchester Naval Supply Center underscore the need for more extensive training and supervision of personnel in order to make existing spill prevention plans effective.

Pesticide use is also a potential concern, Bangor is the only base with an integrated pest management plan to minimize use of pesticides. (McChord does have a

Forest Management Plan that recommends against using herbicides on the base's forests.) Lack of resources (on the part of the bases and PSEP agencies) remains a significant obstacle to implementing the Puget Sound plan at the bases.]

EM-13. Review of Plan by Federal Agencies

Federal activities which directly or indirectly affect the quality of Puget Sound shall further the goals of the plan. Federal agencies are requested to take action on any plan element that specifically names the agency. All federal agencies are requested to review the plan on a continuing basis to determine whether any of their projects or programs potentially assist or conflict with the goals of the plan.

The following federal departments and agencies shall examine their programs for consistency with the plan. Agencies not included in this list are still required to comply with this element.

Department of Agriculture:

- Agricultural Stabilization and Conservation Service
- Farmers Home Administration
- Forest Service
- Soil Conservation Service

Department of Commerce:

- National Oceanic and Atmospheric Administration
- National Marine Fisheries Service

Department of Defense:

- Corps of Engineers
- Air Force
- Army
- Navy

Department of Energy

- Environmental Protection Agency
- Housing and Urban Development

Department of Interior:

- Bureau of Land Management
- Bureau of Reclamation
- Fish and Wildlife Service
- Minerals Management Service
- National Park Service
- Office of Surface Mining
- U.S. Geological Survey

Department of Transportation:

- Coast Guard
- Federal Highway Administration

The co-managers of the Puget Sound Estuary Program shall contact federal agencies, such as those listed, in writing to notify them of the requirements of the Puget Sound Comprehensive Conservation and Management Plan and to identify a PSEP contact for that agency.

If an agency finds that its programs or projects may adversely affect the implementation of a plan goal, the agency shall notify the designated PSEP contact for that agency. Where appropriate, the PSEP co-managers shall negotiate memoranda of understanding (MOUs) with agencies to clarify expectations

under the management plan agency commitments in order to best ensure plan implementation.

Target Date: PSEP to make requests to listed agencies by January 1, 1991.
Agencies to comply on an ongoing basis.

[Status: This is a new requirement of the Comprehensive Conservation and Management Plan.]

EM-14. Federal Consistency Review Process

The co-managers of the Puget Sound Estuary Program, with the assistance of the Management Committee, shall implement a process to review federal activities for consistency with the Puget Sound plan.

The purpose of the review process is to ensure that federal activities are consistent with and will further the purposes and objectives of the Puget Sound Comprehensive Conservation and Management Plan. This process is called for in Section 320(b)(7) of the Clean Water Act. The review process shall consider all federal activities that may significantly affect the goals of the plan, including but not limited to federal financial assistance and development projects. The review process shall complement and not duplicate existing state-federal review processes, such as the Section 319 Nonpoint Source consistency review process. The consistency review process shall be implemented with assistance from the Coastal Zone Management (CZM) Program review process.

This process shall work as follows:

1. All appropriate portions of the plan shall be incorporated into the CZM Program. The CZM review committee will notify the PSEP co-managers of the federal activities that are submitted to them for review.
2. For the portions of the plan that are not appropriate for CZM review, the PSEP Management Committee shall determine how to receive notice and conduct the necessary consistency review.
3. If there appears to be no consistency problem, the agency or the CZM office shall be notified. If there does appear to be a problem, the federal agency in question shall be notified along with the PSEP Management Committee. The committee shall consider the issue at a meeting. An initial attempt will be made by the management committee to work through the difficulties with the federal agency whose activities are assessed as being out of compliance with the plan.
4. If the problem is resolved, the agency and the CZM office shall be notified. If the problem persists, the PSEP co-managers shall escalate their efforts to resolve the issues. These efforts shall include, but not be limited to, negotiations, interagency work groups, exercising of state powers, memoranda of understanding, letters of concurrence, and elevation of the issue to higher levels of government.
5. In cases where a resolution cannot be reached, the CZM office shall be expected to withhold its approval of the project.
6. The following conditions will hold true for all cases of dispute over plan consistency:

- a. Each federal agency on the PSEP management committee shall abstain from any review of its own proposal.
- b. A single coordinator or convener shall be appointed to facilitate the attempts to resolve the disagreements.
- c. Appropriate opportunities for public participation shall be provided.
- d. A timeline for review will be followed, not to exceed 60 days for new projects and not to exceed 30 days for continuations and amendments.

The PSEP co-managers shall take any other actions necessary to ensure that federal agencies act consistently with the plan. In accordance with the Puget Sound Designation Agreement, EPA shall actively seek commitments from other federal agencies that may be needed to implement the plan.

EPA shall use any appropriate means to secure federal agency commitments, for example:

1. Developing formal agreements with other federal agencies to ensure compliance;
2. Developing or recommending federal policies, guidelines, rules, or regulations to implement the plan;
3. Convening interagency work groups to develop appropriate implementation schedules; or
4. Providing financial assistance.

Target Date: PSEP to implement a consistency process by January 1991. Other actions to ensure federal consistency shall be taken on a continuing basis.

[Status: This is a new element.]

MAJOR PUBLIC ACTIONS

None.

LEGISLATION REQUIRED

New legislation will be required for the new revenue options identified in elements EM-5 and EM-7 and may be required for the grants program in EM-6.

ESTIMATED COST

The Shellfish Funding Strategy, element EM-7, will require a staff person at Ecology at a cost of \$64,000 per year. This staff person will continue to work to refine the proposal, work to gain its legislative approval, and assist local governments in its implementation. New element EM-6, Authority Grant Funding, allows the Authority to provide funding through grants to local governments and other agencies to implement plan elements. The administrative costs to the Authority would be between four and five percent of the expected grant base of \$5 million per year.

Full funding for the enforcement elements of this program is estimated to cost approximately \$1.5 million per year. Of this, \$1.2 million per year is estimated for enhanced local enforcement (EM-10) to be funded by state matching grants to local governments from the CCWF and new (EM-5) funds.

The cost of the federal activities program (EM-12 through EM-14) is \$195,000. This does not include costs to federal agencies for participation in the review process established under this program, nor does it include costs that may arise from any new agreements, policies, or regulations that may be developed as a result of the initiatives described in this program.

No private sector costs have been identified for this program.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Estuary Management & Plan Implementation

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
EM-5 Implementation of Long-Term Funding	\$0	\$28,251	\$0	\$0	\$0
EM-6 Puget Sound Grants Program	\$0	\$0	\$291,720	\$463,966	\$463,966
EM-7 Shellfish Funding Strategy	\$0	\$0	\$143,084	\$143,084	\$0
EM-10 Enhanced Local Enforcement	\$874,245	\$666,666	\$2,332,000	\$2,332,000	\$2,332,000
EM-11 Attorney General Support	\$44,159	\$0	\$621,884	\$621,884	\$621,884
EM-12 MOUs with Department of Defense	\$0	\$0	\$12,644	\$12,644	\$12,644
EM-13 Review of Plan by Federal Agencies	\$0	\$0	\$12,644	\$12,644	\$12,644
EM-14 Consistency Review Process	\$0	\$0	\$399,370	\$380,996	\$380,996
LP-2 Department of Personnel Support	\$46,607	\$0	\$0	\$0	\$0
TOTALS	\$965,011	\$694,917	\$3,813,346	\$3,967,218	\$3,824,134

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$31,549	\$0	\$0	\$0	\$0
Department of Natural Resources	\$14,202	\$0	\$105,000	\$105,000	\$105,000
Department of Health	\$13,702	\$0	\$147,000	\$147,000	\$147,000
Department of Revenue	\$0	\$0	\$0	\$0	\$0
Department of Ecology	\$216,745	\$0	\$800,710	\$782,336	\$639,252
Local Governments	\$666,665	\$666,666	\$2,332,000	\$2,332,000	\$2,332,000
Office of Financial Management	\$0	\$0	\$0	\$0	\$0
Parks and Recreation Commission	\$0	\$0	\$0	\$0	\$0
Puget Sound Water Quality Authority	\$2,282	\$28,251	\$411,836	\$584,082	\$584,082
Department of Fisheries	\$8,433	\$0	\$8,400	\$8,400	\$8,400
Department of Wildlife	\$11,433	\$0	\$8,400	\$8,400	\$8,400
TOTALS	\$965,011	\$694,917	\$3,813,346	\$3,967,218	\$3,824,134

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$1,291,720	\$1,463,966	\$1,463,966
Centennial Clean Water Account	\$707,580	\$500,000	\$1,332,000	\$1,332,000	\$1,332,000
Local Funding Sources	\$166,665	\$166,666	\$0	\$0	\$0
State General Fund	\$90,766	\$28,251	\$1,189,626	\$1,171,252	\$1,028,168
TOTALS	\$965,011	\$694,917	\$3,813,346	\$3,967,218	\$3,824,134

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

FISH AND WILDLIFE HABITAT PROTECTION PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION

Scope

The Puget Sound Water Quality Act calls for the Puget Sound plan to include recommendations on protecting, preserving and, where possible, restoring wetlands and wildlife habitat and shellfish beds throughout Puget Sound (RCW 90.70.060 (11)). The 1987 and 1989 plans included a wetlands protection program and a shellfish protection and restoration program, both of which are underway. However, there was no comparable program for the protection and restoration of non-wetland terrestrial or deep/open water habitats.

The Authority's role in habitat protection focuses upon aquatic systems. However, the Authority recognizes that fish and wildlife protection extends beyond aquatic boundaries.¹ This program establishes a mechanism whereby the various federal, tribal, state, and local entities that manage fish and wildlife can coordinate their efforts so that habitat protection is accomplished from an ecosystem perspective.

Habitat Values and Functions



The Puget Sound basin is composed of a unique diversity of habitat types, from deepwater marine areas to upland forests, that provide support for a wide variety of plants, fish, and wildlife species.

The habitats in Puget Sound provide plants, fish, and wildlife with their basic requirements for survival, such as food, water, and cover, as well as special seasonal requirements related to growth and reproduction. The open waters of Puget Sound provide important habitat for thousands of organisms, including phytoplankton and zooplankton, subtidal macroalgae (kelp), benthic invertebrates, fish, and marine birds and mammals. Many Puget Sound species require both marine/wetland and non-marine/non-wetland habitats at different times in their life cycles. The Department of Wildlife estimates that up to 70 terrestrial species plus all the anadromous fish species (salmon, steelhead trout, smelt, shad, and sturgeon) rely on both the marine waters of the Sound and upland habitats, usually riparian corridors.

¹ For the purpose of this program, aquatic systems include the waters of the state as defined by the Forest Practices Board including associated riparian zones and shorelands. Wetlands are aquatic systems and are addressed by the Wetlands Protection Program. This program addresses those systems that are not commonly considered wetlands, such as the deep/open waters of Puget Sound and stream corridors.

Planning for habitat protection in Puget Sound requires that activities affecting habitat be managed from a regionwide, ecosystem perspective to ensure that the best representation and distribution (i.e., diversity) of habitats remains to preserve the natural values and functions of those habitats. It is also important to maintain the necessary physical and hydrological connections between different habitat types to prevent isolation of those habitats and the species living in them. In general, the fragmentation and isolation of habitats promotes the local extinction of species. However, in some cases, having patches of habitat is beneficial, as in the case when artificial reefs are interspersed to increase bottomfish production or when a particular habitat type is limited to begin with. What is important is to assemble our knowledge of the habitat pieces to create a regionwide habitat picture through which to focus our management efforts.

In addition to supporting fish and wildlife populations, ecosystem functions of many habitat types include water quality protection, flood control, and preservation of biological diversity. For example, riparian vegetation plays an important role in reducing turbidity, trapping sediment to prevent erosion, and providing thermal cover to prevent water temperature extremes. Marine shoreline vegetation absorbs wave energy and slows erosion. Floodplain habitats reduce the height and velocity of floodwaters. Ecosystems constitute a web of interdependence. Habitats require a delicate balance between plants and animals to function physically, and to support other living things, including humans.

Finally, the habitats of the Puget Sound basin, and the fish and wildlife they sustain, provide us with economic, scenic, and educational opportunities. For example, the commercial and recreational harvest of fish and shellfish in 1986 was valued at \$168 million.² Many residents and tourists enjoy and spend money on various forms of outdoor recreation around the Sound, including hunting, fishing, boating, bird-watching, sightseeing, and other activities. Fish and wildlife habitat also provides people with places, as well as plants and animals, for scientific research and education.

The Loss of Habitat

The population of Puget Sound is projected to increase by 47 percent to 4.4 million by 2010.³ Rapid growth in the region's population (and associated development) is the greatest threat to fish and wildlife habitat. Washington Environment 2010 estimated that population and urban growth between 1930 and 1980 resulted in the conversion of about four million acres of forest lands to other uses, and each year between 1982 and 1987, 1,350 acres of cropland and pastureland were converted to urban or built-up uses.⁴ (For reference, there are currently about 16.2 million acres of forested land in the state and there were about 16 million acres of total farmland during the period above.)

Exactly where and how this growth occurs also has significant implications for fish and wildlife habitat protection. The 1990 Washington State Legislature passed a growth management act (Chapter 17, Laws 1990, 1st ex. sess., also known as SHB 2929) which recognizes that uncoordinated and unplanned growth poses a threat to the environment. Urban sprawl must be reduced (and

2 PSWQA, State of the Sound 1988 Report.

3 Washington Office of Financial Management, 1989 population trends for Washington state.

4 Washington Environment 2010 Committee, The state of the environment report.

development in other areas encouraged) to conserve fish and wildlife habitat and other open and rural lands amidst the growth.

More specifically, the human activities contributing most to present and future habitat loss are: (a) conversion of land to commercial or residential use; (b) draining or filling of wetlands; (c) activities associated with development, such as dredging and improper construction practices; (d) improper timber management practices; (e) improper agricultural practices; (f) disruption of watercourses or surface and groundwater sources; (g) degradation from urban pollutants; and (h) spills of oil and other hazardous substances. Some of these issues are addressed elsewhere in the wetlands, shellfish protection, spills, and nonpoint source pollution programs of this plan.

Existing Laws and Programs for Protecting Habitat

Several existing laws, rules, and programs provide some protection to various types of fish or wildlife or their habitat. At least 22 federal laws, 20 state laws, tribal treaty rights, local laws and ordinances, and private programs help protect non-wetland fish and wildlife habitat. More detailed information on the laws and programs mentioned below is provided in the Authority's issue paper, *Protecting Fish and Wildlife Habitat in Puget Sound*, released in March 1990.⁵

A broad range of federal laws and programs protects various Puget Sound habitats. Of most interest are the laws that regulate dredging, filling, and construction in U.S. waters (Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act); require coastal zone management (the Coastal Zone Management Act); protect threatened and endangered species and their habitats (the Endangered Species Act) require environmental consideration for various federal actions (the Fish and Wildlife Coordination Act, the National Environmental Policy Act, and the Northwest Power Planning Act); and protect specific areas and animals (the Marine Protection, Research, and Sanctuaries Act, the Marine Mammals Act, the National Estuary Program, the National Wilderness Preservation Act, and the Wild and Scenic Rivers Act). Agencies which implement these laws and have programs affecting Puget Sound habitats include the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS), the National Park Service (NPS), the U.S. Army Corps of Engineers (Corps), the National Oceanographic and Atmospheric Administration (NOAA), and the Environmental Protection Agency (EPA).

Washington state agencies have additional laws and programs that protect fish and wildlife habitat and also act to implement existing programs in the Puget Sound plan. The Departments of Wildlife and Fisheries jointly implement the Hydraulic Code for the protection of fish life. The governor's recent Executive Order relating to wetlands protection (EO 90-04) lent additional support for implementing the Hydraulics Code to assure wetlands protection. In addition, Wildlife administers the Bald Eagle Protection Rules and the state Endangered Species Program.

Also, in a major new program (Priority Habitats and Species Program), Wildlife is working with the Department of Natural Resources (DNR), the Forest Practices Board, and the TFW process to define, identify, map, and prepare management recommendations for habitats and species within WDW's legislative

⁵ PSWQA, Issue paper: *Protecting fish and wildlife habitat in Puget Sound*, 1990.

mandate on commercial forest land in 1990. The second part of this project is to expand the effort to non-forest lands in 1991.

Along with its game and nongame programs, Wildlife also maintains wildlife habitat data in a geographic information system (GIS—a computerized system for overlaying data about an area, e.g., its legal boundaries and its use by species of concern, on maps). Having habitat information on a GIS system vastly increases the ability of people, including non-biologists, to use and integrate all the different types of information that biologists collect. The ultimate goal is for all the habitat data to be usable and shareable through one common system. Wildlife is upgrading and expanding its stream habitat information base, and it is conducting education programs, such as Project Wild (school curriculum and teacher training program) and the Backyard Wildlife Habitat program.

The Washington Department of Fisheries manages and enhances the food fish and shellfish resources for the state and jointly implements the Hydraulic Code with Wildlife. Three major Fisheries programs are the Salmon, Marine Fish, and Shellfish programs. Fisheries database materials include the 1975 Puget Sound stream catalogue and a spawning ground database. Fisheries currently does not have the resources to put its habitat data on a GIS system.

The Department of Natural Resources (DNR) is involved in the implementation of the TFW Agreement and managing forest lands (Forest Practices Act) and has a GIS system containing data on upland trust lands. Also, through TFW, DNR has been tasked to identify and close orphaned roads used for timber operations. DNR recently initiated the Sustainable Forestry Roundtable to address issues of harvest rate and size which are broader than the scope of TFW.

In addition, DNR's Aquatic Lands Division manages state-owned aquatic lands and is carrying out a pilot project to inventory nearshore marine habitat which includes updating the USFWS National Wetland Inventory maps. Currently planned is an education program using funds from the Aquatic Lands Enhancement Account. The Natural Resources Conservation Areas program can acquire property of outstanding scenic or ecological value. The Natural Heritage Program (the Natural Area Preserves Act) classifies, inventories, and maintains a database of natural heritage resources, and some of the most valuable areas are protected in the Natural Area Preserves System. The nearshore habitat inventory and parts of the Natural Heritage database both need to be entered into the Puget Sound GIS. The department also manages transitional and agricultural trust lands.

The Department of Ecology coordinates state review of federal licenses and permits related to the Clean Water Act, oversees shoreline development and management activities (the Shoreline Management Act), coordinates environmental consideration in state activities (the State Environmental Policy Act), controls discharge of pollutants into state waters (the Water Pollution Control Act), and regulates water resource utilization (the Water Resources Act, Minimum Water Flows and Levels Act).

The State Parks and Recreation Commission manages about 40 park properties in the Puget Sound area. It also manages the state Scenic Rivers Program (Scenic Rivers Act), has an interpretive program at interpretive centers and schools, and participates in the DNR Natural Area Preserves Program.

The Interagency Committee for Outdoor Recreation (IAC) has recently been working with the Washington Wildlife and Recreation Coalition to develop a

statewide action plan to acquire high priority sites for both wildlife habitat conservation and outdoor recreation. The 1990 Washington State Legislature has appropriated \$53 million for acquisition. In the future, state agencies and local governments will nominate priority sites for acquisition.

To varying degrees local governments have programs and regulations that protect fish and wildlife habitat. Options used by some local governments include open space programs, sensitive area protection programs, zoning ordinances, clearing and grading ordinances, drainage ordinances, comprehensive and sub-area plans, and tax incentive programs.

For counties with both a population of 50,000 or more and a population increase of more than 10 per cent in the last 10 years, habitat protection will take a new direction as a result of the 1990 Growth Management Act (SHB 2929).

The act requires affected counties and the cities within them to adopt comprehensive land use plans and development regulations, and the state Department of Community Development (DCD) is charged with implementing many provisions of the Growth Management Act. DCD's responsibilities include adopting guidelines to guide local governments affected by the bill in designating critical areas, which include fish and wildlife habitat conservation areas. In developing these guidelines, DCD must consult with the Department of Ecology and interested parties. The act further charges that land use plans shall identify open space corridors within and between urban growth areas, including lands useful for recreation, wildlife habitat, trails, and connection of critical areas.

DCD will also assist in inventorying and collecting data related to land use and critical areas, and, in late 1990, will report on data needs, availability, and costs. It will work with the Department of Information Services and other state agencies to ensure that data collection is coordinated and that data can be shared. The act also requires the department to provide financial and technical assistance to counties and cities in preparing their comprehensive plans. By September 1, 1991, the cities and counties affected by the act must designate areas for specified purposes (including critical areas) and adopt development regulations precluding land uses or development that is incompatible with the purposes of those areas. They must develop their comprehensive land use plans by July 1, 1993.

Tribal governments have land use planning and related regulatory authorities over tribal trust lands. Treaties in the Puget Sound area have been interpreted to establish a role for the tribes in fisheries management and may imply that the tribes have a right to ensure protection of fish habitat to sustain tribal fisheries. Tribal governments and their staff have established programs to protect fish and wildlife habitat on tribal lands and, in conjunction with the staff of the Northwest Indian Fisheries Commission, work with federal, state, and local agencies to protect fish and wildlife habitat.

Finally, many valuable habitat sites have been protected through voluntary private sector programs. These include land trusts, conservation easements, and the actions of individuals and volunteer citizens groups.

Institutional Problems

The laws and programs described above, while numerous, do not provide a comprehensive, coordinated ecosystem approach to managing Puget Sound fish and wildlife habitats. A number of issues related to developing such an approach to habitat management need to be jointly addressed and solved by the Puget Sound agencies, governments, organizations, and individuals. These issues in-

clude working toward a goal of no net loss of aquatic and riparian habitat in Puget Sound with a long-term net gain, developing an integrated definition of important habitat, setting Soundwide habitat priorities, improving inventorying and monitoring efforts, improving coordination between agencies and programs, and developing a long-term strategy to prevent further degradation of aquatic and riparian habitat and to address the no net loss goal.

Another problem is that agencies responsible for managing Puget Sound fish and wildlife habitats do not have sufficient authority to adequately protect these habitats. For fish habitat, habitat protection authority (through the Hydraulic Code) above the ordinary water mark is limited to those projects that would change the natural flow or bed of a stream or river that is comprised of salt or fresh water. The Hydraulic Code does not authorize protection of habitat for wildlife (other than fish).

A third problem is that the public lacks awareness and understanding of habitat protection issues and programs in the Puget Sound area. The programs that currently exist need to be expanded and coordinated to focus effectively on Puget Sound habitat issues. Public involvement in those issues also needs to be encouraged.

Finally, because of staff and budget limitations, resource agencies and others responsible for managing fish and wildlife habitat have been severely constrained in their habitat management activities, including gathering data on habitats, storing and sharing data through compatible data systems, and conducting adequate field investigations. Existing programs need to be supported and expanded to fully address Puget Sound habitat issues.

PROGRAM STATUS

This is a new program. The issue of fish and wildlife habitat protection was included in the 1987 and 1989 plans' "unfinished agenda" of issues that could not be addressed due to time and resource constraints. Throughout extensive public comment, fish and wildlife habitat protection consistently ranked near the top among the unfinished agenda items needing attention. In response to the concern, the Authority prepared draft and final issue papers and then followed up with this program.

PROGRAM GOAL

To ensure that federal, state, local, and tribal agencies coordinate fish and wildlife habitat protection programs so that, in the short term, there is no net loss and, in the long term, a net gain of aquatic and riparian habitat and other habitat important to water quality protection in the Puget Sound basin.

STRATEGY

The strategy for achieving the goal is to (1) encourage and support efforts by state and federal resource agencies, local governments, tribes, and private organizations to act proactively to protect rapidly disappearing aquatic systems in the near term; and (2) coordinate among existing agencies and governments in order to effectively protect and manage Puget Sound fish and wildlife habitat over the long term by providing integrated solutions for habitat protection.

PROGRAM ELEMENTS

H-1. Coordination with DCD

The Puget Sound Water Quality Authority shall coordinate with the Department of Community Development on habitat protection-related issues, as DCD works with local governments to implement the Growth Management Act (SHB 2929).

Target Date: Ongoing.

H-2. Habitat Task Force

As co-leads, Wildlife, DNR, and USFWS may invite representatives from the Authority, Fisheries, Ecology, DCD, IAC, State Parks, the Cooperative Monitoring, Evaluation, and Research Committee, TFW, USFS, NOAA, EPA, the Corps, and other appropriate federal agencies, local and tribal governments, private organizations and landholders, the scientific community, and other appropriate entities to participate in a task force to develop an ecosystem approach for managing Puget Sound habitats. Wildlife and USFWS are encouraged to use the Sustainable Forestry Roundtable and the Timber/Fish/Wildlife (TFW) agreements as models in establishing this task force. Since considerable effort has already focused on habitat protection on commercial forest land, the task force should not address these lands at this time. Consistent with the Authority's goal for this program, the task force is encouraged to address issues regarding the protection of aquatic systems and other habitat important to water quality protection. The task force may consider the following tasks:

Task 1. Definition. Develop and adopt an integrated definition of important fish and wildlife habitat in Puget Sound, pulling together the current definitions or policies used by different agencies and governments.

Task 2. Priorities. Set habitat priorities, within and beyond what is designated as important (Task 1), to form a framework for agencies and other governments to use when managing and protecting Puget Sound habitats. Habitat priorities shall be reported to the Puget Sound Research Program.

Task 3. Program list. Compile a comprehensive list of specific agency and government habitat management or protection programs, including a description of each agency's or government's habitat management policies and goals, to be made available to agencies, other governments, and the public.

Task 4. Protocols. In coordination with W-4.3 (Wetland Inventory and Tracking Strategy), direct the development of uniform inventory protocols to be used by agencies, governments, and organizations collecting data on fish and wildlife habitat in Puget Sound. These shall be part of the Puget Sound Protocols and Guidelines (L-3). Protocols shall include lists of minimum information and formats for data transfers.

Task 5. Tracking progress. In coordination with W-4.3, explore the feasibility of developing a program for tracking and monitoring progress on the goal of no net loss and long-term net gain of non-wetland aquatic and riparian habitat and other habitat important to water quality protection, including use of a permit tracking system to monitor habitat loss and mitigation for permitted activities.

Task 6. Interagency information exchange. In coordination with W-5 (Wetlands Interagency Coordination), develop procedures to ensure interagency coordina-

tion and information exchange on issues relating to fish and wildlife habitat protection in Puget Sound after the work of the task force is completed, including procedures to review and update the integrated definition of important fish and wildlife habitat (Task 1) and habitat priorities (Task 2).

Task 7. Long-term strategy. Develop a long-term protection/management strategy for protection of important fish and wildlife habitat in Puget Sound using regulatory and non-regulatory methods, including:

a. Specific actions to be undertaken by federal and state agencies and local governments to protect important habitats. These actions shall integrate the elements of this program and shall be coordinated with local government planning efforts resulting from the Growth Management Act (SHB 2929). They shall also include the establishment of a Soundwide habitat preservation program using priorities set in Task 2.

b. Recommendations for legislation which would provide for a comprehensive, coordinated approach to protecting and managing fish and wildlife habitat in Puget Sound, including aquatic systems, with appropriate goals and funding. At a minimum, the legislation should give the state agencies responsible for managing fish and wildlife habitat the authority to require protection of important Puget Sound habitats beyond the scope of fish life within the ordinary high water mark.

c. Recommendations to maximize public and private incentives to protect important Puget Sound habitats.

d. Recommendations for increasing funding for current and new programs that manage and protect Puget Sound habitats.

Implementation of this strategy shall begin directly after the work of the task force is completed, i.e., early in 1993.

Task 8. Coordination. Coordinate with other existing federal, state, regional, or local efforts, including DCD's work to implement the Growth Management Act (SHB 2929), and with other plan programs addressing issues related to habitat management and protection such as element W-6. Explore how local governments' habitat protection programs mandated by SHB 2929 can be integrated with the efforts of TFW and the Forestry Roundtable to develop an ecosystem approach to habitat protection based on landscape ecology.

Task 9. Urban habitat. Address/evaluate how both habitat protection in urban areas and requirements for urban density requirements can be accommodated.

Target Dates: Convene task force by July 1, 1991. Report to Authority on tasks 1-3 by December 31, 1991. Final task force report to Authority by December 31, 1992.

H-3. Habitat Database and Inventory

3.1 State Agencies

The Departments of Wildlife, Fisheries, Natural Resources, Ecology, and other state agencies that collect data on Puget Sound habitats shall enter or continue entering existing data on non-wetland aquatic systems (deep/open water, riparian, and shoreland habitats) onto existing GIS systems to be shared between systems. The data shall be provided to the Puget Sound GIS (element M-4) which will be used to update the Puget Sound Atlas, and they shall be made available to other agencies, governments, and the public. These efforts shall be coordinated with the work of the Washington Geographic Information Council and with DCD as it guides data management related to regional growth management.

Wildlife, Fisheries, and DNR shall increase their efforts to inventory Puget Sound fish and wildlife habitat relevant to this program.

Finally, Wildlife, Fisheries, DNR, Ecology, and other state agencies that have habitat data on aquatic systems shall work cooperatively to develop a list describing the kinds of data each agency has relating to these habitats.

3.2. Local and Tribal Governments

The Authority shall request state funding to establish a demonstration program of matching grants (in coordination with DCD and the Washington Department of Information Services) for local governments and tribes to enhance existing computerized databases and to improve access to those databases for those without such databases. Funds could also be used to conduct inventories of local non-wetland aquatic habitats (including deep/open water, riparian, and shorelands). Such inventories should be conducted according to current Puget Sound protocols. Data should be provided to state agencies in a format specified by the granting committee.

Grant awards would be made through a committee of members from Wildlife, Fisheries, DCD, and the Authority. The grant program will promote efficient use of funds for regionwide data collection and will benefit the state by increasing available data.

3.3. Federal Agencies

In coordination with W-5 (Wetlands Interagency Coordination) and the Puget Sound Estuary Program Management Committee, USFWS shall work with other appropriate federal agencies, including USFS, NPS, EPA, NOAA, USGS, Department of Defense (DOD), Army Corps of Engineers, and the Bonneville Power Administration, to share their data and information on Puget Sound fish and wildlife habitats with other Puget Sound agencies. A Memoranda of Understanding (MOU) could be developed between federal agencies to facilitate transfer of information.

Target Dates: Wildlife, Fisheries, DNR, Ecology, and federal agencies shall initiate work on H-3.1 and H-3.3 by July 1, 1991. The tribe/local government grant program shall be developed by January 1, 1992, with the first round of grants awarded in summer 1992.

H-4. Habitat Education Strategy

4.1. State and Federal Agencies

In coordination with W-7 (Wetlands Education Strategy), Fisheries, Wildlife, Natural Resources, Ecology, and USFWS shall develop and implement a long-range education strategy for the protection of aquatic habitat (including deep/open water, riparian, and shoreland habitat) that augments their existing education programs. This strategy shall build on and integrate elements in the Education and Public Involvement Program of this plan, specifically PI-1.2 (Technical Assistance), EPI-2 (Coordination Mechanisms), EPI-3.4 (Interpretive Centers), EPI-3.3 (Wildlife Habitat Education), EPI-4 (Volunteer Audiences), EPI-5.2 (Habitat Protection), and EPI-6.1 (Teacher Training).

The strategy shall address the critical role of aquatic systems and associated habitat in maintaining fish and wildlife populations and other important ecosystem functions, such as water quality protection. The strategy shall address the need to manage and evaluate various habitats from a regionwide, ecosystem perspective. Other habitat issues, such as the impact of the projected growth in the region, shall also be addressed.

The strategy shall involve entities and individuals possessing expertise in the field of habitat protection education. These include staff from Fisheries, Wildlife, Ecology, State Parks, tribes, local governments, universities, and private nonprofit conservation groups. Wildlife, Fisheries, DNR, and Ecology shall work with those state agencies and groups to implement the strategy and to coordinate with other ongoing water quality and habitat protection education efforts, such as those related to watershed planning and TFW. Strategy components may include: (a) guidebooks on habitat protection techniques or on habitat descriptions and locations; (b) public workshops and field trips; (c) interdisciplinary workshops and conferences for government and agency staff, as well as elected officials; and (d) backyard wildlife enhancement projects. To the extent possible, public libraries shall be provided with educational material on Puget Sound aquatic systems, and associated habitats and populations, and the need and methods to protect them.

Through the Puget Sound Estuary Program, federal agencies, including the Army Corps of Engineers, USFWS, USFS, NOAA, SCS, and EPA, shall coordinate with and help support this education effort. EPA shall be encouraged to use its Center of Excellence to coordinate federal agency information on aquatic habitat (including deep open water, riparian, and shoreland habitats) protection for use by local governments.

4.2. Local and Tribal Government Habitat Enhancement and Public Education

With the Department of Wildlife as lead, the Authority, Wildlife, Fisheries, DNR, and USFWS shall work with tribal and local governments to establish a habitat enhancement and public education program. Wildlife shall invite tribal and local governments to apply for habitat enhancement projects for marine, stream, riparian, wetland, or other habitats important to water quality protection, on the condition that they implement a public education program related to the project. Joint tribal and local government projects are encouraged. For tribes, the education will include habitat issues presented in the context of cultural heritage, cultural values, and tribal rights. Wildlife will work with other state agencies and local and tribal governments to develop the application and selection process.

4.3. Wildlife Enhancement and Education, Private Sector

With the Department of Wildlife as lead, Fisheries, DNR, and USFWS shall work with developers, business and industry, local conservation groups, and local land trusts to implement joint habitat enhancement and education programs. Developers, business and industry, private conservation groups, or land trusts could apply for the funding or incentives on the condition that the project will provide public education on habitat, such as that envisioned at the Koll Center, North Creek, in Bothell. Wildlife, Fisheries, Ecology, and an interpretive specialist at State Parks shall be available to provide technical assistance on habitat enhancement or on educational activities if requested. Wildlife will form a steering committee to formulate funding and/or incentives for this program.

Target Dates: Wildlife, Fisheries, DNR, Ecology, State Parks, and federal agencies shall begin implementing work on H-4.1 by July 1, 1991. Wildlife and the Authority will report on the funding mechanisms to establish H-4.2 by January 30, 1992. Wildlife shall establish a steering committee for H-4.3 by September 1991.

H-5. Public Involvement

The Authority's public involvement policy (PI-1.1) shall be followed by all state and local government agencies in implementing fish and wildlife habitat protection in Puget Sound. Specific actions to be implemented are:

5.1. Information on Hydraulic Project Approvals (HPAs)

The Departments of Wildlife and Fisheries shall provide notice to agencies, local and tribal governments, and the public of current and pending HPAs for work in Puget Sound. Examples of ways to do this include a regular mailing of HPA lists to other agencies and governments and to public libraries. The notification is for informational purposes and is not a solicitation for public comment. Wildlife and Fisheries shall at a minimum make their computer listing of pending and recently issued HPAs available to the public. Wildlife and Fisheries and appropriate federal agencies (such as the U.S. Army Corps of Engineer's issuance of 404 permits) are encouraged to promote interjurisdictional consistency by exploring ways to coordinate their permitting activities with that of local governments.

5.2. Public Forum on HPA Standards

The Departments of Wildlife and Fisheries shall conduct a round of public Puget Sound forums to discuss existing standards for the various activities regulated under the Hydraulic Code and to review the public involvement aspects of the permitting process as it relates to the Puget Sound region. These forums shall be conducted every three years. Fisheries and Wildlife shall report back to the Authority on the outcomes of these forums.

Target Date: The Departments of Wildlife and Fisheries shall at minimum make their computer listing of HPAs available to the public by October 1, 1991. If funding becomes available, Fisheries and Wildlife shall develop a system to further distribute HPA listings so that they are accessible to other agencies, governments, and the public by June 30, 1992. Wildlife and Fisheries shall hold the first round of public forums by January 31, 1992, and report back to the Authority on the forums by June 30, 1992.

H-6. Field Investigations

State resource agencies shall increase their efforts related to field work needed for management of habitats associated with aquatic systems. This effort is not designed to establish any new programs, but rather to support existing programs

and help them more effectively protect Puget Sound fish and wildlife habitat. Federal agencies concerned with habitat management are encouraged to increase their work in the field and to coordinate with ongoing state and local efforts.

The Department of Natural Resources shall increase field investigations and environmental review related to the leasing of aquatic lands. Specific tasks include:

- a. Review NPDES permit applications;
- b. Perform SEPA review of lease applications;
- c. Inspect and evaluate mitigation projects; and
- d. Ensure compliance with the environmental conditions stipulated in lease agreements.

The Department of Fisheries shall:

- a. Research and evaluate the effects of permitted (HPA) activities on aquatic communities and fish habitat;
- b. Devise standard requirements for HPA permitted activities based on research results and monitor consistency of HPA requirements; and
- c. Inspect and evaluate mitigation projects.

The Marine Fish Division (Fisheries) shall:

- a. Research and identify important marine habitats based on trophic studies; and
- b. Incorporate the research results in its HPA review process.

The Department of Wildlife shall:

- a. Conduct field inspections related to HPA permit applications;
- b. Ensure compliance to the environmental requirements of the HPA permit and monitor consistency of HPA requirements; and
- c. inspect and evaluate mitigation projects.

The Department of Ecology shall:

- a. Coordinate aquatic habitat protection efforts within its wetlands, shellfish, and nonpoint programs.

Target Date: Agencies shall begin work on this element on July 1, 1991.

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

LEGISLATION REQUIRED

1992 Session

1. Coordination with DCD on critical areas guidelines (H-1).
2. Tasks 1, 2, 5, and 7 of the Habitat Task Force (H-2).

Recommended legislation from Habitat Task Force (H-2) as described in task 7.

ESTIMATED COST

The following table shows biennium costs for implementation of the Habitat Protection Program by element. Full implementation of the program would cost \$4.1 million during the 1991-1993 biennium, \$3.4 million for the 1993-1995 biennium, and \$3.5 million for the 1995-1997 biennium.

The Habitat Task Force (H-2) is estimated to cost \$455,643 in the 1991-1993 biennium, \$200,000 of which is dedicated to the development of inventory protocols (H-2, task 4). Significant expenditures are needed for both staff and equipment to carry out inventory programs such as DNR's Natural Heritage Program Marine Inventory, which would help identify potential marine natural area preserves, and Fisheries' program to identify important marine fish habitat and to enter the data onto a GIS system. This element (H-3) is estimated to cost \$1.4 million in the first biennium. Implementation of element H-6 (Field Investigations) requires the appropriate agencies to hire the equivalent of 13 full-time employees (by the end of the first biennium) to perform the activities outlined in the element at a cost of \$1.4 million per biennium. HPA permit applications may increase with regional growth so more staff may be required for permit review in the future.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Habitat Protection

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
H-2 Habitat Task Force	\$0	\$15,000	\$434,536	\$0	\$0
H-3 Data Base and Inventory	\$0	\$0	\$1,442,955	\$1,363,168	\$1,563,168
H-4 Habitat Education Strategy	\$0	\$0	\$905,972	\$872,198	\$772,198
H-5 Public Involvement	\$0	\$0	\$71,829	\$69,662	\$69,662
H-6 Field Investigations	\$0	\$0	\$1,278,942	\$1,244,496	\$1,244,496
TOTALS	\$0	\$15,000	\$4,134,234	\$3,549,524	\$3,649,524

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
U.S. Army Corps of Engineers	\$0	\$0	\$11,746	\$0	\$0
Department of Community Development	\$0	\$0	\$13,000	\$0	\$0
Department of Natural Resources	\$0	\$0	\$759,672	\$662,304	\$662,304
Department of Ecology	\$0	\$0	\$243,635	\$214,626	\$214,626
EPA Region 10	\$0	\$0	\$11,746	\$0	\$0
Local Governments	\$0	\$0	\$432,500	\$400,000	\$600,000
National Oceanic and Atmospheric Admin.	\$0	\$0	\$13,000	\$0	\$0
Parks and Recreation Commission	\$0	\$0	\$276,754	\$247,764	\$147,764
Puget Sound Water Quality Authority	\$0	\$15,000	\$44,254	\$37,932	\$37,932
Tribal Governments	\$0	\$0	\$22,750	\$0	\$0
U.S. Forest Service	\$0	\$0	\$11,746	\$0	\$0
U.S. Fish and Wildlife Service	\$0	\$0	\$79,280	\$58,726	\$58,726
Department of Fisheries	\$0	\$0	\$1,339,727	\$1,212,598	\$1,212,598
Department of Wildlife	\$0	\$0	\$874,424	\$715,574	\$715,574
TOTALS	\$0	\$15,000	\$4,134,234	\$3,549,524	\$3,649,524

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$400,000	\$400,000	\$500,000
Federal Funding Sources	\$0	\$15,000	\$127,518	\$58,726	\$58,726
Local Funding Sources	\$0	\$0	\$232,500	\$200,000	\$300,000
State General Fund	\$0	\$0	\$3,351,466	\$2,890,798	\$2,790,798
Tribal Funding Sources	\$0	\$0	\$22,750	\$0	\$0
TOTALS	\$0	\$15,000	\$4,134,234	\$3,549,524	\$3,649,524

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

SPILL PREVENTION AND RESPONSE PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION



Modern industrial societies depend on large volumes of gasoline, motor and heating oils, solvents, and other hazardous substances to function. These substances are routinely transported and stored in huge quantities, and can cause tremendous environmental damage when accidents happen.

Just after midnight on Good Friday, March 24, 1989, the tanker *Exxon Valdez* (loaded with 50 million gallons of Prudhoe Bay crude) hit Bligh Reef in Alaska's Prince William Sound. The *Valdez* spilled approximately 10.8 million gallons of oil, the largest spill ever in U.S. waters. Tens of thousands of birds, otters, and other wildlife were killed. Thousands of miles of beaches were coated with oil. Over \$2 billion has been spent on cleanup, but the damage remains. No issue is more central to the water quality of Puget Sound than the prevention of an *Exxon Valdez* size spill. Response capabilities are overwhelmed by any large spill and fail to significantly reduce environmental damage.

Puget Sound is no stranger to spills of oil and other hazardous substances. In November 1985 jet fuel spilled into Des Moines Creek, killing fish and other organisms in four miles of stream. The spill eventually reached Puget Sound. In that same year, over 75,000 gallons of a toxic chemical spilled into Hylebos Waterway in Tacoma. In December 1985 the tanker *Arco Anchorage* enroute from Valdez, Alaska, to a refinery at Cherry Point, Washington, ran aground near Port Angeles. The vessel spilled over 200,000 gallons of crude oil, fouling Dungeness Spit and Ediz Hook. In 1988 the barge *Nestucca* collided with the tug *Ocean Services* and spilled 231,000 gallons of fuel oil off the coast of Washington at the mouth of Grays Harbor. The slick travelled as far north as Vancouver Island. Oil was found on Dungeness Spit and the San Juan Islands. Over 10,000 birds died as a result of the spill.

Numerous minor spills occur every year in Puget Sound. Such spills have obvious potential for significant water quality impacts, both short and long term. When a spill occurs, the oil or other hazardous substance may remain at the surface of the water where it is encountered by marine birds, marine mammals, fish and shellfish eggs and larvae, and other organisms; it may be consumed or absorbed by certain organisms and enter the food chain; it may sink to the bottom of the water body where it can contaminate sediments or, in the case of oil, smother organisms; and it may remain suspended in the water column where it can be encountered by fish and fishermen. Bird and mammal mortality, fish

kills, and fouled beaches are dramatic acute effects of spills. The chronic and long-term effects have not yet been determined.

Spills of oil and hazardous materials in Puget Sound are violations of both federal and state law. Under the Clean Water Act, the party causing a petroleum spill is responsible for cleaning it up and paying the costs of doing so. The federal CERCLA (Superfund) statute assigns the same responsibilities for spills of other hazardous materials. Cleanup efforts are conducted pursuant to national, regional, and state contingency plans, which identify what is to be done by whom in the event of a spill. The U.S. Coast Guard is the lead agency responsible for spill response in the marine waters of Puget Sound, with state and other federal agencies and local and tribal governments performing a secondary role. The Environmental Protection Agency takes the lead for inland spills.

Incidents like the *Arco Anchorage* and *Nestucca* spills have pointed out several areas of confusion and areas where improvements are needed in spill response. These include: reporting procedures, the role of local authorities, the use of volunteers, damage assessment methodologies, and wildlife rescue and rehabilitation. Other issues related to spill prevention and response have arisen with subsequent spills, including tanker and barge design modifications, operator training, and financial responsibility.

Some of these issues have been addressed by recent legislation. In 1989 the Washington State Legislature passed SHB 1853 amending the state Water Pollution Control Act (90.48 RCW) to speed up damage assessment due to an oil spill when damages cannot be quantified at a reasonable cost. In such an event, compensation will be assessed at between \$1.00 and \$50.00 per gallon of oil spilled. The 1989 Ocean Resources Management Act (RCW 88.40.020) requires that vessels over 300 gross tons which transport petroleum products as cargo have evidence of financial responsibility amounting to \$1 million or \$150 per gross ton, whichever is greater, to pay for spill cleanup and resource damage in the event of a spill. The 1990 state legislature authorized the establishment of a Maritime Commission (SSB 6701) to devise and fund an oil spill emergency response system. The system will focus on commercial vessels that lack spill response arrangements with a private contractor or industry cooperative, and will emphasize the first 24 hours of response. Other 1990 legislation (E2SHB 2494) requires spill response contingency plans for cargo and passenger vessels over 300 gross tons, tank vessels transporting oil in bulk, and facilities that store at least 10,000 gallons of oil.

Most legislative efforts to date have focused on spill response. In the aftermath of the *Exxon Valdez* spill, a common theme has arisen: the best strategy to minimize environmental damage due to spills is to prevent them. This theme was echoed by the 1990 state legislature:

Prevention is the best method to protect the unique and special marine environments in this state. The technology for containing and cleaning up a spill of oil or hazardous substances is in the early stages of development. Preventing spills is more protective of the environment and more cost-effective when all the costs associated with responding to a spill are considered. The legislature declares that it will continue to develop this first step in a comprehensive approach to protecting our unique and special marine environment by adopting measures in future sessions of the legislature to reduce the likelihood that a spill of oil or hazardous substance will occur (Section 1, E2SHB 2494).

PROGRAM STATUS

The Department of Ecology established the Oil Spill Advisory Committee in 1986 as required by Engrossed House Concurrent Resolution No. 19. The committee issued its report to the legislature in December 1986, listing 29 specific recommendations. Two recommendations did not require further action. Efforts were ongoing on two of the recommendations at the time the report was published: legislation passed in 1987 required that containment and recovery equipment be available during bunkering¹ and lightering,² and directed that an investigation of alternative methods of spill damage assessment be performed. The equipment was required for all bunkering and lightering operations after June 30, 1988. A report on damage assessment methods, by Dr. Thomas Leschine at the University of Washington, was completed. The state legislature passed new legislation revising damage assessment methods in 1989 (SHB 1853).

The remaining recommendations in the Oil Spill Advisory Committee Report were to be included in an Ecology workplan. The workplan was completed in March 1989. Ecology identified four recommendations as high priority items: (1) updating and clarifying the roles of different entities in the state spill contingency plan; (2) updating the spill response agreement with the Environmental Protection Agency (EPA) and developing a memorandum of agreement with the Division of Emergency Management (DEM); (3) requesting the Attorney General's office to investigate the legality of state and local governments designating bunkering areas at other than fixed facilities; and (4) developing a position on the use of dispersants. Ecology reports that the other recommendations either fell under other agency's jurisdictions, were already being addressed, or were not high priority issues.

Ecology staff have been working on some of these issues, but delays in implementing these recommendations were necessary because of increased focus on response activities as a result of the *Nestucca* and *Exxon Valdez* spills. As a result, Ecology has been updating the state contingency plan and participating in the States/B.C. Task Force. The States/B.C. Task Force was created after the *Nestucca* and *Exxon Valdez* spills and includes representatives from California, Oregon, Washington, Alaska, and British Columbia. The purpose of the Task Force is to address oil spill prevention and response issues of common interest to the western states and British Columbia.

The spills program at Ecology, after the *Nestucca* and *Exxon Valdez* spills, directed much effort to updating the state spill response contingency plan. As a result, staff time was not allocated to updating agreements with EPA, developing a memorandum of agreement with DEM, or pursuing action on designated bunkering areas. Ecology is currently working with other agencies on an environmental impact statement (EIS) for dispersant use.

Ecology issued a partial draft Contingency Plan for Spills of Oil and Hazardous Substances for review in January 1988. A second version of the Contingency Plan was produced in July 1988. Interim guidelines for Spill Response Standard Operating Procedures were issued in July 1989 and were updated in February 1990. Updates of the contingency plan are ongoing.

1 Bunkering refers to the refueling of vessels. Barges may transport fuel to large ships anchored offshore.

2 Lightering refers to off-loading cargo. Tankers that are too large to enter Puget Sound transfer oil into barges (near Port Angeles) which transport the oil to Puget Sound refineries.

Ecology has increased its inventory of spill response equipment, adding equipped vans, radio systems, and a boat for the Northwest Regional Office. Ecology has placed on-scene coordinators in the Northwest and Southwest Regional Offices to deal with spills and has acquired a damage assessment specialist.

The Puget Sound Water Quality Authority distributed a draft Spill Prevention issue paper in September 1989 as required in program element SP-3. The Spill Prevention and Response Advisory Committee (see SP-4) was instrumental in defining the issues to be addressed in the report. Four public hearings were held to gather public comment on the paper and to help make recommendations on how to improve spill prevention and response. The final paper was distributed in April 1990. Elements SP-3 and SP-4 have been completed.

As a result of the *Exxon Valdez* spill, the U.S Coast Guard has revised its own regional spill response contingency plan for the 13th District, which includes Puget Sound. On February 28, 1990, the Coast Guard, along with hundreds of representatives from other agencies, contractors, and citizens' groups, tested the contingency plan (and the joint contingency plan with British Columbia) during a simulated eight-million-gallon oil spill in Rosario Strait. The Coast Guard will evaluate the results of this simulated spill drill and revise the contingency plan accordingly.

The 13th District Coast Guard is also considering proposing several rules affecting Puget Sound. The proposed rulemaking includes: (1) extending the Puget Sound pilotage area to the entrance of the Strait of Juan de Fuca; (2) requiring two licensed officers on the bridge while in pilotage waters; (3) assessing vessel speed criteria for tankships with tug escorts; (4) requiring tug escorts for tankships with single propulsion mechanisms; (5) requiring emergency tow lines on barges; and (6) requiring emergency tow plans for tankers. On June 22, 1990, the Coast Guard held a public hearing in Seattle regarding these proposed changes. In addition, the 13th District Coast Guard has initiated rulemaking to delete provisions for Temporary Safety Traffic Lanes, establish prohibited fishing areas in several navigation channels including three ferry crossings, and require vessels fishing in or near the Traffic Separation Scheme to monitor VTS broadcasts and clear the traffic lanes at least 15 minutes prior to arrival of a transiting vessel.

On August 18, 1990, President Bush signed the Oil Pollution Act of 1990, which incorporated several elements of bills H.R. 1465 and S. 686 passed by the House and Senate respectively in 1989. The law requires double hulls on all tankers within 20 years. In addition, the statute raises limits of liability and financial responsibility evidence to \$1200 per gross ton, or \$10 million for vessels exceeding 3,000 gross tons. The act also creates a \$1 billion federal cleanup trust fund, establishes more stringent operational requirements for vessel staffing, increases the severity of penalties, and establishes an alcohol and drug abuse review program.

PROGRAM GOAL

To emphasize spill prevention strategies and enhance response capability in Puget Sound and its tributaries and to ensure that the spill prevention and response actions of state agencies are coordinated among themselves and with federal, local, tribal, and private efforts.

STRATEGY

The strategy for achieving this goal is to (1) identify the tools and resources needed to protect Puget Sound from spills; and (2) implement a comprehensive spill prevention and response program using current regulations and enacting new legislation if necessary.

**PROGRAM
ELEMENTS****SP-1. Oil Spill Policy
Implementation**

Ecology shall address the issues described below and implement key recommendations contained in the 1986 Oil Spill Advisory Committee Report to the legislature, the 1987 Ecology Spill Management Policy Recommendations report, the States/B.C. Task Force report (see SP-5), and any further recommendations generated by continuing policy analyses. In instances where the responsibility for implementing a recommendation properly rests with another entity, Ecology shall specify the responsible party and contact them directly concerning a specific task. When the responsibility rests with the legislature, Ecology shall prepare draft legislation. Issues of particular importance to be addressed include:

**Role of Local and Tribal
Governments**

Methods to maximize involvement of local and tribal governments shall be developed including using existing state and local emergency management channels. Local and tribal governments shall be requested to indicate what specific roles they could fulfill in spill prevention and response.

Role of Industry

An evaluation shall be made of industry's role in spill prevention and response, including but not limited to worker training and containment equipment.

Role of Volunteers

Guidelines shall be developed for the use of volunteers in spill response.

**Wildlife Rescue and
Rehabilitation**

Legal authorities and responsibilities shall be clarified. Funding, coordination and participation, and preparedness shall be addressed.

Equipment

Placement of and authority over public and private spill response equipment shall be analyzed with respect to maximizing the speed and effectiveness of spill response.

Cleanup Authority

Methods shall be examined to maximize Ecology authority to manage cleanup and damage assessment while recognizing the legitimate role of other entities.

Training

Careful attention shall be paid to training which ensures that the contingency plan is implemented correctly. Ecology shall cooperate with local governments, federal agencies, and industry in staging spill response drills. Post-drill debriefing and evaluation shall result in contingency plan modifications as needed.

Critical Resource Areas

An evaluation shall be made of whether information on priorities for protection of critical resource areas in Puget Sound is available and accessible. The need

for additional information and/or synthesis of existing information will be evaluated.

Cleanup Funding

An examination of current cleanup funding shall be made with recommendations for alleviating potential and existing shortfalls.

Target Dates: Ecology shall complete a workplan schedule to implement the key recommendations from the Oil Spill Advisory Committee report and the States/B.C. Task Force (see SP-5) report by February 1, 1991. Ecology's tasks are to be completed by dates established in the workplan. Annual progress reports shall be submitted by Ecology to the Authority. Spill response drills led by Ecology, federal agencies, and industry, with participation by local and tribal governments, shall occur on a regularly scheduled basis per the recommendations of the States/B.C. Task Force as adopted by Ecology.

[Status: The Oil Spill Advisory Committee report to the legislature was completed in December 1986. Ecology completed its Spill Management Policy Recommendations report in January 1987 and updated a workplan in March 1989. The report did not address several issues in a comprehensive manner, such as the role of local and tribal governments in spill response, the placement of spill response equipment, and means to alleviate potential shortfalls in cleanup funding. However, these issues have been or will be addressed in the state contingency plan. The workplan addressed four key recommendations from the Oil Spill Advisory Committee. As a result of the Nestucca and Exxon Valdez spills, the focus of Ecology's spill program shifted from the workplan to spill response planning. The States/B.C. Oil Spill Task Force final report and recommendations, produced largely through a cooperative effort by Ecology and Authority staff, was released in October 1990. The report included an implementation plan for the Task Force recommendations, which incorporated many recommendations of the 1986 Oil Spill Advisory Committee.]

Many of the issues delineated in SP-1 will be addressed in the state Contingency Plan for Response to Spills of Oil and Hazardous Substances (SP-2). These issues include the role of volunteers in spill response and methods of wildlife rescue; the roles and responsibilities of all federal and state agencies and local and tribal governments; the role of industry; specific operating procedures for major spills; a dispersant use policy; and new rules regarding the damage assessment methodology.

A detailed notification system has been developed for both local and tribal governments. 1990 legislation (E2SHB 2494) establishes a Wildlife Coalition which will address wildlife rescue and rehabilitation. Oiled bird rescue protocols developed through an Adopt-a-Beach project have been incorporated into a statewide plan being prepared by the Wildlife Coalition. E2SHB 2494 also calls for mapping of environmentally sensitive areas to be included in the state contingency plan.

In 1989 the Washington State Legislature passed SHB 1853 amending the state Water Pollution Control Act (90.48 RCW) to speed up the assessment of damages due to an oil spill when damages cannot be quantified at a reasonable cost. In such an event, compensation will be assessed at between \$1.00 and \$50.00 per gallon of oil spilled. Ecology is in the process of adopting new rules to coincide with this damage assessment legislation.]

SP-2. Contingency Plan and Spill Response

Ecology shall complete major revisions to the existing state Contingency Plan for Spills of Oil and Hazardous Substances, including sections on the roles and responsibilities of all federal and state agencies, local and tribal governments, and industry; specific operating procedures for major oils spills; a dispersant use policy; and disposal of recovered oil. The plan shall be consistent with the policy and roles of local, state, and federal entities involved with spill response. The plan shall be updated on an ongoing basis.

Spill response drills led by Ecology, federal agencies, and industry, with participation by local and tribal governments, shall occur on a regular basis per recommendation by the States/B.C. Task Force (see SP-5) as adopted by Ecology. Ecology shall perform post-drill analysis and debriefing and modify the contingency plan accordingly on an ongoing basis.

Target Dates: Major revisions to the state contingency plan regarding the roles and responsibilities of all federal and state agencies, local and tribal governments, and industry; specific operating procedures for major oils spills; a dispersant use policy; and disposal of recovered oil shall be completed by July 1991. Revision of the resource damage assessment guidelines shall coincide with adoption of new rules regarding damage assessment (July 1991). Contingency Plan updates shall be ongoing.

[Status: A partial draft contingency plan was distributed for review in January 1988. A second version of the contingency plan was produced in July 1988. A draft Operational Spill Response section was released in July 1989 and was updated in February 1990. An updated version of the training plan appendix was released in June 1990. Ecology has begun implementation of requirements under E2SHB 2494 to develop rules, review, approve, and enforce contingency plans required of oil shippers and handlers. Ecology has updated the local and tribal governments contact list, identified On-Scene Coordinators in the Northwest and Southwest Regional Offices, and hired one additional staff person in November 1987. A major oil spill simulation was conducted in Seattle on February 28 and March 1, 1990, involving hundreds of participating citizens, agencies, and contractors. The U.S. Coast Guard, Clean Sound Cooperative, Ecology and other agencies, and citizens participated in a spill response training exercise at Skyline Marina near Anacortes on September 12, 1990.]

SP-3. Spill Prevention and Response Report

[Element Completed]

[Status: This element called for the Authority to investigate and prepare a report containing recommendations regarding legislation, regulations, policies, and procedures that would decrease the likelihood of spills affecting Puget Sound. A draft issue paper on Spill Prevention: Means of Preventing Spills of Petroleum and Other Hazardous Substances in Puget Sound was completed by Authority staff in September 1989. The document was reviewed by the Spill Prevention and Response Advisory Committee (see SP-4), and four public hearings were held in October 1989 to gather public testimony. The final document, including recommendations for action, was distributed in April 1990.

The element also called for Ecology to hire staff to perform on-site inspections, to enforce spill control and counter measure (SPCC) plans, and to ensure SPCC plan compliance during NPDES permit review. Ecology did not receive funding to hire staff. See element SP-6.]

SP-4. Spill Prevention and Response Advisory Committee

[Element Completed]

[Status: This element called for the creation of a Spill Prevention and Response Committee under the management of the Puget Sound Estuary Program. The committee was assigned to review and comment on contingency plan updates, review and comment on Ecology's quarterly progress reports, and assist in the review of spill prevention issues (SP-3). The 17-member Spill Prevention and Response Committee was established in January 1989. Four meetings of the committee were held. The committee was instrumental in defining the issues to be addressed in the Spill Prevention issue paper (SP-3) and has reviewed Ecology's spill program workplan. Further efforts by the committee would likely duplicate the States/B.C. Task Force activities and those of the advisory committees that will be formed pursuant to E2SHB 2494.]

SPILL PREVENTION

SP-5. Implementation of States/B.C. Oil Spill Task Force Recommendations

The Authority adopts by reference the joint and Washington-specific recommendations presented in the 1990 final report by the States/B.C. Oil Spill Task Force. Ecology and other appropriate state agencies and local and tribal governments shall implement joint and Washington-specific recommendations which correspond to their jurisdiction, within a time period established by the Task Force implementation plan. The Authority requests that the U.S. Coast Guard, and other appropriate federal agencies implement recommendations which correspond to their jurisdiction.

In consultation with Ecology, the Authority shall review, modify if necessary, and adopt appropriate recommendations from future Task Force efforts.

Target Dates: Ecology and other appropriate agencies shall begin implementation of the adopted Task Force recommendations by July 1991.

[Status: This is a new element. The Task Force's final report was released in October 1990. Copies of the full final report and appendices are available from the Department of Ecology. The report contained joint and Washington-specific recommendations which encompass the following areas:

- *Vessel Traffic Reduction: Recommendations on petroleum conservation and review of alternative transportation options.*
- *Vessel Traffic Management: Recommendations on tug escorts for single propulsion tank vessels; tonnage requirements for tug escorts; vessel traffic service systems; near miss reporting system; tow cables; vessel safety measures; tow systems; navigation conflicts; and harbor safety committees.*
- *Vessel Design: Recommendations on double hulls and onboard navigation improvements.*
- *Personnel: Recommendations on petroleum facility worker training; mariner qualifications; tug crew training; crew manning requirements; dedicated tug crews; and pilot qualifications.*
- *Enforcement, Penalties, and Liability: Recommendations on strong sanctions; proof of financial responsibility; natural resource valuation; cost recovery; liability limits; Coast Guard enforcement; and enforcement staff.*

- *Regulatory Oversight: Recommendations on prevention plans; response plans; local participation; cleanup requirements; vessel inspections; subtidal land leases; and federal consistency.*
- *Education: Recommendation on prevention education.*
- *Transfer Operations: Recommendation on transfer operations review.*
- *Spill Response Enhancement: Recommendations on response training; wildlife rescue training and equipment; onboard response equipment; response drills; transfer containment; contingency plans; public involvement; mutual aid; incident command system; and state agency coordination.*
- *Research: Recommendation on research coordination.*
- *Structure and Process of the Task Force: Recommendation on annual meeting.*
- *Multi-state/Province Compact: Recommendation on interstate compacts.*
- *Studies and Other Recommendations: Recommendations on Marine Spill Response Corps review; information sharing; coordination of studies; and spill equipment updates.*
- *Fees and Incentives: Recommendations on a barrel tax, economic incentives, and environmental auditing.]*

SP-6. Spill Prevention Plans

EPA is encouraged to amend the Oil Pollution Prevention regulations (40 C.F.R. 112) to require that (1) above-ground oil storage tanks be built and tested in accordance with industry or other specified standards; (2) facilities plan how to react to a spill that overflows facility boundaries; and (3) storm water drainage systems be designed with controls to prevent oil from escaping through them.

Ecology shall require spill control plans and enforce the provisions of those plans for facilities that apply for NPDES permits [see element P-9 of the Municipal and Industrial Discharges Program].

Ecology is encouraged to use spill response staff for spill prevention when not actually responding to spills. Prevention activities could include post-event analysis and prevention education during on-site and community visits.

Target Dates: EPA should amend the Oil Pollution Prevention regulations by January 1993. Ecology shall require upgraded spill control plans for new permits and whenever NPDES permits are reopened for revision. Ecology shall begin incorporating upgraded spill control plans in permits not later than June 30, 1992. (See element P-9 of the Municipal and Industrial Discharges Program.)

[Status: This is a new element. See element P-9.]

SP-7. Training on Article 80 of the Uniform Fire Code

The Department of Community Development (Fire Protection Services Division) shall design and implement a program to train local fire department and fire district representatives, businesses, and industries in the provisions of Article 80 of the Uniform Fire Code. The program shall be designed to promote participation by appropriate volunteer fire departments. The focus of the training shall be on building design and storage requirements for hazardous

substances which will prevent release of those substances into the environment in case of an accident.

Target Dates: The Department of Community Development (Fire Protection Services Division) shall submit an outline of the training program and a training program schedule to the Authority by December 1991. DCD shall implement the training programs according to the schedule and submit semi-annual progress reports to the Authority.

[Status: This is a new element.]

SP-8. Review of State Spill Prevention Legislation

The Puget Sound Water Quality Authority shall establish a work group to identify gaps in local, state, and federal regulations which allow certain facilities that may produce, store, handle, or transport hazardous substances (including petroleum products) to operate without spill prevention requirements. The work group shall focus on the prevention of inland spills which may affect Puget Sound and the prevention of chronic on-water spills.

The work group should include representatives from local fire departments, local HazMat teams, businesses (including spill response companies), environmental groups, the Authority, Ecology, the Department of Community Development, EPA, NOAA, the Department of Labor and Industries, the Coast Guard, tribal governments, and other appropriate entities.

The work group shall evaluate whether state laws and regulations such as the Water Pollution Control Act, the Dangerous Waste Act, Worker Right-To-Know, the Uniform Fire Code, and the Washington Industrial Safety and Health Act, in conjunction with federal laws and regulations, adequately address spill prevention. The work group shall use the issue paper, *Spill Prevention: Means of Preventing Spills of Petroleum and Other Hazardous Substances in Puget Sound (SP-3)* as the basis for the evaluation. The work group shall examine the regulatory and statutory options to reduce small spills and mishandling of hazardous materials by businesses. The work group shall review past and ongoing investigations in order to eliminate overlap. The work group shall make specific recommendations on whether new legislation or regulations should be enacted.

Target Dates: The Authority shall establish the work group by February 1, 1991, and the work group shall complete a final report on legislative recommendations by October 1, 1991.

[Status: This is a new element.]

SP-9. Reduction of Conflicts in Navigation Lanes

Representatives of commercial and recreational fishing interests, the commercial shipping industry, the U.S. Coast Guard, the Washington Department of Fisheries, the Washington Department of Transportation, and tribal governments should implement the States/B.C. Task Force Washington-specific recommendation WA-2, which states "Initiate local negotiation efforts to eliminate navigation conflicts between fishing fleets and commercial vessels. Upon failure of negotiations, develop United States and Canadian Coast Guard regulations restricting vessel presence or movement in conflict areas."

The same representatives should meet during and immediately after implementation of the trial U.S. Coast Guard operational requirements for the 1990 fall commercial gillnet and purse seine salmon fishing season to discuss the effectiveness of the requirements on reducing navigation conflicts. Interested parties

should convene through the Puget Sound Users Forum unless another forum appears more appropriate after initial meetings. The U.S. Coast Guard should modify the its proposed rule to address concerns raised in the 1990 fall fishing season. Coast Guard requirements should not unequally favor or impair traffic lane use by either commercial and tribal fishing vessels or commercial shipping vessels. In addition, the Coast Guard should examine its authority to regulate tribal fishing operations.

Target Dates: Interested parties should be initially convened through the Puget Sound Users Forum by October 1990. Participants shall decide whether the Users Forum is the appropriate body to facilitate the negotiations. Negotiations should continue through October 1991.

[Status: This is a new element. In 1990 the 13th District Coast Guard established an operational requirement for the 1990 commercial gillnet and purse seine salmon fishing season. The requirement restricted fishing in traffic lanes to certain time periods, and encouraged commercial traffic lane users to restrict transits to specific time windows. The 13th District Coast Guard also has initiated rulemaking to: (a) eliminate use of Temporary Safety Traffic Lanes; (b) establish prohibited fishing areas in several navigation lanes; and (c) require vessels fishing in or near the Traffic Separation Scheme to monitor VTS broadcasts and clear the traffic lanes at least 15 minutes prior to arrival of a transiting vessel.]

SP-10. Vessel Safety Study

The Puget Sound Water Quality Authority shall contract with a qualified public or private entity to study whether speed limits or other safety measures should be imposed in Puget Sound. The study should address, but not be limited to:

- How speed affects the ability of escort vessels to assist tankers in trouble.
- How current and wind, in conjunction with vessel speed, affects vessel maneuverability.
- How speed relates to the risk of accidents during periods of low visibility.
- How local oceanographic conditions could be factored into safety measures.

The study should focus on vessels that transport hazardous materials (including petroleum products) in bulk, taking into account different vessel designs and sizes that transit Puget Sound. The study should evaluate whether temporary speed limits should be implemented during poor weather conditions and periods of reduced visibility and whether tank vessels should be restricted in Rosario Strait (or other areas) during poor weather or periods of reduced visibility. The analysis of the need for safety measures should include an examination and discussion of forecast data on future tanker traffic in Puget Sound.

The contracted entity shall prepare a report with recommendations regarding whether speed limits or other traffic restrictions should be imposed in Puget Sound. This report shall be conveyed by the Authority to the state Pilotage Commission and the U.S. Coast Guard. The Authority endorses U.S. Coast Guard participation in and funding of this study.

Target Dates: The Puget Sound Water Quality Authority shall develop a scope of work and enter into a contract with a qualified public or private entity for the study by August 1991. A final report shall be completed by December 1992. The Authority shall convey recommendations regarding the imposition of speed

limits or other traffic restrictions in Puget Sound to the Pilotage Commission and the U.S. Coast Guard by January 1993.

[Status: This is a new element.]

SP-11. Spill Prevention Education

Washington Sea Grant shall develop and implement a spill prevention education program for the commercial fishing industry and ports. The program shall target fishermen who fish or moor their boats in Puget Sound, and Puget Sound ports which support commercial fishing boat activity. Washington Sea Grant shall coordinate the program with spill prevention education of recreational boaters and marinas by the State Parks and Recreation Commission (MB-4). The program shall illustrate ways to reduce oil contamination of bilge water, reduce accidental spills of hydraulic fluid and other hazardous substances during routine maintenance, reduce spillage during refueling, and properly dispose of hazardous materials. In addition, the program will focus on ways to meet shoreside hazardous material handling and disposal needs of the targeted groups. This program shall be coordinated with actions taken by Sea Grant, Ecology, and Fisheries to implement program element EPI-5.1.

Target Dates: Washington Sea Grant, in consultation with Ecology and Fisheries, shall initiate program development in July 1991 and shall submit a workplan and program design to the Authority for review by October 1991. The educational program shall be implemented according to the workplan schedule. Sea Grant shall submit semi-annual progress reports to the Authority.

[Status: This is a new element.]

SP-12. Effects of Off-Shore Drilling on Puget Sound

The Authority shall support state efforts to assure that the effects of oil exploration off the coast of Washington on the Puget Sound are thoroughly evaluated before a federal lease-sale agreement is proposed. If a lease-sale agreement is pursued, the state shall emphasize the need for spill prevention and response planning during its negotiations with the Minerals Management Service (MMS).

Target Dates: Ecology shall brief the Authority on the status of offshore lease-sale agreements on a regular basis (at least twice per year).

[Status: This is a new element. The Minerals Management Service of the Department of Interior proposed to open the coastal areas of Washington and Oregon for gas and oil exploration. In June 1990 President Bush directed MMS to cancel lease sales off Washington and Oregon and postpone lease sales in the region until at least the year 2000 while environmental studies continue. Washington state has asked MMS to exclude certain areas from any future lease-sale agreement including buffer zones surrounding coastal estuaries, a large zone off the Olympic Peninsula, and sensitive habitat areas. The states of Oregon and Washington, the Northwest Indian Fisheries Commission, the Columbia River Intertribal Fisheries Commission, and MMS formed the Pacific Northwest Outer Continental Shelf Task Force to negotiate an agreement between the interested parties and MMS. The Task Force has issued a resolution signed by all members calling for a variety of environmental studies to be performed before discussion of a lease-sale agreement continues. These studies will take between five and seven years to complete and will cost \$28-35 million. The Secretary of the Interior adopted the resolution in June 1990.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Implementation schedule by Ecology (SP-1).
2. Contingency plan revisions by Ecology (SP-2).
3. Implementation schedule for States/B.C. Task Force recommendations (SP-5).
4. Amendments to EPA's Oil Pollution Prevention (40 C.F.R. 112) regulations (SP-6).
5. Training program outline and implementation schedule by the Department of Community Development (SP-7).
6. Legislative recommendations by work group (SP-8).
7. Vessel safety study recommendations (SP-10).
8. Spill prevention program design and workplan (SP-11).
9. Research findings, environmental impact statements, and proposed offshore lease-sale agreements (SP-12).

ESTIMATED COST

Increased costs for the Spill Prevention and Response Program reflect an expansion in scope from the 1989 plan. Costs are estimated to be \$2,211,483 for the 1991-93 biennium, decreasing to \$914,634 for the 1993-95 biennium and \$737,332 for the 1995 biennium. This decrease is a result of both high initial start-up costs and early deadlines.

The measures included in the adopted States/B.C. Task Force recommendations involve a large and complex array of costs which would be shared by numerous government agencies and private industries. Recommendations which involve general measures, such as increasing enforcement efforts, do not facilitate a simple calculation of costs. Therefore, the sum cost of implementing all of the recommendations remains unknown.

Training numerous individuals representing Puget Sound fire districts, businesses, and industries in the provisions of Article 80 of the Uniform Fire Code constitutes another large fraction of the program budget. This increase to the spill program budget reflects assimilation of hazardous material spill prevention into the program focus.

Additional private sector costs may result from other new program elements, such as spill prevention education. Improvements in spill prevention and response may counter private costs by reducing potential cleanup costs from spills.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Spill Prevention and Response

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
SP-0 Program Management ²	\$0	\$0	\$56,662	\$57,091	\$53,514
SP-1, 2 Policy/Contingency Planning ³	\$124,713	\$127,284	\$154,697	\$153,414	\$153,414
SP-3 Spill Prevention Report	\$0	\$154,012	\$0	\$0	\$0
SP-4 Spill Prevention Committee	\$0	\$20,000	\$0	\$0	\$0
SP-5 Implement. of States/BC Task Force Recommendations ⁴	\$0	\$0	\$63,218	\$63,218	\$63,218
SP-6 Spill Prevention Plans	\$0	\$0	\$304,542	\$286,168	\$286,168
SP-7 Training on Art. 80 UFC ⁵	\$0	\$0	\$1,273,167	\$360,653	\$186,524
SP-8 State Spill Prevention Legislation ⁶	\$0	\$0	\$34,459	\$0	\$0
SP-9 Reduce Conflicts in Nav. Lanes ⁶	\$0	\$0	\$12,232	\$12,232	\$12,232
SP-10 Vessel Safety Study ⁷	\$0	\$0	\$242,644	\$0	\$0
SP-11 Spill Prevention Education	\$0	\$0	\$177,284	\$88,642	\$88,642
SP-12 Effects of Off-Shore Drilling	\$0	\$0	\$13,239	\$12,780	\$12,780
TOTALS	\$124,713	\$301,296	\$2,332,144	\$1,034,198	\$856,492

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Ecology clerical costs for administration and coordination activities.

³ Includes Ecology, Wildlife, and Fisheries costs for meeting spill policy and contingency plan needs not funded under other state programs. Does not include local spill contingency plan costs as these are funded through a federal program.

⁴ These costs will be shared by many agencies and private parties. The Task Force has not yet quantified them so they will be added to the plan at a later date. There has been some concern expressed that these costs could be significant.

⁵ Primarily local government costs for fire service staff wages during training. Does not include costs to private businesses and volunteer fire department trainees.

⁶ Includes staff time for coordination and participation in meetings and reviews.

⁷ Includes a contract for a study during the 1991-93 biennium. Does not include vessel simulator costs.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Spill Prevention and Response

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Community Development	\$0	\$0	\$302,719	\$133,153	\$56,524
WA Department of Transportation	\$0	\$0	\$2,600	\$2,600	\$2,600
Department of Ecology	\$124,713	\$127,284	\$515,478	\$493,497	\$489,920
EPA Region 10	\$0	\$20,000	\$2,936	\$0	\$0
Department of Labor and Industry	\$0	\$0	\$3,250	\$0	\$0
Local Governments	\$0	\$0	\$975,000	\$227,500	\$130,000
National Oceanic and Atmospheric Admin.	\$0	\$0	\$3,250	\$0	\$0
Puget Sound Water Quality Authority	\$0	\$154,012	\$327,660	\$71,372	\$71,372
Washington Sea Grant	\$0	\$0	\$177,284	\$88,642	\$88,642
Tribal Governments	\$0	\$0	\$5,850	\$2,600	\$2,600
U.S. Coast Guard	\$0	\$0	\$2,350	\$2,350	\$2,350
Department of Fisheries	\$0	\$0	\$7,535	\$7,102	\$7,102
Department of Wildlife	\$0	\$0	\$6,232	\$5,382	\$5,382
TOTALS	\$124,713	\$301,296	\$2,332,144	\$1,034,198	\$856,492

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$177,284	\$88,642	\$88,642
Federal Funding Sources	\$0	\$20,000	\$8,536	\$2,350	\$2,350
Local Funding Sources	\$0	\$0	\$975,000	\$227,500	\$130,000
State General Fund	\$124,713	\$281,296	\$1,165,474	\$713,106	\$632,900
Tribal Funding Sources	\$0	\$0	\$5,850	\$2,600	\$2,600
TOTALS	\$124,713	\$301,296	\$2,332,144	\$1,034,198	\$856,492

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

MONITORING PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION



In order to assess the environmental conditions of Puget Sound, its resources, and the effects of human activities on them, it is necessary to collect baseline and long-term information on the water, sediments, biological populations, and habitats of the Sound. Population growth in the Puget Sound basin and associated urbanization, industrialization, and waste disposal have placed increasing burdens on the resources of the Sound. Managers need accurate information on the status of Puget Sound resources and changes over time, in order to protect the resources from harm. The public needs accurate information to ensure that pollution control programs are adequate. Also, the risk to humans from eating contaminated seafood from Puget Sound can only be assessed if managers have sufficient information on levels of contaminants in fish, shellfish and other seafood, and the rates at which those levels are changing.

The 1986 issue paper, *Comprehensive Monitoring of Puget Sound*, found that

There is no coordinated, integrated, comprehensive monitoring plan in operation or planned for Puget Sound. . . . Some programs of federal, state, and local agencies measured the conditions of water, sediments, and biological resources of the Sound, but these programs were generally not Soundwide and there was little cooperation or coordination among the programs. Substantial amounts of data continue to be gathered as part of specific, project-related intensive surveys, short-term or localized monitoring, and compliance monitoring. These programs are designed and implemented independent of one another. Discharge monitoring, intensive surveys, and other programs to assess the quality of Puget Sound water, sediments, habitat, and biological resources were not well integrated or coordinated.

A comprehensive monitoring program, the Puget Sound Ambient Monitoring Program (PSAMP) was developed between 1986 and 1988, and implementation has begun. The purpose of PSAMP is to determine the effectiveness of regulatory programs, evaluate long-term trends in environmental quality, and assist in resource management decisions. The designers of PSAMP built on existing monitoring efforts and added new monitoring parameters where they were needed. Preventing overlap and duplication of monitoring efforts is a major goal in implementing PSAMP.

Since the development of the monitoring program, the Authority has published an issue paper on pesticides. The issue paper found that there is some limited monitoring for organochlorine pesticides (most of which are banned from sale) in the waters, sediments, and biota of the Puget Sound basin, and almost no monitoring for new generation pesticides. Emphasis on monitoring of pesticides in Puget Sound is being included as a part of the monitoring program.

PROGRAM STATUS

The 1987 Puget Sound Water Quality Management Plan directed the Authority to form a Monitoring Management Committee (MMC) consisting of representatives of federal and state agencies, local and tribal governments, Canadian agencies, industry, the scientific community, and the public. The MMC was charged with developing a monitoring recommendation for the Authority, including: (1) goals and objectives for an ambient Soundwide monitoring program; (2) a technical design for ambient monitoring; (3) a data management system to handle all ambient monitoring data; (4) a cost estimate and identification of potential funding sources for the program; (5) opportunities for citizens' monitoring; and (6) a strategy for updating and integrating the Puget Sound Environmental Atlas with the monitoring program. This committee was established in October 1986.

Prior to the formation of the MMC, a monitoring design had been developed by a private contractor (Tetra Tech) under the direction of the Office of Puget Sound, Region 10, Environmental Protection Agency (EPA). This draft monitoring design was given to the MMC in November 1986 for review and further refinement.

The draft PSAMP design was further developed by the MMC and reviewed by a broad audience; workshops were held for the general public and for local and tribal government staff. Members of the Puget Sound Estuary Program (PSEP) Technical Advisory Committee (TAC) and other scientists in the Puget Sound area provided scientific review of the draft design in December 1987 and January 1988.

The MMC presented their final report and recommendation to the Authority in April 1988. The committee's report and ongoing refinements provide the basis for this program. The Puget Sound Water Quality Authority adopted PSAMP in April 1988.¹

As PSAMP entered the implementation phase, an institutional structure was formed to manage and coordinate the program. The PSAMP Steering Committee was formed in August 1988 and continues to meet monthly. The Steering Committee consists of representatives of the state Departments of Ecology, Fisheries, Health, Natural Resources, and Wildlife (the implementing agencies), the Authority, EPA, and local and tribal governments. Some limited implementation of PSAMP began in 1988, with additional monitoring beginning in 1989. A total of \$1.1 million of state and federal money is being spent on PSAMP in the 1989-91 biennium.

PSAMP accomplishments during 1988-89 include:

- Initiation of field sampling and laboratory analysis of sediments by Ecology, funded by \$1 million of state general fund money;

¹ Certain of the environmental variables examined by the MMC were not included in the PSAMP recommendation due to high costs, lack of adequate protocols, or logistic constraints. For example, sampling and analysis of freshwater sediments for toxics could not technologically be accomplished for a reasonable price and were therefore not included in the program. Many of the variables rejected for this initial PSAMP design should be given serious consideration in future iterations of the program. Funding levels and/or technological advances may allow for their addition to the program.

- Sampling and analysis of bottomfish and recreational fish for toxic chemicals in muscle tissue and liver histopathology (bottomfish only) by Fisheries, funded by \$200,000 of state general fund money;
- Sampling and analysis of shellfish tissue for bacterial and chemical contamination by Health, funded by \$160,000 of state general fund money;
- Redirection of current marine water column and freshwater efforts by Ecology;
- Sampling for paralytic shellfish poisoning by Health;
- Development of databases to manage PSAMP information by the Authority;
- Preparation of the first technical report on PSAMP sediment monitoring by Ecology, and the first Puget Sound Update annual monitoring report by the Authority; and
- Citizens' monitoring pilot projects funded through the Authority's Public Involvement and Education Fund (PIE-Fund).

The PSAMP Steering Committee developed a long-term strategy for the implementation of PSAMP which was presented to the Governor's Advisory Group on the Organization of the Puget Sound Water Quality Authority and the Legislative Budget Committee in October 1989. The strategy recommends the continued management of PSAMP by the PSAMP Steering Committee, with technical input from the MMC and subcommittees, and coordination by Authority staff.

During the 1990 legislative session, the Washington State Legislature added a section to the Authority's enabling legislation (Chapter 115, Laws of 1990, Section 9) which directs the implementation of PSAMP.

(1) In addition to other powers and duties . . . the authority shall ensure implementation of the Puget Sound ambient monitoring program . . .

(2) To ensure proper coordination of the ambient monitoring program, the authority may establish an interagency coordinating committee . . .

(3) Each state agency with responsibilities for implementing the Puget Sound ambient monitoring program, as specified in the plan, shall participate in the program.

PROGRAM GOAL

To implement the Puget Sound Ambient Monitoring Program (PSAMP). This program was designed to: (1) assist decision-making of agencies by characterizing and interpreting spatial and temporal trends and identifying problem areas; (2) take measurements to support specific program elements and measure the success of the Puget Sound plan by providing a permanent record of significant natural and human-caused changes in key environmental indicators over time; and (3) provide an ongoing assessment of the health of the Sound and the risk to human health from consuming Puget Sound seafood.

PROGRAM STRATEGY

The strategies for achieving this goal are to (1) establish an institutional structure to manage the monitoring program; (2) implement the monitoring program design, data management system, and quality assurance plan recommended by

the Monitoring Management Committee in April 1988; (3) collect, analyze, interpret, and report data in a manner that is useful to water quality managers and to the public; and (4) annually review the monitoring program to ensure that the most appropriate and cost-effective monitoring elements are included.

PROGRAM ELEMENTS

M-1. PSAMP Management Structure

The management structure for the Puget Sound Ambient Monitoring Program (PSAMP) shall consist of the PSAMP Steering Committee, the MMC, and the Authority. Staff, housed at the Authority, shall provide technical and administrative support to the program.

The PSAMP Steering Committee shall be chaired by the Authority and shall be composed of one representative from each of the implementing agencies, the Environmental Protection Agency (EPA), tribal government, and local government. Additional members shall be added in the future if deemed necessary by the Authority. The PSAMP Steering Committee shall be responsible for the overall coordination and management of PSAMP; coordination of agency activities; the review of technical and interpretive reports of PSAMP information; and the sanction of protocols for use in PSAMP. The PSAMP Steering Committee shall meet every month or as needed, and shall reach decisions by consensus.

The MMC shall be chaired by the Authority and shall consist of representatives from: the state Departments of Ecology, Fisheries, Wildlife, Natural Resources, and Health; Metro; local water and sewer districts and local public health officials; tribal governments; federal agencies including the National Oceanic and Atmospheric Administration, EPA, U.S. Fish and Wildlife Service, U.S. Geological Survey, Soil Conservation Service, and the Army Corps of Engineers; Canadian agencies; industry; shellfish growers; the scientific community; and citizen organizations.

The MMC shall act as the advisory group to the PSAMP Steering Committee. Proposed major changes to PSAMP shall be referred to the MMC by the PSAMP Steering Committee. Major changes include but are not limited to: addition or deletion of a PSAMP task or major sub-task; change in assignment of an implementing agency; setting funding priorities among PSAMP tasks; changes in protocols, sampling design, or criteria for locating sampling stations; and any significant technical issue upon which the PSAMP Steering Committee cannot reach agreement. The MMC shall meet twice a year or more frequently as needed.

If the PSAMP Steering Committee cannot reach agreement on major changes to PSAMP or other technical issues after consultation with the MMC, or on any other issue, the PSAMP Steering Committee as a whole, or any member individually, may refer the matter to the Authority for resolution.

The PSAMP Steering Committee and the MMC shall review and reassess the design of PSAMP on an annual basis.

The Authority shall facilitate agency cooperation among the state agencies implementing PSAMP; provide arbitration for interagency disagreements concerning PSAMP; provide and house the monitoring program staff; provide the

central data management functions; and distribute integrated, interpretive reports of PSAMP results.

The Authority shall: implement PSAMP Steering Committee and Authority decisions; coordinate the monitoring program; manage a central database system; provide technical review of field collection and laboratory analysis design; provide quality assurance review of PSAMP data; prepare technical assessments of PSAMP progress for the PSAMP Steering Committee; ensure that program revisions are coordinated among agencies; provide technical assistance to program participants in areas of data analysis and interpretation and field and laboratory activities; organize outside technical assistance, where needed, to help in review of monitoring data and program revisions; prepare integrated reports from data reports; and coordinate with other monitoring and research efforts.

Memoranda of agreement shall be negotiated between each implementing agency and the Authority in order to: ensure the implementation of PSAMP; allow for future modifications of the program, as needed; secure long-term stable funding for PSAMP; and develop a permanent record of data for Puget Sound. These agreements shall include commitments of work to be performed by one agency to support products of another agency, product reviews, consultation, and technical support.

When the Authority sunsets, those Authority functions associated with the management of PSAMP will be assumed by another organization. The PSAMP Steering Committee shall consult with the MMC and shall develop a recommendation for the long-term coordination and management of PSAMP prior to the sunset date of the Authority.

Target Dates: Memoranda of agreement shall be negotiated and signed between the implementing agencies and the Authority by September 1990.

[Status: The Monitoring Management Committee was formed in October 1986. The PSAMP Steering Committee was formed in August 1988. Memoranda of agreement were signed between the Authority and the Departments of Health, Fisheries, and Wildlife during 1988-89. The PSAMP Steering Committee presented its recommendation on the long-term implementation of PSAMP to the Governor's Advisory Group in October 1989.]

M-2. Puget Sound Ambient Monitoring Program (PSAMP)

The design of PSAMP, completed by the MMC in April 1988, and subject to future amendment, has been adopted for use in Puget Sound. The Puget Sound Ambient Monitoring Program shall collect and analyze samples and carry out surveys to determine the quality of the water, sediments, biological populations, and habitats of the Puget Sound basin, using protocols, quality assurance checks, data storage, and reporting procedures, as detailed in the PSAMP document.

The implementing agencies shall carry out specific assignments for implementing PSAMP, as directed by the PSAMP Steering Committee.

Initially, the state Departments of Ecology, Fisheries, Wildlife, Natural Resources, and Health have been chosen as the implementing agencies. Other federal

and state agencies, local and tribal governments, and other organizations may become implementing agencies in the future. Program tasks outlined in the 1988 MMC report shall be assigned to the implementing agencies as follows:

Ecology	Sediment, Marine Water Column, Freshwater
Fisheries	Fish
Wildlife	Birds, Marine Mammals
Natural Resources	Nearshore Habitat
Health	Shellfish

Changes to the program design shall require approval of the PSAMP Steering Committee in consultation with the MMC. The program shall include, at the least, sampling for sediments, water quality variables, biological populations, and habitat, within the limits of available funding.

Location, timing, and frequency of sampling stations in each program task shall follow the approach outlined in the MMC 1988 report and shall include a network of fixed and rotating stations for each task as specified in the MMC report.

Target Dates: The state Departments of Ecology, Fisheries, and Health shall continue implementation of PSAMP for those tasks for which funding is currently available, with implementation of additional tasks to begin by July 1, 1991. The Departments of Wildlife and Natural Resources shall begin implementation of PSAMP by July 1, 1991.

[Status: Sediment sampling took place during the spring of 1989 and 1990, with \$500,000 of 1987 plan funds. Ecology evaluated and modified the marine water column program to meet the goals of PSAMP in spring 1988; the freshwater program will be evaluated and modified to meet PSAMP goals during 1991. Fisheries carried out sampling and analysis for fish tissue chemistry and liver histopathology during 1989 and 1990. Health collected shellfish samples for bacterial and chemical analysis, with the help of citizen monitors, during 1989 and 1990. Sampling and analysis for paralytic shellfish poisoning is ongoing by Health. Waterfowl surveys by Wildlife are ongoing. DNR and EPA began a pilot project to inventory nearshore habitat by remote sensing during summer 1988.]

M-3. Citizens' Monitoring

The Authority shall develop a citizens' monitoring program to collect data which will supplement PSAMP and act as an educational and public involvement tool (see element ES-3 for further details on citizens' monitoring). At a minimum, at least one citizens' monitoring project shall be carried out each year.

Citizen monitors shall be asked to carry out portions of PSAMP tasks deemed appropriate by the monitoring program staff in consultation with the PSAMP Steering Committee. Implementing agency staff shall provide technical support and oversight for citizens' monitoring projects funded under this element. Authority staff shall provide volunteer management support for citizens' monitoring projects funded under this agreement.

Data collected under citizens' monitoring programs shall be subject to the same protocols and quality assurance checks as all other portions of PSAMP.

Target Date: Citizens' monitoring projects associated with PSAMP will be carried out on a continuing basis.

[Status: The Authority began implementation of a citizens' monitoring program in June 1988 through funding provided by the Public Involvement and Education]

Fund (PIE-Fund). During 1988-90 citizen monitors helped PSAMP investigators with the following projects: field checking of nearshore habitat; digging of clam samples for bacteriological and PSP analysis; and catching rockfish and Pacific cod for chemical analysis.]

M-4. Data Management and Quality Assurance

Data management and quality assurance for PSAMP shall be carried out through a centrally coordinated data management system. Responsibility for data storage and analysis shall be distributed among the implementing agencies and the monitoring program staff.

Each implementing agency shall develop and use data management systems, as specified in the PSAMP report, to manage all data generated under those tasks of PSAMP for which they are responsible. The monitoring program staff shall develop and maintain a central database of PSAMP data, as specified in the PSAMP report, including a computerized data inventory.

All data generated under PSAMP shall meet the quality assurance requirements specified in the PSAMP report and those subsequently ratified by the PSAMP Steering Committee.

The implementing agencies shall transfer data to the central database, following quality assurance checks. Standardized computer codes and formats specified by the PSAMP Steering Committee shall be used uniformly for all data transfers between and among the implementing agencies and the Authority.

The monitoring program staff, with the Department of Natural Resources Division of Aquatic Lands, shall create a Puget Sound Geographic Information System (GIS) as recommended by the PSAMP Steering Committee and adopted by the Authority in June 1989. The GIS shall include information on Puget Sound resources and environmental conditions at a scale appropriate for regional planning and analysis. The GIS shall be used to update the Puget Sound Environmental Atlas and to prepare PSAMP reports and analyses, as appropriate. The implementation of the GIS shall be coordinated to the maximum extent possible with the data management activities of the 1990 Growth Management Act, SHB 2929.

Target Dates: The state Department of Health shall have an operational data management systems by December 31, 1990. The state Departments of Wildlife and Natural Resources shall have operational data management systems by September 1, 1991. The monitoring program staff shall have an operational central database with enhanced reporting capabilities by July 1, 1991. The Puget Sound Environmental Atlas shall be updated by January 1, 1992, and the initial Puget Sound GIS created by June 1993, with additional data to be added later.

[Status: The state Departments of Ecology and Fisheries have operational data management systems for the sediment and fish tasks, and the other implementing agencies are in the planning stages for developing data management systems. Portions of the central database system has been completed and monitoring data are being loaded into it. Development will continue on the central database.]

M-5. Monitoring Reports

The implementing agencies shall analyze and report data for those tasks of the program for which they are responsible, as specified in the PSAMP report, in consultation with the monitoring program staff.

The implementing agencies shall each prepare an annual report which shall include a compilation of data, statistical analyses, interpretation, and recommendations for changes in the monitoring program design.

The monitoring program staff shall prepare an annual Puget Sound Update, which will be an integrated report, written for a non-technical audience. Puget Sound Update will include information supplied in reports from the implementing agencies and the monitoring databases. The PSAMP Steering Committee and the MMC shall review Puget Sound Update prior to its release.

Target Dates: Each agency implementing PSAMP shall prepare an annual technical report for the Authority. The first annual reports shall be completed by the state Departments of Ecology (for marine water column and freshwater monitoring), Fisheries, and Health in 1991. The first annual reports shall be completed by the state Departments of Wildlife and Natural Resources in 1992. The second Puget Sound Update shall be prepared by the monitoring program staff in 1991.

[Status: The state Department of Ecology completed the first technical report on sediments in February 1990. The first Puget Sound Update was released in May 1990.]

M-6. Additional Monitoring and Data Management Needs

The goals of PSAMP will be enhanced by the addition of appropriate intensive survey and other environmental data that are compatible with the data collected under PSAMP. The PSAMP Steering Committee shall consult with state and local agencies concerning the applicability of their intensive survey and other environmental data to PSAMP. The state Departments of Ecology and Health, and other state agencies; EPA, the U.S. Navy, and other federal agencies; Metro and other local and tribal governments shall collect and store information from intensive surveys, to the maximum degree feasible, according to sampling and analysis protocols specified by the PSAMP Steering Committee. Ecology, Health, and other agencies as appropriate, shall, to the maximum extent practicable, transfer appropriate intensive survey and other environmental information to the central database at the request of the monitoring program staff. Transfer of the information shall be accomplished using data transfer formats developed under element M-4.

Collection and storage of information in a manner compatible with PSAMP is addressed for compliance monitoring surveys in elements P-8 and P-17; for contaminated sediment inventories in S-8.1; for nonpoint monitoring in elements NP-7.2 and MB-7; for shellfish monitoring in elements SF-3 and SF-5; and for wetlands evaluation in elements W-2 and W-6.

Target Date: Ecology, Health, and other agencies shall use PSAMP protocols on an ongoing basis. Intensive survey data shall be stored in compatible format by Ecology and Health by January 1, 1991, and by all other agencies by July 1, 1991.

[Status: Several federal and state agencies require that data submitted to them be collected and stored using the protocols and data formats specified by PSAMP. These agencies and their activities include: contractor data required by EPA; data entered into Ecology's sediment management unit database; and data collected by watersheds under the nonpoint rule (Ecology nonpoint program).]

M-7. Evaluation of PSAMP

In order to ensure that PSAMP remains a necessary and cost-effective program that generates data useful to scientists and water quality managers, periodic evaluations of the program shall be conducted. Five years after the start of the program and every three years thereafter, the PSAMP Steering Committee shall identify an independent organization with appropriate technical expertise to evaluate PSAMP. The independent organization shall prepare a report for the PSAMP Steering Committee which evaluates: (1) the effectiveness of PSAMP sampling, analyses, and data management in meeting program goals; (2) the degree to which quality assurance requirements are met and are effective in generating high-quality data; (3) the degree to which PSAMP reports are effective and appropriate in meeting the program goals; (4) the continuing need for PSAMP sampling and analysis tasks, parameters, sampling frequencies, and station locations; (5) the degree to which PSAMP is being implemented according to the overall design strategy; and (6) the degree to which PSAMP results are used in water quality management decisions. The report shall also make recommendations for improvements to the program including the addition or deletion of monitoring tasks.

Target Dates: First evaluation starts by July 1994 with report due to the PSAMP Steering Committee by December 1994.

[Status: There will be no activity under this element until FY 1994.]

M-8. Pesticides Monitoring

A technical subcommittee to the MMC, consisting of representatives with expertise in pesticides from the Departments of Ecology, Health, Wildlife, Fisheries, Agriculture; Washington State University and Western Washington University research faculty; EPA; the U.S. Fish and Wildlife Service; the Soil Conservation Service; conservation districts; and other organizations as appropriate, shall be convened. The technical subcommittee shall (1) coordinate and focus ongoing pesticides monitoring activities in Puget Sound; (2) evaluate the need for additional monitoring of pesticides in Puget Sound; and (3) make recommendations to the MMC for the inclusion of pesticides monitoring in selected tasks of PSAMP. Some pesticides monitoring needs that the technical subcommittee should focus on include:

- The monitoring of potential point and nonpoint sources of urban/suburban pesticides including sewer and storm drain outfalls and highway runoff; and
- The monitoring of ambient levels of pesticides in Puget Sound sediments and organisms to determine long-term changes in environmental concentrations.

Target Dates: The technical subcommittee shall be convened by July 1, 1991, and shall make recommendations on pesticides monitoring to the MMC by November 1991.

[Status: This is a new element.]

MAJOR PUBLIC ACTIONS

None.

LEGISLATION REQUIRED

None.

ESTIMATED COST

Development of the monitoring program cost approximately \$0.5 million during the 1987-89 biennium, including participation by members of the MMC and Authority staff time. Individual agencies and organizations contributed their staff time for participation on the MMC, while Authority staff time devoted to the monitoring program was largely funded by the Environmental Protection Agency. This does not include the costs of earlier reports prepared by EPA and NOAA that provided the basis for the MMC work.

During 1987-1990, portions of the planning and startup costs for PSAMP were funded by EPA: development of the central Puget Sound database, coordination of the program, protocol development, and characterization of nearshore habitat. \$500,000 in state general fund money was directed toward startup and annual baseline monitoring of sediments beginning in fiscal year 1989. During the 1989-91 biennium, an additional \$400,000 of state general funds were allocated to PSAMP to carry out some limited fish and shellfish tissue analysis of contaminants, some liver disease analysis of bottomfish, citizens' monitoring coordination, and overall program coordination.

Full funding for the monitoring program will cost \$3.5 million a year to implement (\$7.0 million over the biennium), with additional startup costs of \$0.4 million incurred over the first one to two years. Field sampling and laboratory analysis of sediment, water quality, and biological population samples constitute the most costly element of the program, with an annual cost of about \$3 million. Cost estimates are shown in the following table, which includes costs for: field sampling, laboratory analysis of samples, coordination and management of the program, providing a central data management system, developing a Puget Sound GIS, coordination of a citizens' monitoring program, development and maintenance of individual agency data management systems, implementation of quality assurance procedures, and production of technical and public-release reports.

Modification of state agency monitoring programs has reduced the need for new money for the monitoring program by \$245,000. Cost savings (as well as educational benefits) are also proposed through the involvement of the public in collecting samples at several locations around the Sound, although there are costs associated with running a citizens' monitoring program.

Total funding available for PSAMP from all sources during the 1989-91 biennium is approximately \$1.1 million per year.

No significant private sector costs have been identified for this program, with the exception of staff time provided by representatives of the private sector who serve on the Monitoring Management Committee. Increased monitoring costs for dischargers are addressed in the Municipal and Industrial Discharges Program.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Monitoring

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
M-1 PSAMP Management Structure	\$279,863	\$549,500	\$297,234	\$297,234	\$297,234
M-3 Citizens' Monitoring	\$0	\$57,042	\$265,338	\$215,338	\$215,338
M-6 Additional Monitoring and Data Mgt.	\$0	\$0	\$232,158	\$228,612	\$228,612
M-7 Evaluation of PSAMP	\$0	\$0	\$0	\$80,000	\$0
M-8 Pesticides Monitoring	\$0	\$0	\$25,272	\$25,272	\$25,272
M-2, 4, 5 Ambient Monitoring and Data Management	\$496,382	\$1,870,680 ²	\$6,736,491	\$6,342,617	\$6,242,618
TOTALS	\$776,245	\$2,477,222	\$7,556,493	\$7,189,073	\$7,009,074

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Federal Funding Sources	\$177,000	\$680,300	\$136,874	\$136,874	\$136,874
Local Funding Sources	\$13,842	\$7,690	\$5,200	\$5,200	\$5,200
Private Funding Sources	\$0	\$0	\$7,800	\$7,800	\$7,800
State General Fund	\$578,685	\$1,781,768 ²	\$7,404,019	\$7,036,599	\$6,856,600
Tribal Funding Sources	\$6,718	\$7,464	\$2,600	\$2,600	\$2,600
TOTALS	\$776,245	\$2,477,222	\$7,556,493	\$7,189,073	\$7,009,074

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$0	\$0	\$2,600	\$2,600	\$2,600
Cooperative Extension	\$0	\$0	\$3,444	\$3,444	\$3,444
Department of Natural Resources	\$3,706	\$44,000	\$1,041,882	\$818,257	\$718,258
Department of Health	\$3,144	\$160,000	\$672,222	\$654,472	\$654,472
Department of Ecology	\$507,782	\$1,456,680 ²	\$3,563,653	\$3,410,422	\$3,410,422
EPA Region 10	\$27,000	\$14,000	\$69,298	\$69,298	\$69,298
U.S. Soil Conservation Service	\$0	\$0	\$2,600	\$2,600	\$2,600
Local Governments	\$13,842	\$7,690	\$5,200	\$5,200	\$5,200
National Oceanic and Atmospheric Admin.	\$0	\$0	\$6,500	\$6,500	\$6,500
Private Groups	\$0	\$0	\$7,800	\$7,800	\$7,800
Puget Sound Water Quality Authority	\$208,667	\$566,626	\$769,894	\$838,580	\$758,580
Tribal Governments	\$6,718	\$7,464	\$2,600	\$2,600	\$2,600
U.S. Forest Service	\$0	\$0	\$2,350	\$2,350	\$2,350
U.S. Navy	\$0	\$0	\$58,726	\$58,726	\$58,726
Department of Fisheries	\$2,502	\$210,000	\$942,854	\$942,854	\$942,854
Department of Wildlife	\$2,884	\$10,762	\$402,270	\$360,770	\$360,770
Western Washington University	\$0	\$0	\$2,600	\$2,600	\$2,600
TOTALS	\$776,245	\$2,477,222	\$7,556,493	\$7,189,073	\$7,009,074

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Includes \$490,000 used by Ecology for monitoring fresh water and marine water column. Ecology does not count this as part of its plan implementation budget.

RESEARCH PROGRAM

PROGRAM ELEMENT DIRECTORY

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R-3. Research Priorities	99

PROBLEM DEFINITION



Research¹ is essential for understanding Puget Sound and its associated watersheds and for developing management options for the long-term protection of the Sound. Research and monitoring together form the technical underpinning of the plan. Research provides a basic understanding of conditions and processes. Monitoring then establishes baseline conditions and determines trends in them. In turn, research explores and confirms the processes and relationships that underlie monitoring's findings. And finally, research provides the techniques for developing accurate, practical, and cost-effective methods of monitoring and sample analysis.

The development of a comprehensive and coordinated program of research for the management of Puget Sound is still in its infancy. Although much research on the physical and biological systems of Puget Sound has been completed, there are significant questions to be resolved. For example:

- We know less about the shallow nearshore zone, the southern and northern portions of the Sound, and the embayments than about the deep main basin of the Sound;
- We know very little about the natural variability in the living populations of the Sound; and
- We know very little about the biological and geochemical processes that transform toxic chemicals in the Sound and control their fate and toxicity.

Moreover, current research efforts in Puget Sound suffer from a variety of long-standing drawbacks which seriously reduce their effectiveness. For example, at present funds for most of the research conducted on Puget Sound are administered by federal agencies or by state program offices that were set up as the regional managers for federal program funding. None of these agencies claim responsibility for Puget Sound as a whole or view their primary objective as the support of research. Rather, research and contract studies are funded specifically to provide information that supports an agency's ability to carry out its mission, and as a result their scope is necessarily limited to the agency's perspective. Comparatively little research is done that looks at the cumulative effects of decisions on the Puget Sound ecosystem as a whole.

On some occasions the goals of various agencies have been combined in the same research project due to communication among funders, regulators, and researchers involved in the Puget Sound Estuary Program (PSEP) and other formal and informal arrangements. Interagency coordination by PSEP's technical Advisory Committee, for example, has resulted in the funding of applied re-

¹ Scientific investigation in which a hypothesis, idea, or assumption is developed and tested through systematic collection and objective analysis of data.

search projects widely recognized as essential to our understanding and management of water quality problems. However, producers, users, and funders of research have only recently addressed the need for a mutually acceptable set of goals and priorities for research in Puget Sound. For the most part the system has consisted of a fragmented pattern of agency-sponsored, short-term studies. These studies need to be augmented by coordinated research projects which: (1) provide a clear connection between the research agenda of the scientific community and the information needs of managers, regulators, and those involved in decisions to manage the Sound; and (2) include investigations that increase our general knowledge of the Puget Sound system but that are beyond the purview of a single agency.

The current system by which scientific information is dispersed throughout the research community also needs revision. It often falls short of delivering research results to resource managers, policymakers, other involved parties, and the general public in a form and time frame that allows them to be useful in decision-making. A lack of public forums for the exchange of information on Puget Sound between researchers and those who may make use of research results has caused difficulties and misunderstandings in both communities.

The problems encountered in the present research system distill down to two questions: (1) How can we ensure that the effort and resources that are devoted to research are commensurate with and appropriate for the problems we will confront in managing the Sound? and (2) How can we ensure that the results of existing research are understood and available for the decisions that we make on Puget Sound water quality?

PROGRAM STATUS

The Committee on Research in Puget Sound was established in February 1987 and asked to make recommendations to the Authority on eight issues important to Puget Sound research, including: research priorities, institutional needs, data management, research reserves, and the publication and dissemination of research results. The committee was composed of 20 representatives of academic institutions, state and federal agencies, the business community, agriculture, environmental groups, and private research organizations. It organized itself into two subcommittees which met monthly to accomplish their tasks.

The Subcommittee on Establishing Research Priorities developed a process for establishing priorities and then, beginning in July 1987, used the process to generate the first list of research priorities. This ranked list of priorities was included in the committee's final report.

The Subcommittee on Institutional Issues identified the desired functions and characteristics of an institutional structure designed to address the current problems related to a (1) coordination and funding of research; (2) dissemination of research results; and (3) the use of research results in decision-making. The subcommittee then reviewed the structure, responsibilities, and operation of existing institutions in the Puget Sound region relative to these functions. They also looked at institutions elsewhere in the country to see what could be learned and adapted from those institutions to suit the specific needs in Puget Sound. Based on this analysis the research committee developed a recommendation for a new institutional structure, the Puget Sound Research Foundation. The proposed foundation was a unique combination of the successful features of the other institutions.

In the 1989 plan the Authority adopted a list of four long-term research goals and six research priorities for FY 1989-91. This list is to be reviewed, revised as

appropriate, and readopted on a biennial basis. A seventh area of research, having to do specifically with pesticides, was identified by an issue paper released in 1990. This paper identified two functions for the research committee: the coordination and focusing of research activities on the fate of pesticides in Puget Sound waters, and the identification of high-priority pesticide research topics. While the agricultural aspect of the pesticide question is covered by the list of research priorities for FY 1989-91, the more significant factor—urban usage—is not.

In 1989 the Authority forwarded a position paper on the creation of a Puget Sound Foundation to the Governor's Advisory Group on the Organization of the Puget Sound Water Quality Authority and to staff of the Legislative Budget Committee. This report was based on the combined recommendations of the research committee, the Education and Public Involvement Advisory Group, and the Puget Sound Finance Committee, and for the first time combined the long-term goals and priorities of the education and research programs. The revisions to the authority's authorizing legislation (Chapter 115 RCW, Laws of 1990) enabled the Authority to create the Puget Sound Foundation as a public non-profit corporation under Chapter 24.03 RCW.

The Authority also directed the research committee to convene meetings on Puget Sound research. The First Annual Meeting on Puget Sound Research was convened in Seattle on March 18-19, 1988. More than 700 people—researchers, water quality managers, and the public—attended. Scientists presented recent research results related to Puget Sound and explained the implications of their results. Also, the committee presented its final report at the meeting and received comments from a diverse panel of responders and from other meeting participants.

On June 9, 1989, the research committee sponsored a conference, A Briefing on Puget Sound Sediments. This one-day event attracted a capacity crowd of over 200 people from the public and a variety of disciplines and addressed both research findings and resource management implications of those findings.²

In September 1989 the members of the Puget Sound Estuary Program (the Authority, EPA, and Ecology) cosponsored the Forum on Puget Sound's Biological Resources: Status and Management. This two-day event gathered together researchers and resource managers to share concerns and information about the management of species ranging from geoducks and urchins to marine birds and mammals.

On November 15 and 16, 1989, the Authority and EPA cosponsored a technical workshop on the significance of sea-surface microlayer contamination as a potential health threat to natural resources and humans. The goal of a panel of experts was to clarify what is currently known about microlayer processes and characteristics related to contaminant accumulation, transport, and biological exposure and effects.³

² The two-volume proceedings of the First Annual Meeting on Puget Sound Research, containing manuscripts of the papers presented, the executive summary of the committee's report, and transcripts of the panel discussions, is available at a cost of \$20.00 from PSWQA. The edited proceedings of the sediments briefing, the *Handbook on Puget Sound Sediments*, is also available upon request. Copies of both proceedings can also be found at most public libraries around the Sound.

PROGRAM GOAL

To establish and maintain a system of priorities and funding for, and dissemination of, research that (1) adds to our knowledge of the physical and biological systems of Puget Sound; (2) identifies causes and solutions of pollution problems; and (3) assists decision-making activities of regulatory and management agencies while stimulating creativity and excellence in research.

STRATEGY

The strategy for achieving this goal is to (1) maintain the Puget Sound Research Program in order to promote the coordination and funding of Puget Sound research; (2) establish a renewable list of priorities for sponsorship by the program; and (3) assist in making the results of research available for decision-making. The Authority shall coordinate the program and complete certain tasks within it, while assigning other tasks, and the long-term maintenance of the program, to the Puget Sound Foundation (see Foundation Program elements F-1 and F-2).

PROGRAM ELEMENTS

R-1. Puget Sound Research Program

[Completed portions of this element have been deleted.]

The Authority shall maintain the Puget Sound Research Program in order to provide a regional focus for the setting of research priorities, research sponsorship, and the dissemination of research findings related to Puget Sound and its watersheds.

The following functions of the Puget Sound Research Program shall be implemented:

1.1. Research Needs and Priorities

The Authority, in conjunction with the Puget Sound Foundation, shall manage a process that takes a comprehensive regional approach to identifying and setting priorities for Puget Sound research needs (including problems or processes occurring in watersheds draining into and affecting Puget Sound). Specifically, this process shall provide for:

- a. Interactions among scientists and agency managers in setting priorities;
- b. Involvement by agencies that support research in order to foster their use of the priority list in deciding which research to fund in Puget Sound; and
- c. Periodic updates of the priority list so that it is useful to federal and state agencies, local and tribal governments, industry, and other groups involved with Puget Sound in meeting their management needs.

The Authority and the Foundation shall encourage agencies, industry, and other organizations that fund research to consider the list of research priorities in their own process for allocating research funds.

³ Proceedings of this conference were published in May 1990.

1.2. Fund Raising

The Puget Sound Foundation shall initiate a funding development program to establish a permanent and stable funding base from industry and other private sources as well as from federal and state entities for support of the research program.

1.3. Research Grants Program

The Puget Sound Foundation shall establish and manage a competitive research grants program to support research on the priority list that is not adequately funded by government agencies or other sources. The Foundation shall solicit peer reviews of proposals submitted in each high-priority research area. Proposals shall be selected on the basis of established criteria, including, but not limited to: quality, significance of expected scientific contribution, importance to an affected Puget Sound resource, and cost. The program shall work cooperatively with agencies and tribal governments to allocate funds, including supporting basic or process-oriented research that may not be within a particular agency's mission but that is required to understand and use the results of applied research.

1.4. Translation and Dissemination of Research Results⁴

The Authority shall support timely dissemination and translation of Puget Sound research results useful to the public and resource managers. Specifically, the Authority shall:

- a. Establish a policy that research supported by the program should undergo peer review and where appropriate be published in technical and scientific journals;
- b. Support preparation of synthesis or review papers on key Puget Sound issues;
- c. Urge the preparation of short summaries for non-technical audiences of all reports arising from research conducted or funded by the program and the agencies committed to its implementation;
- d. Support the centralization and computerization of research findings by the submission of all research reports to recognized repositories and by updating and managing Sound Access, a computerized bibliography of Puget Sound literature;
- e. Publish an annual report summarizing progress on program-supported research and other activities;
- f. Sponsor conferences on Puget Sound research that include presentations on current research, discussion of the implications of the research, and an assessment of research priorities for the coming year;
- g. Sponsor technical forums for discussion of the scientific interpretation and management implications of research results; the forums should be designed to increase communication among researchers, resource managers, and other decision makers; and

⁴ This function shall be coordinated or integrated as appropriate with the Puget Sound Ambient Monitoring Program (PSAMP) and the Education and Public Involvement Program.

h. Communicate and provide educational opportunities to increase public understanding of how research contributes to the resolution of current and future issues related to water quality in Puget Sound.

The Puget Sound Foundation shall assume these translation and dissemination functions from the Authority as staff and funding allow.

1.5. Information Management

The Authority shall facilitate access to information dealing with Puget Sound that is not readily available through the open literature, particularly unpublished research and data. The Authority shall act as a broker between those having information and those needing it, including the public, the scientific community, regulatory and resource management agencies, and environmental and community groups. This function shall be coordinated with the data management functions of the Puget Sound Ambient Monitoring Program (PSAMP), which include the use of a central database of PSAMP data and the development of a computerized data inventory. The PSAMP data inventory will serve as a source of information on what computerized data are available and how they may be obtained.

The Puget Sound Foundation shall assume these information management functions from the Authority as staff and funding allow. In addition, the Foundation shall create a repository for and update information relating to research and education in Puget Sound, including the computerized bibliography Sound Access, the Puget Sound Geographic Information System (GIS), and a joint private sector/public sector technical library providing information on laws, regulations, standards, and compliance technologies.

1.6. Coordination With Other Programs

The Authority shall ensure that research and monitoring activities are coordinated. This includes reviewing the integrated technical report of PSAMP to identify research needs related to developing analytical and sampling methodologies or investigating questions raised by the monitoring results. In addition, the program shall coordinate to the greatest extent possible with research and monitoring programs including: the Puget Sound and other Estuary Programs, NOAA, watershed monitoring programs, and Timber/Fish/ Wildlife.

The Puget Sound Foundation shall assume these coordination functions from the Authority as staff and funding allow. In addition, the Foundation shall make available summary reports of PSAMP and the Puget Sound Research Program for use by the public after the sunset of the Authority.

1.7. Inventory and Recommendation of Research Reserves

The Puget Sound Foundation shall coordinate with the Natural Heritage Program of the Department of Natural Resources and others to inventory geographic areas that are reserved for research, e.g., the University of Washington areas at Friday Harbor and Shaw Island, Western Washington University's Shannon Point Marine Center, federal and state wildlife refuges and parks, the Padilla Bay National Estuarine Research Reserve, and other public and private preserves. The program shall recommend establishment of additional reserves if specific ecosystems are missing or underrepresented, either for use as reference areas for monitoring or for research.

Target Dates for R-1: This is an ongoing program. The transfer of the translation and dissemination (1.4), information management (1.5), and coordination (1.6) functions from the Authority to the Foundation shall occur as the Founda-

tion is able to take them on. The transfer will be completed in phases during the 1993-95 biennium.

[Status: The Puget Sound Research Program was established under the Authority in July 1989, to be managed as follows: (1) The Authority shall set policy and provide oversight of the program and its administration; and (2) The Committee on Research in Puget Sound shall recommend research priorities and sponsor forums on technical issues and other activities to foster translation and dissemination of research findings. The position of senior scientist as administrator/spokesperson, and the scientific and management councils mandated by the 1989 plan, were not created, but instead were incorporated into the organization of the Puget Sound Foundation.]

The first research priority-setting process was completed by the Committee on Research and documented in their final report in March 1988. The Authority adopted a list of long-term research goals and priorities for FY 1989-91 in the 1989 plan. Only minimal funding for the translation and dissemination portion of the program, was received in FY 1989-91.

The Committee on Research sponsored research conferences in 1988, 1989, and 1991, and the Authority cosponsored several forums on research topics in 1989 and 1990.]

R-2. Puget Sound Research Foundation

[Element Completed]

[Status: This element called for the Authority, in anticipation of its sunset, to commence the necessary steps to ensure the long-term functioning of the Puget Sound Research Program. The Authority was directed to draft legislation to establish the Puget Sound Research Foundation as an independent nonprofit corporation. This draft was to serve to foster discussion and was to be considered in 1989 by the Authority in conjunction with recommendations for long-term institutional solutions to protect Puget Sound (element PDI-1).]

The need to preserve the implementation of elements of the Puget Sound plan over the long term subsequently was recognized by other advisory groups, including the Education and Public Involvement Advisory Group (EPIG), the Monitoring Management Committee (MMC), and the Puget Sound Finance Committee. In 1989 representatives of these groups and the Committee on Research formed the Combined Committee for a Puget Sound Foundation and adopted a proposal to create a nonprofit corporation to coordinate and fund research and education in Puget Sound.

The foundation proposal was forwarded to the Governor's Advisory Group on the Puget Sound Water Quality Authority and to the Legislative Budget Committee staff for their consideration. In 1990 the Washington State Legislature authorized the Authority to create the Puget Sound Foundation as a public nonprofit corporation under Chapter 24.03 RCW. A description of the mission, organization, and functions of the foundation is found in the Puget Sound Foundation Program (elements F-1 and F-2).]

R-3. Research Priorities

The Authority and the Puget Sound Foundation together shall review, revise, and adopt a list of research priorities on a biennial basis. This list shall serve as a guide to agencies and the Puget Sound Foundation in their decisions to fund

research pertinent to Puget Sound. The long-term goals of the research program are to:

1. Understand the effects of conventional pollutants on Puget Sound and adjacent habitats.
2. Understand the effects of toxics on Puget Sound and adjacent habitats.
3. Understand the effects of adjacent habitat alterations on Puget Sound aquatic resources.
4. Understand and improve the effectiveness of environmental decision-making on Puget Sound.

The Puget Sound Research Program shall provide support under the research grants program for scientists to conduct research on these priorities. This support shall include appropriate funding and encouragement to ensure that research findings are communicated and translated into a form that is usable by decision makers. This should be accomplished through prompt publication of research reports (including short, non-technical summaries containing implications for management issues) in technical journals and in publications that are accessible to local government planners, agency staff, and others. The Puget Sound Research Program shall sponsor and convene forums, workshops, and conferences to discuss technical issues and the implications of the collected body of research information.

Target Dates: This list shall be reviewed, revised as appropriate, and readopted on a biennial basis.

[Status: The Authority adopted the following list of research priorities developed by the Committee on Research in Puget Sound for FY 1989-1991 in the 1989 plan:

1. *Develop background data on the effects of agricultural runoff on offsite water quality.*
2. *Characterize the input, cycling, and effects of nutrients in embayments and near-shore waters, and the relationship of these processes to activities in the watershed.*
3. *Identify and investigate biological effects in the sea-surface microlayer and other zones of contaminant concentration.*
4. *Develop a better understanding of the chemical and physical processes that control the fate and effects of chemicals introduced by effluents into Puget Sound.*
5. *Investigate the impacts of changes in water quantity on wetlands and the effects of wetlands on watershed hydrology.*
6. *Develop an understanding of regional wetlands functions and values, and develop objective criteria for their measurement and evaluation.*

A seventh area of research concerned with pesticides in Puget Sound has been recommended for inclusion in this list by the Authority. In the pesticides issue paper published in March 1990, the Authority assigned the Committee on Research the tasks of coordinating and focusing research activities on pesticides in Puget Sound, and identifying high-priority pesticide research areas. Research needs identified by the report included mechanisms and pathways of pesticide transport to surface waters and sediments, acute and chronic effects of pesticides on biota, and the

development of laboratory methods for detecting pesticides in environmental samples.]

**MAJOR PUBLIC
ACTIONS**

None.

**LEGISLATION
REQUIRED**

None.

ESTIMATED COST

Funding for the Research Program reflects the level of support from state and federal sources for the 1989-91 biennium, and the anticipated reliance on the public and private sectors for support of the Puget Sound Foundation.

The amount of funds available for the research grants portion of the Research Program (R-1) will depend upon the success of the Foundation in raising funds for research and education from federal appropriations and the private sector, and upon the apportioning of those funds to the research and education programs. These costs are not reflected in the plan budget details outlined below. In the 1989 plan it was anticipated that \$600,000 per year would be set aside for research grants for the first biennium, increasing to \$3 million per year for the second biennium and \$3.5 million per year for the third.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Research

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
R-1 Puget Sound Research Program	\$82,858	\$0	\$296,550	\$340,804	\$309,194
R-1, 3 Research Program and Priorities	\$0	\$96,000	\$0	\$0	\$0
R-2 Research Foundation	\$96,429	\$0	\$0	\$0	\$0
TOTALS	\$179,287	\$96,000	\$296,550	\$340,804	\$309,194

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Foundation	\$0	\$96,000	\$126,436	\$302,874	\$271,264
Puget Sound Water Quality Authority	\$179,287	\$0	\$170,114	\$37,930	\$37,930
TOTALS	\$179,287	\$96,000	\$296,550	\$340,804	\$309,194

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Federal Funding Sources	\$117,365	\$96,000	\$170,114	\$37,930	\$37,930
Private Funding Sources	\$0	\$0	\$126,436	\$302,874	\$271,264
State General Fund	\$61,922	\$0	\$0	\$0	\$0
TOTALS	\$179,287	\$96,000	\$296,550	\$340,804	\$309,194

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

EDUCATION AND PUBLIC INVOLVEMENT PROGRAM

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PROBLEM DEFINITION



Pollution prevention requires an ongoing commitment from an informed, involved public. Both education and public involvement are necessary components of a long-term management strategy for the Sound and its resources.

Education is necessary to foster public recognition of the Sound as a regional and national resource, and to stimulate public, governmental, and private sector support for the changes in lifestyle and financial commitment necessary to preserve the Sound. Education is necessary both as a supplement and an alternative to enforcement programs. More and more, education is recognized as the effective resource management tool to address those problems which result from individual actions such as improper disposal of wastes from households, automobiles, or boats.

An educational survey conducted by the Authority in 1986 revealed some significant deficiencies in education related to Puget Sound. Most education programs on water quality or the Sound were sporadic and without any sustained funding base. Very few agencies allocated staff or budget to education. There was little coordination among institutions, agencies, and programs in the region, resulting in conflicting or poorly targeted messages and inefficient use of educational resources. Although there were numerous curricula related to Puget Sound, there had been limited funds to train teachers in how to use them. The education strategy was developed in response to these needs.

Since 1986 agencies have allocated a few more resources toward education. The subsequent experience gained through such programs as the Authority's Public Involvement and Education Fund (PIE-Fund, described in EPI-8.1 below), the watershed committees set up under the nonpoint program, and the marine plastic debris program of the Department of Natural Resources have underscored the ongoing institutional challenges identified above:

- *Funding.* With some exceptions, the recent increase in water quality education programs has primarily been funded through the PIE-Fund and other Centennial Clean Water Fund grants. However, these funds are directed to short-term projects at the local level and are not available to state agencies (e.g., for interpretive centers) or for setting up long-term educational support for local governments, citizens, or industry.
- *Volunteers.* Because of global attention to the environment, local issues of growth management, and the attention gained through PIE-Fund projects, watershed committees, recycling programs, fisheries enhancement groups,

etc., many citizens are aware. They want opportunities to act on this awareness: beaches to clean up, curbside recycling options, household hazardous waste collection systems, streamside revegetation projects. Many local governments are not yet able to respond.

- *Cooperation.* Education is where agencies and local governments can wear the white hat and gain a friendly image. As a result, agencies often want to conduct their own education programs and deliver their own agency-identified messages. This can result in uncoordinated or conflicting messages to the public and poor use of the tax dollar: it is not cost-effective for each program to have an educator, or to set up its own system to deliver information.

If the state could advance the status of educational funding and cooperation among agencies, state agencies and local governments could greatly benefit from the energy and talent of volunteers and business and industry to protect and enhance the Sound.

Public involvement in actions to clean up and protect Puget Sound is important because the public can bring information, expertise, values, funding, and priorities to the decision-making process. Resource management programs which have not adequately educated or involved the public are often met with resistance or animosity, and some ultimately fail as a result.

Concurrent with the public involvement process, tribal governments can bring information, expertise, values, funding, and priorities to the decision-making process. Often tribes have either been excluded from public involvement or included in public involvement mechanisms simply as one of many public constituencies. Tribal sovereignty has been ignored by these practices. Agencies and local governments must increasingly find effective ways of developing programs in consultation with tribal governments as directed in the new Centennial Accord Between Federally Recognized Tribes and the State of Washington.

The 1986 Authority issue paper on Public Involvement in Water Quality Policymaking noted that the level of public involvement in decision-making processes related to water quality varies widely with the issue and the agency. Generally, staff time and training are not specifically dedicated to public involvement. Certain requirements for effective public involvement are generally not being met. These include: (1) timely, understandable, and complete notice of pending actions; (2) access early in any decision-making process; (3) ease of access to the process; and (4) response to citizens on how comments or recommendations are used.

Since the publication of the public involvement issue paper, the Authority has learned the importance of consultations with governments and constituency groups as an essential step in the development and implementation of the Puget Sound Water Quality Management Plan. The watershed planning process has also highlighted the need to gain consensus and resolve conflict in order to have an effective planning process. Generally, agencies do not have the staff resources to undertake extensive consultations, and staff are not trained to conduct consensus or conflict resolution processes.

PROGRAM STATUS

In its first two years, the Authority focused more formally on public involvement than on education. Based on the Authority's 1986 issue paper on Public Involvement in Water Quality Policymaking, a public involvement policy was defined

and included in the 1987 plan. Public involvement is defined as an ongoing dialogue between interested and affected parties and decision makers in all steps in the decision-making process. The public involvement policy must be followed by all state and local agencies in activities related to implementing the plan and will be considered in evaluating local and state agencies' compliance with the plan.

Since the adoption of the Puget Sound Water Quality Management Plan in 1987, a major activity of the Authority has been the funding of a series of demonstration projects through the Public Involvement and Education Model Projects Fund (PIE-Fund). As of June 1990, 101 contracts have been awarded to local groups for a total of about \$2 million. These projects have increased the awareness of water quality, wetlands, and wildlife issues in many communities, and have contributed to the implementation of many plan programs such as the watershed planning process in several counties, boaters' education, wetlands protection, oil spills, household hazardous waste, monitoring, and the new education program outlined in the 1989 plan.

As intended, the PIE-Fund projects have developed effective models for public involvement and education which can now be called on for support in a long-range program. These models have been created based on the educational guidelines which were developed for the long-range education strategy. The models provide significant information about potentially effective educational strategies and about the educational guidelines:

- Utilize existing networks such as trade associations to educate the private sector (peer education). Government may provide much of the information, but the program should be designed and delivered by the audience.
- Tailor the message or program to the audience.
- Build a sense of place by educating individuals about their local resources and problems rather than about generic issues.
- Promote cooperation among groups and institutions. This guideline has prompted very effective education at relatively low cost in many PIE-Fund projects.
- Provide in-depth training to citizens through courses such as the Citizen Action Training School and Bay Watchers. The citizens graduating from these courses have committed to projects that have made a difference in their communities.
- Educate through art, using such programs as Wild Olympic Salmon (where artists provided wildlife trading cards and a giant walk-in salmon) and Meeting Ground (which tells stories to create a sense of place).
- Provide hands-on education for both children and adults.

The Authority also prepared a list of materials about Puget Sound which are available from federal and state agencies and local governments along with a water quality directory for Puget Sound issues. Ecology designated a public involvement coordinator and is preparing a brochure explaining its mailing lists. Through the PIE-Fund, the Authority has also funded teacher training. The Authority has minimal staff support for its library, and as a result there is very limited public access to these materials. Without receiving additional funding, Ecology designated an education coordinator.

The major new development in the Education and Public Involvement Program for the 1989 plan was the long-range education strategy. To advise the Authority in developing the strategy, the Education and Public Involvement Advisory Group (EPIG) was established. This 12-member group was composed of educators, media experts, and representatives of environmental and public interest groups, industry, business, agriculture, state and federal agencies, and local and tribal governments. In turn, to assist the advisory group, work teams were set up to assess the existing and potential roles of various institutions and types of activities. Each work team produced a report based on the consensus of its members. The reports included: (1) Formal Education—K-12 and Post-Secondary; (2) Media; (3) User Groups (or private sector groups); (4) Action Programs (e.g., Adopt-a-Stream, oil recycling, etc.); (5) State Agencies and Interpretive Centers; (6) Nonformal Education (the many agency, local government, and private sector activities happening outside the formal education system); and (7) Public Involvement.

The strategy did not receive funding from the final 1989-91 plan budget. However, certain aspects of the strategy have been pursued by other agencies, local governments, and the private sector, reflecting an increased understanding of the role of education in resource management. Examples of these activities include:

- Ecology has adopted an education policy which reflects the contents and criteria of the long-range education strategy; established an agency education team; increased their information office from four to 24 employees; and reinforced their waste reduction program which is organized around target audiences.
- The State Board of Education unanimously adopted a resolution calling for integration of environmental education into the K-12 curriculum.
- As part of the implementation of the Environment 2010 report, the Governor issued an Executive Order forming a Governor's Council on Environmental Education made up of the directors of the State Departments of Ecology, Fisheries, Ecology, Agriculture, Health, Energy, the Puget Sound Water Quality Authority, and the Interagency Committee on Outdoor Education.
- The Thurston County Office of Water Quality and Mason County Cooperative Extension sought and obtained funds for field agents.
- The Senate passed a bill to provide four field agents to operate jointly under the Washington Sea Grant Program and WSU Cooperative Extension in Mason, Kitsap, and Jefferson counties.
- Cooperative Extension has reallocated resources in order to establish a Puget Sound coordinator and a Puget Sound water quality newsletter, to train staff on water quality issues, and to cosponsor and organize numerous conferences for the public. Staff are currently promoting courses modeled after Bay Watchers in several counties.
- Conservation districts have hired educational staff, created videos and demonstration farms, and cosponsored PIE-Fund projects.
- Puget Sound Bank has created an innovative Puget Sound Fund providing support to a myriad of Puget Sound education activities and projects.

- State Parks has a significant boater education program, DNR has a significant marine plastics debris education program, and Fisheries and Wildlife have expanded their aquatic education programs.

All of these activities, combined with the awareness and education brought about by the activities of 14 watershed planning committees and PIE-Fund projects, have reinforced the direction and goals of the long-range strategy developed for the 1989 plan. Based on this experience, the Education and Public Involvement Program has been modified only slightly.

PROGRAM GOAL

To support, improve, and sustain education and public involvement programs in the region over the long term in order to: (1) inform, educate, and involve individuals, groups, businesses, industry, and government in the cleanup and protection of Puget Sound; (2) increase understanding of the Sound's ecosystem; and (3) create the kind of commitment that will be necessary to sustain efforts to improve and protect water quality over the long term.

STRATEGY

The strategies for achieving this goal include: (1) a public involvement policy to be followed by agencies and local governments; (2) increased resources to state agencies and tribal governments for coordinated interagency/intergovernmental education programs on marine and freshwater habitats, on water quality policy issues, and on volunteer action; (3) field agents to coordinate among local and regional education and public involvement programs; (4) a Public Involvement and Education Fund (PIE-Fund) to support short-term public involvement and education efforts of both the private and public sectors; and (5) a Puget Sound Foundation to support long-term education and public involvement efforts of both the private and public sectors.

PROGRAM ELEMENTS

PI-1. Public Involvement

1.1. Public Involvement Policy

The public involvement policies established in this element shall be followed by all state agencies and local and tribal governments in implementing the Puget Sound plan. The Authority shall monitor public involvement activities of agencies implementing the plan.

The policies are:

- a. A broad representation of the public, both those being directly affected and members of the general public, shall be consulted in developing and adopting rules, establishing criteria, setting guidelines, selecting sites or target areas, developing action plans, and carrying out other activities related to the Puget Sound plan.
- b. A variety of public involvement techniques shall be used. Where advisory or review committees are deemed helpful to provide public involvement in the implementation of the plan, existing standing committees or commissions and es-

established processes such as SEPA, the Shoreline Management Act, and local comprehensive plan procedures should be evaluated and improved where possible rather than creating new committees. However, new or additional committees or processes should be created if needed to achieve full public involvement. Agencies shall consider reimbursing travel expenses of members of advisory bodies.

c. Agencies shall allocate adequate staff resources to their public involvement programs. Agency staff responsible for public involvement shall receive training in public involvement techniques and skills.

d. State and federal agencies, and local and tribal governments shall use public information techniques that exceed requirements for legal notice or publication in the Federal or State Register to ensure that: (1) public information on decisions to be made or actions to be taken for the Puget Sound plan is complete and understandable; (2) the effects, especially effects on special groups or geographic areas, of the proposed decision or action are fully described; (3) the ways in which the public might be affected by the decision or action are fully presented; and (4) the ways in which the public may influence the decision maker and appeal the decision are explained.

e. To facilitate access to decision-making processes, state agencies and local and tribal governments shall send notification for public hearings or meetings as early as possible, shall seek to provide both day and evening meetings and hearings, and shall explain how public comment was incorporated into decisions and actions. For decisions affecting a large geographic area, meetings and hearings shall be held at locations throughout the area.

f. To facilitate understanding of decision making and plan programs, the Authority and other agencies will communicate clearly and simply using lay language whenever possible.

g. Intergovernmental relations with tribal governments: To involve tribal governments in the decision-making process, agencies shall follow the Centennial Accord. Local governments shall communicate with tribal governments to determine the most effective mechanism for inter-government communication with tribes on any programs or projects related to the Puget Sound Water Quality Management Plan. Tribal governments shall follow the Centennial Accord.

Target Dates: Ongoing.

[Status: Agencies and local governments have expanded their public involvement processes and have improved notice of public involvement opportunities. The watershed management committees established under the nonpoint program are receiving education and training. More agency staff are receiving training in public involvement than in the last biennium. Staff resources for public involvement have increased at both the county and state level. There are now widely used standardized systems and techniques in state and local agencies for explaining how public comment was incorporated into decisions and actions.]

1.2. Technical Assistance on Public Involvement

The Authority, Ecology, Cooperative Extension, and the Department of Community Development shall provide technical assistance on public involvement for local governments to assist them in implementing the Puget Sound plan. Technical assistance shall include developing materials, providing training, and

making recommendations. Training shall include the topics of consensus-building, conflict management, and how to utilize volunteers.

These agencies shall support citizen groups by opening agency public involvement training sessions to citizens whenever possible; by notifying citizens of the opportunities to receive training in public involvement related to federal, state, and local permit processes through the Permit Training Team described in EPI-2.3; and by conducting training on how to organize and maintain effective volunteer groups.

Target Date: The Authority's technical assistance and monitoring is ongoing. The Authority, Cooperative Extension, the Department of Community Development, and Ecology shall be organized to provide coordinated technical assistance beginning September 1, 1991.

[Status: Due to a lack of funding for additional staff, the Authority has provided minimal technical assistance on public involvement to state agencies and local government, other than assistance offered to the watershed planning process. The Authority has been monitoring public involvement activities of agencies implementing the plan through biennial reports, a survey of local nonpoint programs, and through discussions held by outreach staff with agency staff and citizens. Technical assistance from the other agencies is a new component of this element.]

1.3. Ecology Coordinator and Mailing List Brochure

Ecology shall maintain a public involvement coordinator who shall be responsible for coordinating public involvement activities related to Ecology's responsibilities under the Puget Sound plan. Ecology shall periodically update the brochure describing the various mailing lists maintained within the department, defining the purpose of each, and giving instructions on how to get on each list.

[Status: Completed and ongoing. Ecology designated a public involvement coordinator in January 1, 1988. Ecology prepared a mailing list brochure by April 1, 1988.]

1.4. Information on Water Quality Issues

List of agency materials. [This portion of element completed.]

[Status: The Authority has encouraged federal and state agencies and local governments to make available to educators and the public reports, brochures, pamphlets, and other up-to-date information related to water quality and the economic and ecological values of Puget Sound. The Authority identified relevant agencies and types of information and prepared a preliminary list of materials available and their locations.]

Water quality directory and information hotlines. The Authority shall update and widely distribute the water quality directory for public use which describes the appropriate contacts for obtaining the information on specific issues related to the Puget Sound plan. The Authority shall circulate a draft of the directory for review among agencies and citizen groups to ensure that it is accurate. The Authority shall coordinate with other agencies to make use of existing information hotlines related to the protection of Puget Sound.

Target Date: June of every year, or as needed.

[Status: Completed and ongoing. By January 1989 the Authority had prepared a directory. The directory was updated in June 1989. The Authority has also coor-

minated with other agencies to make use of existing hot lines to handle inquiries on a wide range of environmental issues related to Puget Sound.]

Puget Sound Research and Monitoring Programs and State of the Sound. The Authority shall make the information from the State of the Sound Report and the Research and Monitoring Programs accessible to the public through libraries, summaries, visual displays, videos, clearinghouses, seminars, and conferences. This function may be assumed by the Puget Sound Foundation.

[Status: Funds for these activities were not available during the 1989-91 biennium.]

Clearinghouse. The Authority and the Puget Sound Foundation shall contribute appropriate information to any environmental clearinghouses established in the state, such as those suggested in the Environment 2010 recommendations.

[Status: An environmental clearinghouse for both eastern and western Washington is being proposed through the Environment 2010 process.]

1.5. Short Course on Local Planning

The Department of Community Development shall develop and conduct an expanded Short Course on Local Planning which includes a component on Puget Sound water quality protection and on public involvement. The department shall widely advertise the availability of the course.

Target Date: No target date established.

[Status: This was a new program which received no funding during the 1989-91 biennium. The course is being developed through a PIE-Fund contract with the Planning Association of Washington, and will be available in spring 1991.]

EDUCATION

EPI-1. Education Guidelines

The following guidelines shall be used in developing programs as part of the long-range strategy for education and public involvement:

- a. Support activities which develop an ethic which promotes protecting Puget Sound as a treasure.
- b. Move beyond the "us versus them" attitude and emphasize water quality as being in everyone's self-interest.
- c. Develop mechanisms for cooperation among the public sector, private sector, and educational institutions.
- d. Focus on local issues and resources and how they relate to the larger picture, promoting a sense of place.
- e. Emphasize interesting, innovative activities which involve people, put them in charge of decisions, and lead to local action.
- f. Provide people with solutions, with things they can do.
- g. Include concrete goals toward which everyone can work and which will visibly demonstrate progress and success.

- h. Include connection with an ongoing information base which provides accurate information on Puget Sound issues. Build on existing programs.
- i. Improve coordination of and cooperation among the education and public involvement resources and activities of state and local governments.
- j. Design and organize activities, training, and information which are tailored to the target audience.
- k. Include youth.
- l. Concentrate resources at the local level but include a Soundwide entity or process which will provide common direction, standards, and coordination for local actions.
- m. Include an ongoing public awareness theme campaign which will support and connect education and public involvement activities.
- n. Conduct educational activities in a variety of settings, both regulatory and non-regulatory.
- o. Have clear goals and objectives and a built-in means of evaluating and modifying the strategy.
- p. Include scientific review of materials and information when appropriate.

Target Date: Ongoing.

[Status: These guidelines have been used to award PIE-Fund contracts. The Authority has advocated use of these guidelines in activities of other state agencies and local governments which are related to education on Puget Sound.]

EPI-2. Coordination Mechanisms

2.1. Local Coordination: Field Agents

The Washington Sea Grant Program, the Washington State University Cooperative Extension Service, and the Authority shall together provide field agents to help coordinate and implement education and public involvement efforts related to water quality and the Puget Sound plan, with an emphasis on working with local governments. The locations and responsibilities of the agents shall be publicized through agency and local government publications and hotlines.

Specific responsibilities of the field agents shall include:

- a. *Assistance to Local Governments.* Providing or arranging technical and staff support to help local governments develop and implement education and public involvement activities or programs which are directly related to implementation of the Puget Sound plan. In the counties where field agents are working, each county will work with the field agents to develop a list of the education and public involvement priorities for that county, based on consultation with other local governments and interested groups in the county. Field agents will use these priorities as a basis for design of their work plan.

- b. *Education and Training.* Providing or arranging for technical assistance and training for local education and public involvement programs and for volunteer groups. Coordinating local use of the training teams described below (EPI-1.3).
- c. *Public Involvement.* Facilitating public involvement in local, state, and national water quality issues: assisting local governments in notifying citizens of impending decision-making processes and opportunities, and providing or arranging for public involvement training at the local level through the technical resources provided in PI-1.2.
- d. *Funding.* Facilitating funding of local education and public involvement programs by identifying sources of funds, including informing groups about the PIE-Fund (EPI-8.1) and the Foundation (EPI-8.2).
- e. *Coordination.* Coordinating local programs with regionwide or statewide programs and with programs in the Puget Sound plan; participating in the evaluation meetings (EPI-2.6).
- f. *Watershed Committees.* Publicizing the work of local watershed committees to local residents and providing information to those committees upon request.
- g. *Evaluation.* Assisting in evaluation of the success, effectiveness, and direction of education and public involvement programs related to the Puget Sound plan and the education strategy. Agents would help local programs to develop evaluation techniques and would work with the Authority and the oversight group to the PIE-Fund (EPI-8.1) to develop overall evaluation techniques for the PIE-Fund and the long-range education strategy (EPI-2.6).

For the 1991-93 biennium Sea Grant and Cooperative Extension will designate field agents to begin a model program in which agents carry out the above responsibilities. Additional field agents shall be added over the next two biennia.

A management group consisting of representatives from Sea Grant, Cooperative Extension, and the Authority shall oversee the program.

The management group will involve local governments in the process of hiring and evaluating the field agents and in determining where the agents will be located. The management group will decide the location of the field agents based upon the following criteria: (a) interest shown in participating in the program as indicated in writing by local governments, groups such as the Hood Canal Coordinating Council, or other interest groups; (b) the need to test the field agent model in different geographic areas and in both urban and rural settings; and (c) the need to test the field agent model as both a regional and a local approach to developing programs.

Field agents shall coordinate their work with tribal field agents described below (EPI-2.2).

Target Date: When funding becomes available, the management group shall request letters of interest from local governments and private sector groups which would like a field agent in a particular region. Sea Grant and Cooperative Extension shall hire field agents when funding becomes available. By 1996 there shall be 18 field agents in the region.

[Status: This element was not funded during the 1989-91 biennium. The Authority contributed some funds to assist Mason, Jefferson, and Kitsap counties in hiring a

shared field agent. In 1990 the legislature passed a bill, SSB 6326, to fund four field agents, two with Sea Grant and two with Cooperative Extension, to work in Mason, Jefferson, and Kitsap counties. Thurston County hired a field agent. This group will provide the first model for this program, provided funding is extended beyond one year.]

2.2. Tribal Government Coordination: Field Agents

The Authority shall provide funds for tribal governments to establish field agents who will assist tribes in conducting education and public involvement programs related to implementation of the Puget Sound plan and in coordinating with other education and public involvement programs. Specific responsibilities of the tribal field agents shall include those listed for Puget Sound field agents (EPI-2.2) above: facilitating tribal involvement, facilitating funding for tribal governments, providing technical assistance and training, coordination of tribal programs with regionwide or statewide programs, working with watershed management committees, and evaluating programs. Tribal field agents under this program shall meet regularly with Puget Sound field agents.

The Authority, Sea Grant, Cooperative Extension, and tribal governments shall meet to determine the guidelines for (a) tribal applications to receive funds under this program, including provisions to ensure participation in the program by small tribes; and (b) coordination among tribal governments, Sea Grant and Cooperative Extension to implement and operate this program. The program shall be operated in conjunction with EPI-2.1 in order to meet the needs of specific tribal and local governments while accommodating some regionwide goals and activities. Implementation of the program shall be contingent upon Sea Grant and Cooperative Extension receiving funds to coordinate the local field agents with the tribal field agents.

Target Date: The equivalent of six full-time tribal field agents shall be hired by December 30, 1991.

[Status: This is a new element.]

2.3. Coordinated Training: Training Teams

State agencies shall support and utilize citizen volunteer efforts by creating inter-agency training teams for volunteer groups on a variety of issues: salmon and stream enhancement, shellfish and shoreline protection, wetlands protection, water quality monitoring, pest management, and wildlife enhancement and protection. The Department of Community Development shall provide training and technical assistance on how to establish and maintain successful volunteer groups (PI-1.2).

Use of these teams shall be coordinated by local field agents who will respond to the requests of citizen groups and local governments to provide training (e.g., for a conference, an adopt-a-beach or protect-a-wetland project, or a citizens' committee on local wetland issues, as well as the nonpoint technical assistance team (NP-6) and watershed management committees (NP-3).)

Each team shall be knowledgeable about:

- a. All regulatory, scientific, policy, and technical issues related to the management and protection of the particular water quality topic or Puget Sound resource assigned to it;
- b. The controversies concerning management of that resource;

- c. What is and is not known about both problems and solutions related to managing or protecting the resource.

Each team shall identify federal, local, and tribal government, private sector, and academic expertise and perspectives and include representatives of these perspectives in training sessions if possible.

For the 1991-93 biennium, the teams should include:

1. *Salmonid Enhancement and Habitat Team.* The Department of Fisheries shall establish an interagency team, including tribal representatives and inviting volunteer sports fishermen, to respond to requests for training by community and school groups wishing to undertake salmon enhancement and stream restoration. The team shall provide information on local fish runs, salmonid habitat, and local watersheds to local government, community, school, and private sector education and public involvement programs. The team should support and coordinate with the needs of the Recreational Enhancement Plan, Regional Enhancement Plan, and Salmon 2000 programs of the Department of Fisheries.

2. *Monitoring Team.* The Department of Ecology shall establish an interagency team to provide technical assistance and training for community, school, and local government water quality monitoring programs. The team shall be able to provide information about low-cost monitoring technologies and about the Michigan-based international water quality monitoring program for students.

3. *Wetlands Team.* The Department of Ecology shall establish an interagency team to provide training to volunteer groups wishing to protect or enhance wetlands. This team shall be an integral part of the wetlands education program (W-7).

4. *Shellfish and Shoreline Habitat Team.* The Department of Fisheries shall establish an interagency team to train volunteers interested in shellfish and adopt-a-beach issues such as marine plastic debris and shoreline access or protection. This team shall provide assistance to implement the Low Tide Event (SF-7) and the Boater Education program (MB-4).

5. *Pest Management Team.* Cooperative Extension shall establish an interagency pest management team to provide information on integrated pest management, marine pesticide issues from marine applications, pest-resistant and native plant species for streamside revegetation, and habitat enhancement. The team will operate as an integral part of the Puget Sound Pest Management Information Center (NP-17).

6. *Wildlife Team.* The Department of Wildlife shall establish a wildlife team to train volunteers on wildlife habitat and wildlife protection, habitat enhancement, and bird rescue from spills. This team will operate as part of the Wildlife Habitat Protection team for business and industry (EPI-3.3).

7. *Permit Training Team.* The Department of Community Development shall establish a permit training team to train citizens in public involvement related to water quality permits (for example, NPDES permits, shoreline permits, hydraulic permit applications, Section 404 permits). The NPDES portion of this activity will be closely coordinated with Ecology's public outreach on NPDES permits, element P-26.

Target Date: The teams shall be organized and ready to provide training by September 30, 1991.



[Status: These teams were not funded for the 1989-91 biennium.]

2.4. State Coordination: Environmental Education Task Force

The Environmental Education Task Force should include representatives of the Conservation Commission or conservation districts, Washington Sea Grant, Washington State University Cooperative Extension, and local and tribal governments.

The Environmental Education Task Force shall:

- Provide a forum for communication and coordination among general education and information programs of agencies;
- Provide the link between the general education and public involvement programs of agencies and the overall management and direction of the Puget Sound long-range education and public involvement strategy;
- Provide a forum in which to decide which agency should be the lead on cooperative interpretive efforts (as in EPI-3.1 under General Audiences below), new interagency training teams (EPI 2.3 above), or other cooperative educational programs;
- Where appropriate, act as the planning committee for cooperative or coordinated projects;
- Publish the educational planning schedules of agencies;
- Annually publish a list of the individuals and phone numbers in each resource agency who have formal responsibilities for education and public involvement; and
- Continue to coordinate agency support to K-12 teacher training and program implementation by working with the Superintendent of Public Instruction (EPI-6.1) and the local field agents.

Target Date: The Task Force shall begin to perform the functions described when funding is received.

[Status: This element was not funded for the 1989-91 biennium. The Environmental Education Task Force has operated without separate funding to provide a forum for coordination among agency programs, including plan programs such as boaters education (MB-4), watershed planning (NP-4), and teacher training (EPI-6.1). The Task Force has expanded its membership as requested in the 1989 plan. The State Board of Education has adopted a resolution to integrate environmental education into the K-12 curriculum. The Governor has issued an Executive Order forming a Governor's Council on Environmental Education made up of the directors of the natural resource agencies.]

2.5. Agency Coordination: Education Coordinators

Ecology, Fisheries, Wildlife, DNR, Parks, Cooperative Extension, and Sea Grant will hire education coordinators who will coordinate education programs related to Puget Sound within each agency and among agencies. The coordinator will ensure that agency education programs related to Puget Sound are consistent with the direction of the statewide program of each agency. Specific responsibilities of the coordinator include coordinating the agency's education resources with those of other agencies to develop the train-

ing teams for volunteer audiences, the waste reduction and habitat protection programs for business and industry audiences, the cooperative interpretive programs for general audiences, programs for the schools, agency participation in the Environmental Education Task Force (EPI-2.4), and agency participation in the Puget Sound Plan Coordination and Evaluation Meetings (EPI-2.7 described below).

Target Date: Ecology shall hire the coordinator by July 31, 1989. Other agencies shall hire coordinators by September 30, 1991.

[Status: This element was not funded for the 1989-91 biennium. Ecology hired an education coordinator in September 1989, who has been coordinating Ecology's internal education programs, as well as Ecology's role in the Environmental Education Task Force and in some plan programs.]

2.6. School Coordination: Office of Environmental Education

The Office of Environmental Education of the Superintendent of Public Instruction shall hire professional staff¹ to support and improve K-12 environmental education in the Puget Sound region. Specifically, the office shall: (1) coordinate and implement the teacher training and monitoring assessment programs described in EPI-6, Youth Audiences, below; (2) staff the interagency Environmental Education Task Force; (3) facilitate access to Puget Sound information resources for schools and teachers, including learning facilities such as those available at state parks; (4) work with local field agents to facilitate school and student participation in other programs related to the Puget Sound plan—watershed planning, adopt-a-beach programs, household hazardous waste collection days, interpretive center displays, Coastweeks, etc.; (5) publish annual educational schedules and activities of regionwide interpretive centers (EPI-3.4); and (6) promote field trips to Puget Sound marine habitats.

Target Date: SPI shall hire staff by October 30, 1991.

[Status: This element was not funded for the 1989-91 biennium. The Office of Environmental Education has chaired the Environmental Education Task Force.]

2.7. Puget Sound Plan Coordination and Evaluation: Meetings

The Authority shall call two meetings a year in which educators and program staff will advise the Authority on the effective strategies for education and public involvement programs related to the Puget Sound plan. The meetings will provide an opportunity for education and public involvement program staff to discuss: (1) program needs which might be met with resources or ideas from other programs; (2) timing and coordination issues; and (3) techniques for evaluating programs. The meetings will be widely advertised to local governments, tribal governments, nonprofit groups, and business and industry.

The meetings shall include the local field agents (EPI-2.1) and appropriate staff from the Authority, Ecology, and other agencies implementing the plan's education and public involvement programs. Ecology representatives shall include: the public involvement coordinator (PI-1.3), the education coordinator (EPI-2.4), hazardous waste information office staff (HHW-2), a member of the non-point technical assistance team (NP-6), wetland education staff (W-7), point source outreach staff (P-26), stormwater education staff (SW-2), waste reduc-

¹ Certified teachers are preferred.

tion staff (EPI-5.1), shellfish education staff (SF-7), contaminated sediments education staff (S-9) and, where appropriate, other members of Ecology's Education Team. The meetings shall also include SPI staff to the Environmental Education Task Force (EPI-2.6), staff for the Boaters Task Force (MB-4), the coordinator for DNR's Marine Plastic Debris Program, and staff from other appropriate educational programs of Fisheries, Health, Wildlife, DNR, and Parks. In addition, representatives of staff from local watershed programs which include education (NP-3 and NP-4), conservation district staff, and education staff for tribes shall be invited. The Authority shall encourage the participation of education and public involvement staff from private sector programs. Summaries of these meetings shall be provided to the Education and Management Councils of the Puget Sound Foundation (F-1), the PIE-Fund, the agency education coordinators (EPI-2.4), and the management group of the Field Agent Program (EPI-2.1).

Target Date: The Authority shall convene the first meeting by November 1991.

[Status: This program was not funded for the 1989-91 biennium, nor were many of the positions designated to participate. Authority staff have met with representatives of some of these programs and some coordination has occurred through Ecology, the Environmental Education Task Force, and the watershed programs. One meeting has been held to discuss possible evaluation methods. WSU is conducting an evaluation of the PIE-Fund which may help develop evaluation techniques.]

PROGRAMS TAILORED TO DIFFERENT AUDIENCES

EPI-3. General Audiences

3.1. State Interpretive Programs

For each topic or issue which would benefit from interpretive programs or projects (as opposed to major interpretive centers), the interagency Environmental Education Task Force (EPI-2.4) shall designate a lead agency to develop a pilot interpretive project. The purpose of the pilot interpretive project shall be to identify the issues, perspectives, controversies, expertise, and educational approaches held across agencies on that topic or issue. After a comprehensive interpretive approach has been identified, agencies may subsequently undertake interpretive projects on their own, utilizing the knowledge gained through the pilot project.

The lead agency shall convene a committee including representatives of private and public sectors and tribal governments. Lead agencies are already designated for those topics listed below:

1. *Watersheds and Fish Habitat.* The Department of Fisheries shall convene a committee to develop a model watershed interpretive program at hatcheries located at sites easily accessible to visitors.
2. *Shellfish.* The Department of Fisheries shall convene a committee to develop an interpretive program at an appropriate location in Puget Sound (see Shellfish element SF-7).

3. *Wetlands.* The Department of Ecology shall convene a committee to develop a wetlands interpretive program. This program shall be integrated with Ecology's wetlands education program under element W-7.

4. *Contaminated Sediments.* Ecology shall convene a committee to develop an interpretive program for contaminated sediments. This effort shall be integrated with the public information/public involvement activities under elements S-4, S-7, and with the education activities under S-9. The resulting materials shall be maintained and made available, independent of those elements, to educators, the media, and the public.

Target Dates: Fisheries shall assemble committee by September 30, 1991. One hatchery display will be completed by June 30, 1992. The shellfish interpretive program shall begin by March 30, 1992. The wetlands interpretive program shall begin August 1991. Development of materials on contaminated sediments shall begin October 1991.

[Status: None of these activities were funded for the 1989-91 biennium.]

3.2. Washington State Ferries

The Department of Transportation shall initiate a program on the Washington State Ferry system which will train volunteers to make presentations on topics directly related to Puget Sound such as the history of the ferry system, the history of ports, marine resources of the Sound, protection of Puget Sound, etc.

The display system implemented by the Washington State Ferries for the Centennial Celebration shall be continued and expanded.

Target Date: No target date established.

[Status: Partial funding is available during this the 1989-91 biennium for this element. The Authority has been meeting with the Washington State Ferries to begin to partially implement this element.]

3.3. Wildlife Habitat Education

The Department of Wildlife shall implement a program to introduce wildlife education at state parks and other recreational settings. The program shall promote understanding of the habitats for marine, freshwater, and upland wildlife by adapting existing hands-on activities from existing programs, many of them from K-12 curriculum such as Project Wild of the Wildlife Department, FOR-SEA of the Poulsbo Marine Science Center, and programs from the Office of Environmental Education. Wildlife shall work with Washington State Parks to provide training to park rangers. Wildlife and State Parks shall provide stipends for facilitators of the various programs such as Project Wild so that teachers may be trained to implement these programs on weekends and in the summer. State Parks shall coordinate the educational activities of the rangers and the facilitators operating at state parks.

Target Dates: The Department of Wildlife shall conduct a program at state parks for the summer of 1992.

[Status: This is a new element.]

3.4. Interpretive Centers

The Authority shall provide funding to existing interpretive centers² around the Sound to support staff development and training, workshops, displays, and interpretive activities on Puget Sound. The Authority shall provide interpretive centers with information such as the State of the Sound Report and *Puget Sound: Our Heritage At Risk*, from which interpretive centers can design displays or programs. The Authority and the Office of Environmental Education will publicize the schedules and activities of interpretive centers on a regionwide basis. The Puget Sound Foundation shall assume these responsibilities as funding becomes available.

Using a geographic information system (GIS), the Puget Sound Foundation (F-1) may create three-dimensional representations of Puget Sound embayments or marine water bodies on which they portray the local information from the Puget Sound Ambient Monitoring Program (PSAMP) and the past and/or current research efforts occurring in that location. These representations shall be distributed to a local interpretive center for its use, in order to educate citizens about PSAMP and the Research Program.

Target Dates: The Authority shall disseminate materials to interpretive centers by June 30, 1991. One cross-training session for staff from the various centers will be offered by February 1992. Funding for displays or other activities will be released by December 30, 1992.

[Status: This element was not funded during the 1989-91 biennium.]

3.5. New Interpretive Centers

The Puget Sound Foundation may initiate a process to establish new interpretive centers which would fill both geographical and topical gaps in interpretive activities related to the Sound.

Target Date: The Foundation shall begin the process no later than two years after it is established.

[Status: This element was not funded during the 1989-91 biennium.]

EPI-4. Volunteer Audiences

State agencies and local governments shall support and utilize the interest and expertise of volunteers who wish to protect or enhance Puget Sound water quality and habitats, and who wish to educate their communities on related issues. Toward this purpose, state and local agencies shall fund and utilize the

² Snake Lake Nature Center (City of Tacoma), Bellingham Maritime Heritage Center (nonprofit), Padilla Bay (Department of Ecology), Nisqually Delta (U.S. Fish and Wildlife Service), Nisqually Reach Nature Center (nonprofit), Poulsbo Marine Science Center (nonprofit), Fort Worden Marine Science Center (nonprofit), Feiro Marine Lab (Port Angeles), Seattle Aquarium (City of Seattle), Point Defiance Aquarium (City of Tacoma), Friday Harbor Whale Museum (nonprofit), Jetty Island (City of Everett), Blaine Marine Resource Center (being developed; Blaine).

field agents and training teams described in EPI-2.1 and 2.3 above; and shall notify volunteers of funding opportunities through programs such as PIE-Fund.

Using the volunteer training teams (EPI-2.3) and expertise from the universities and their own faculty, Sea Grant and Cooperative Extension shall create an advanced program for Master Stewards for watersheds for Puget Sound in which volunteers are certified. These volunteers will then be available to provide technical assistance to government and private sector programs. Sea Grant and Cooperative Extension shall meet with representatives of state agencies and local and tribal governments to design the criteria for certification.

Target Date: Sea Grant and Cooperative Extension shall offer a program for Master Stewards by June 1992.

[Status: The training teams and field agents were not funded during the 1989-91 biennium.]

EPI-5. Business and Industry Audience

5.1. Pollution Prevention

Ecology shall expand its waste reduction program where possible to coordinate with the waste reduction or pollution issues of the Departments of Health, Agriculture, Fisheries, Wildlife, and DNR, in order to provide audiences in business and industry with comprehensive messages on the actions necessary to prevent pollution generated by the particular activities of each audience. This program would integrate information for each audience on issues such as municipal sewage treatment systems, pretreatment programs, discharge permits, stormwater systems, septic systems, solid waste landfills, hazardous waste disposal, waste reduction, and plastic marine debris. Where appropriate, referrals should be made to related local government programs such as those of Metro.

Cooperative Extension shall coordinate the educational resources of conservation districts and the Departments of Agriculture, Ecology, Fisheries, Wildlife, and Health to provide target agricultural audiences and pesticide applicators with a comprehensive message on the actions necessary to prevent their wastes from entering the water.

Sea Grant shall coordinate the educational resources of the Departments of Ecology, Fisheries, and Natural Resources and the Coast Guard in order to organize a similar program to deliver coordinated messages to commercial fishing, aquaculture, and marine transport industry audiences.

The lead agencies designated above shall work with the Business Assistance Office of the Department of Trade and Economic Development, local field agents, and members of the target audience to develop the information and materials and to determine the best mechanisms to deliver the message (e.g., trade fairs, bulletins, trade association seminars or conferences, in-house training, community college classes, videos, agency programs, etc.). The lead agency, in consultation with members of the target audience, shall determine who should deliver the program (the state, the private sector, local field agents, local governments such as Metro, or educators).

Target Dates: Ecology shall hire a coordinator for this program by October 30, 1991. Other state agencies shall assign their liaisons to Ecology, Cooperative Extension, and Sea Grant by October 30, 1991.

[Status: This program is partially funded through Ecology's waste reduction program which has expanded significantly since this element was written into the 1989 plan. In cooperation with WSU Cooperative Extension Services, Ecology has an active education program for pesticide users. However, Ecology does not currently have the resources to coordinate with all other related programs within Ecology or with other state agencies to provide a comprehensive introduction to waste issues to each target audience.]

5.2. Habitat Protection

The Department of Wildlife shall coordinate with the educational resources of the Departments of Fisheries, Ecology, and Natural Resources to provide education on habitat protection and enhancement to developers, realtors, contractors, and business and industry. This program shall include the implementation of joint habitat enhancement and education programs as described in the Habitat Program (H-4.2 and H-4.3).

Target Date: The Department of Wildlife shall initiate a program by January 1992.

[Status: This is a new element.]

5.3. Water Quality Protection Through Peer Education

The Authority shall continue to encourage business and industry to use the PIE-Fund (EPI-8.1) in order to implement water quality education projects by peer education through their networks and associations.

EPI-6. Youth Audiences

6.1. Teacher Training

The Office of Environmental Education of the Superintendent of Public Instruction shall coordinate and fund a Soundwide program to train elementary, middle school, junior high, and high school teachers in environmental education. School districts shall be provided with funds for teacher-release time to attend workshops to learn to use existing curricula related to Puget Sound and water quality. Matching funds shall be made available to existing programs for workshop facilitation and materials. Teacher release time may be used for training or for teachers to modify existing curriculum to the local situation, including the incorporation of information on local habitats or issues.

Target Dates: SPI shall begin to advertise and organize workshops and training programs as soon as funding is provided. Approximately 500 teachers shall be trained by May 1992.

[Status: This element was partially funded through the PIE-Fund for both the 1987-89 and 1989-91 biennia. As of December 1990, 52 workshops have been offered, attended by about 1209 teachers. SPI was not funded for this element and had to integrate the coordination and implementation of this element into its existing workload. Teacher training is one of the education recommendations of Environment 2010.]

6.2. School and Citizens' Monitoring Programs

The Office of Environmental Education shall provide water quality kits to schools to undertake pilot freshwater monitoring projects related to agency and citizen programs or to participate in the Michigan-based international water quality monitoring program. When these programs have been operating for a year, the Office of Environmental Education shall consult with the Authority, Ecology, the Monitoring Management Committee, the Monitoring Training Team (EPI-2.3), community college faculty, elementary and high school teachers, and citizens to provide recommendations to the Authority on: (1) the feasibility of expanded citizens' and school monitoring programs; (2) the parameters for which citizens and students can best provide information for PSAMP and freshwater programs; (3) appropriate laboratory support and training for such a program; (4) data access and feedback mechanisms for effective citizen and school participation in monitoring programs; and (5) the practicality of integrating monitoring into existing school curricula. The Office shall coordinate this program with the Monitoring Training Team, (EPI-2.3). (See element M-3 for more information on citizens' monitoring.)

Target Date: The Office shall submit a report to the Authority by August 1992.

[Status: This element was not funded during the 189-91 biennium. However, an increasing number of teachers are involved in the Michigan-based water quality monitoring program through which students in Washington can share their data with students in the United States, Germany, and New Zealand. Grade school and high school students are involved in the activity. Access to the Michigan computer is free.]

EPI-7. College and University Student Audiences

7.1. Puget Sound Internships and Credit

The Authority shall work with Ecology, other agencies, and the Puget Sound Foundation to establish internships and opportunities for students to prepare case studies on issues related to Puget Sound.

When possible, the Foundation will structure its conferences so that appropriate credit can be provided for college students and school teachers (F-2).

Target Date: Possible internships will be identified by November 1991.

[Status: This element was not funded.]

7.2. Post-Secondary Monitoring

Agencies and local governments involved in water quality monitoring through ambient monitoring, watershed, or stormwater programs shall seek opportunities to involve universities and community colleges in monitoring projects through classes or internships or by utilizing community college laboratories.

Target Date: Possible internships will be identified by November 1992.

[Status: This is a new element.]

EPI-8. Funding

8.1. PIE-Fund

The Authority shall continue to support the funding of local programs through the Public Involvement and Education Fund (PIE-Fund). The Authority shall publish requests for proposals for local programs which:

- a. Raise awareness of water quality issues by engaging people in actions to protect Puget Sound. These action projects could include such activities or projects as adopt-a-beach, adopt-a-stream, protect-a-wetland, household hazardous waste collection days, water quality monitoring, and biological surveys. To be effective, these programs often require funds for signs, equipment, and brochures and may require technical expertise and training.
- b. Raise awareness of water quality issues through general and diverse education activities. These communications programs could include such activities as workshops, conferences, plays, poster projects, tours, festivals, and brochures. To be effective, these programs often require funds for printed and audio-visual materials or staff and may require technical expertise and training.

Groups will apply for these funds through a request-for-proposals process which would include the criteria in EPI-1. Funds will be awarded by contracts. Groups eligible for funding will include business and trade associations with special emphasis on peer education, local and tribal governments, conservation districts, community and environmental organizations, schools and school districts, community colleges, and universities. Projects eligible will include existing and new programs as well as proposed activities related to any topic addressed in the plan and any area of Puget Sound. The Authority shall issue guidelines, call for proposals, select participants, and administer contracts. The Authority shall invite other agencies to specify programs or categories for which to solicit proposals.

The proposals will be reviewed by an Education and Public Involvement Advisory Group (EPIG) which will make final recommendations on funding to the executive director of the Authority. EPIG will be a 10- to 12-member group which includes educators, media experts, representatives of environmental and public interest groups, industry, business, agriculture, and local and tribal governments. At least half of the membership will come from the private sector, business and industry, environmental nonprofit, etc.

A portion of the PIE-Fund should be directed toward programs that specifically support the educational needs of local governments which are directly related to the Puget Sound plan, particularly those governments that are not receiving direct support from the field agent program (EPI-2.1). Contracts may also be awarded through competitive processes for conferences, evaluations, publications, and projects which relate directly to the purpose of the PIE-Fund.

Target Date: The first round of contracts shall be awarded by December 31, 1991.

[Status: The PIE-Fund is completing its second biennium. As of June 1990, 101 projects have been funded totaling about \$2 million. A two-day conference was held in Seattle in April 1989, where the first 47 PIE-Fund projects shared their experience, methods, and materials.]

8.2. Puget Sound Foundation

The Puget Sound Foundation shall work with federal and state agencies, local governments, nonprofit groups and business and industry to seek funding for long-term education and public involvement projects for Puget Sound, as described in the Foundation Program (F-1).

[Status: It is anticipated that the Authority will establish the Puget Sound Foundation as a nonprofit corporation during the 1989-91 biennium.]

EPI-9. Puget Sound Water Quality Authority Activities

The Authority shall continue to use its planning and oversight process as a means to provide leadership in education and public involvement on water quality issues in Puget Sound region. Specifically, the Authority shall conduct the following activities:

Public Outreach. The Authority shall conduct a proactive public outreach program which includes:

- a. Seeking out parties interested in or affected by plan implementation.
- b. Designating staff liaisons for:
 - (i) County and tribal governments (staff and elected officials). Staff liaisons will work to ensure that program staff conduct planning, implementation, and oversight with an awareness of local water quality programs, needs, and issues.
 - (ii) Constituency groups, including business, agriculture, and environmental groups. Staff liaisons will work to ensure that program staff conduct planning, implementation, and oversight with an awareness of the issues which different constituencies face as a program is introduced and implemented, and the role of a constituency in protecting water quality.
- c. Training Authority staff to provide general information on any program in the Puget Sound plan.
- d. Developing concise, readable materials for the general public describing issues, programs, and activities.

Public Education. The Authority shall continue to educate the public through seminars, field trips, conferences, public meetings, publications, media, videos, and distribution of Authority information to local libraries.

Newsletter. The Authority shall use its newsletter, slide shows, and media contacts to publicize opportunities for the public to become involved in policymaking, monitoring, cleanup, or educational activities related to the Sound. The Authority shall also use its newsletter and slide shows to give recognition to new and existing efforts and programs which are supportive of the goals of the plan.

Coordination. The Authority shall coordinate the integration of education and public involvement elements of all programs in the plan in order to avoid duplication of resources (see EPI-2.7).

Schools. The Authority shall work with the Superintendent of Public Instruction and with the Environmental Education Task Force created by the 1986 legislature to coordinate educational programs on water quality for K-12.

Campaigns for Puget Sound. The Authority shall initiate public awareness campaigns or activities which:

- Focus on tangible results toward which individuals in both the private and public sectors can easily direct initiative and resources; and
- Provide an opportunity to show measurable results which present clear and visible feedback on our success in meeting a water quality goal or objective for Puget Sound.

Campaigns could address tangible results towards such goals as: reopen commercial and recreational shellfish beds; reduce plastic debris in Puget Sound; reduce the amount of oil in Puget Sound; reduce septage in Puget Sound; reduce contaminants in stormwater; restore wetlands or shoreline habitat, etc.

Year of the Sound. The Authority and the Puget Sound Foundation shall request that the governor declare 1993 the Year of the Sound and appoint a Year of the Sound Committee which includes representatives of both the public and private sectors. The committee shall seek funding and support for schools, colleges, agencies, and industry to work together to promote and create events which highlight the Sound and what people are doing to protect it, and which provide in-depth educational opportunities on the Sound and its management issues.

Sound Waters Award Program. The Authority shall work with the Foundation to develop an annual Sound Waters Award program which recognizes small or large businesses, trade associations, local governments or local government officials, developers, service clubs, youth groups, individuals, and others for positive action taken to protect water quality.

Target Dates: Activities related to public outreach, public education, coordination, newsletter, and schools are ongoing. By January 1992 the Authority shall initiate a campaign, and request that the Governor declare 1993 the Year of the Sound.

[Status: Through its newsletter, Soundwaves, the Authority has publicized opportunities for the public to become involved in policymaking and has given recognition to new and existing efforts and programs which are supportive of the goals for the plan. The Authority held three major conferences on sediments, education and public involvement, and legislative solutions to water quality problems; and conducted various seminars, field trips, and public meetings on issues in the plan. The Authority's numerous publications were widely distributed to regional libraries and interested parties. Coordination and integration of education elements from all programs has been promoted through staff work with state and local agencies, with nonpoint watershed committees and staff, with the Environmental Education Task Force and Environment 2010, and with Ecology staff developing the department's new education policy. The work with SPI, which has focused on teacher training and curriculum development, will continue.]

The Authority did not receive adequate funding to carry out this element at the level originally intended, and did not receive funds for the campaigns, Year of the Sound, or award program.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

The Authority will consider the adequacy of public involvement when reviewing major public actions identified in other programs. As part of its review of biennial reports of state and local agencies (see Chapter 4), the Authority will consider implementation of the public involvement policy.

**LEGISLATION
REQUIRED**

None.

ESTIMATED COST

A fully funded education program will cost approximately \$5 million for the 1991-93 biennium, increasing to \$8.8 million in the 1995-97 biennium. This includes \$1.1 million each biennium for the PIE-Fund. The major cost in the program is for the field agents and interagency resource teams. This element (EPI-2) expands from \$3.4 million in 1991-1993 to \$5.4 million in 1995-97.

Since many of the ideas from the long-range strategy are incorporated into the educational elements of Environment 2010, these program costs and the education strategy need to be integrated into the design and funding for 2010.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Education and Public Involvement

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
PI-1 Public Involvement	\$226,048	\$181,168	\$148,084	\$500,727	\$535,801
EPI-2 Coordination Mechanisms ²	\$1,420,732	\$29,000	\$3,453,320	\$4,209,983	\$5,302,292
EPI-3 General Audiences	\$0	\$0	\$0	\$418,851	\$389,000
EPI-4 Volunteer Audiences	\$150,000	\$100,000	\$0	\$0	\$0
EPI-5 Business and Industry Audience	\$17,200	\$0	\$330,188	\$854,562	\$1,116,769
EPI-6 Youth Audiences	\$120,400	\$0	\$161,200	\$322,400	\$322,400
EPI-7 College and University Audiences	\$0	\$0	\$10,000	\$30,000	\$40,000
EPI-8 Funding	\$51,000	\$1,100,000	\$1,100,000	\$1,120,000	\$1,120,000
TOTALS	\$1,985,380	\$1,410,168	\$5,202,792	\$7,456,523	\$8,826,262

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$810,000	\$970,000	\$1,110,000
Centennial Clean Water Account	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000
Local Funding Sources	\$407,380	\$0	\$0	\$0	\$0
State General Fund	\$478,000	\$310,168	\$3,292,792	\$5,386,523	\$6,616,262

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$0	\$29,000	\$97,500	\$130,000	\$97,500
Conservation Commission	\$0	\$0	\$65,000	\$65,000	\$130,000
Cooperative Extension	\$0	\$0	\$681,736	\$928,851	\$1,341,373
Department of Community Development	\$0	\$0	\$0	\$176,500	\$241,500
Department of Natural Resources	\$13,750	\$0	\$157,420	\$198,382	\$249,013
Department of Health	\$0	\$0	\$141,945	\$194,223	\$276,387
WA Department of Transportation	\$0	\$0	\$0	\$100,000	\$100,000
Department of Ecology	\$156,300	\$181,168	\$492,289	\$960,431	\$1,020,005
Local Governments	\$407,380	\$0	\$10,000	\$15,000	\$15,000
Parks and Recreation Commission	\$13,750	\$0	\$56,198	\$55,198	\$55,198
Puget Sound Water Quality Authority	\$1,370,700	\$1,200,000	\$1,113,000	\$1,213,610	\$1,243,610
Washington Sea Grant	\$0	\$0	\$825,741	\$1,022,346	\$1,376,235
Superintendent of Public Instruction	\$0	\$0	\$306,200	\$480,400	\$492,400
Department of Trade and Econ. Develop.	\$0	\$0	\$32,500	\$65,000	\$97,500
Tribal Governments	\$0	\$0	\$790,000	\$925,000	\$1,055,000
Department of Fisheries	\$9,750	\$0	\$219,403	\$480,024	\$544,285
Department of Wildlife	\$13,750	\$0	\$213,860	\$446,558	\$491,256
TOTALS	\$1,985,380	\$1,410,168	\$5,202,792	\$7,456,523	\$8,826,262

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Educational outreach and coordination is also funded in Habitat element H-4, and Wetlands element W-7.

PUGET SOUND FOUNDATION PROGRAM

PROGRAM ELEMENT DIRECTORY

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F-2. Puget Sound Foundation Future Functions	131

PROBLEM DEFINITION



In the 1989 Puget Sound Water Quality Management Plan both the Research Program and the Education and Public Involvement Program acknowledged the need for an independent institution to ensure the long-term coordination and funding of research and education activities. Historically, research and education projects in Puget Sound have reflected the various, sometimes narrow, perspectives of the agencies that fund or carry them out. As a result, they have suffered from lack of coordination, have been largely short term in extent, and have rarely focused specifically on Puget Sound and its processes.

Yet the need for long-term, active research and education programs with a Puget Sound perspective is greater than ever. Ongoing research activities, including basic studies designed to enlarge our fundamental understanding of the natural system, and directed or applied studies designed to solve specific management and/or environmental problems, must continue to provide the basic tools for sound planning and management. Educational activities must be sustained to maintain the public's awareness of its partnership with governmental agencies and the private sector in the management effort, both as contributors to the problems in the natural system and as stewards and funders of the commitment to solve them.

With the creation of the Research and Education Programs in the Puget Sound plan, the Authority established a framework for centralizing, coordinating, and funding these functions. This framework, however, suffers from the same limitations of time and resources as those of other agencies. These programs have been plagued by a lack of significant financial support (with the exception of the very successful Public Involvement and Education Model Projects Fund, or PIE-Fund). Acknowledging these limitations, advisory groups to the Research and Education Programs called for the creation of an independent, nonprofit Puget Sound foundation to provide the centralized, long-term support that the successful implementation of sustained research and educational strategies requires.

PROGRAM STATUS

The need for ongoing institutional structures to coordinate program strategies and funding has been addressed by a number of advisory groups, including the Subcommittee on Institutional Issues of the Committee on Research in Puget Sound, the Education and Public Involvement Advisory Group, the Monitoring Management Committee, and the Puget Sound Finance Committee. In 1989 the Combined Committee for a Puget Sound Foundation, which was formed by representatives of these groups, adopted a proposal to create a nonprofit corporation to ensure long-term coordination and funding of research and educational efforts related to Puget Sound.

The foundation proposal was forwarded to the Governor's Advisory Group on the Puget Sound Water Quality Authority and to the Legislative Budget Committee staff for their consideration. Chapter 115, Laws of 1990, the Authority to create a public nonprofit corporation under Chapter 24.03 RCW.

It is anticipated that in the 1989-91 biennium, and concurrent with maintaining the Puget Sound Research and Education Programs, the Authority will establish the Puget Sound Foundation as an independent, public nonprofit corporation.

The organizational structure of the Foundation is designed to:

1. Facilitate and enhance the potential for generating permanent, regionally-controlled funding from private and public sources, including federal and state agencies;
2. Facilitate participation in the activities of the Foundation (especially the setting of research and education priorities) by the scientific community, educators, industry, citizens' groups, local and tribal governments, and state and federal regulatory and resource management agencies;
3. Ensure that experts in a range of disciplines are available to provide independent advice and guidance to the processes of establishing priorities, recommending grant awards, and translating and disseminating program results;
4. Foster interagency coordination and funding of research and education efforts pertinent to Puget Sound;
5. Enhance access to and communication of research results and educational programs for all parties concerned with Puget Sound management; and
6. Provide interdisciplinary review of scientific and educational programs where appropriate.

The internal organization of the Puget Sound Foundation is proposed to consist of:

Board of Directors. The governor appoints a board of directors, which may include representatives from public, private, and tribal sectors. At least one director is a member of the Authority. The duties of the board include:

1. To have full authority and responsibility for management and policy decisions and allocations of the Foundation's resources;
2. To rule on the acceptability of lists of priorities for research and education and of projects to be funded that are presented for approval by the research and education councils. The Board must accept or reject such lists as a whole, and may not veto individual recommendations within a list;
3. To employ an executive director of the Foundation who serves at the pleasure of the directors of the corporation and who hires and manages staff;
4. To seek and receive gifts, grants, and endowments from public or private sources, in trust or otherwise, and to make grants of such funds to research and education projects, in fulfillment of the mission of the Foundation;
5. To work with federal, state, local, and tribal governments and private groups to coordinate research and education activities within Puget Sound; and
6. To produce an annual report on the activities of the Foundation.

Research and Education Councils. Composed of 12 members each, the research and education councils review and make recommendations for high-priority needs and projects to be funded in their fields to the board of directors. The

membership of these councils is chosen initially by the Authority. The research council shall be composed of scientists with knowledge of Puget Sound processes and natural resources and/or with specific experience in relevant disciplines. The education council shall be composed of both professional educators and representatives of private sector use groups.

Management Council. The management council shall consist of representatives from federal and state agencies and local and tribal governments which either manage programs that fund Puget Sound research and education or have responsibility for managing Puget Sound water quality and natural resources. The management council provides coordination and communication between the Foundation and resource managers. Representatives of industry, citizens' groups, and other associations or groups that use the results of research or education programs may be non-voting members of the management council. The primary function of this council is to produce an annual assessment of research and educational needs from the perspective of its membership, and to coordinate the activities of the research and education councils in light of this assessment.

PROGRAM GOAL

To undertake long-term solutions to the problems of coordinating, implementing, and funding research and education activities which enhance the health, responsible use, and diversity of Puget Sound.

STRATEGY

The strategy for achieving this goal is to: (1) fund and coordinate research and education programs on Puget Sound; and (2) assume responsibility for certain elements of the research and education programs as staff and funding allow.

PROGRAM ELEMENTS

F-1. Puget Sound Foundation Functions and Coordination

1.1. Ongoing Functions

The Puget Sound Foundation shall carry out the following functions of the plan's Research and Education Programs to ensure their long-term, continuous implementation:

1. Determine high-priority needs for research and education on Puget Sound (R-1.1, R-3, and EPI-8.2).
2. Seek permanent, regionally-controlled funding from public and private sources for research and education (R-1.2 and EPI-8.2).
3. Review and rank ongoing and new research and education projects according to high-priority and funding needs. Peer reviews of proposals submitted in each high-priority research and education area will be solicited. Proposals will be selected on the basis of established criteria, including, but not limited to:

quality, significance of expected scientific or educational contribution, importance to an affected Puget Sound resource, and cost (R-1 and EPI-8.2).

4. Administer a research and education grants program to fund projects addressing high-priority research and education needs that are not already funded by governmental agencies or industry. The program will work cooperatively with agencies to allocate funds, including supporting basic or process-oriented research that may not be within a particular agency's mission but that is required to understand and apply the results of applied research (R-1.3 and EPI-8.2).

1.2. Coordination with Other Programs

The Puget Sound Foundation shall coordinate its activities with those of other agencies and institutions and with continuing programs of the Puget Sound Water Quality Management Plan, such as the Monitoring Program and the Education and Public Involvement Program. To this end, the Puget Sound Foundation shall host an annual conference known as the Puget Sound Summit, assembling representatives of state and federal agencies, local and tribal governments, the public, and private business. These conferences shall be devoted to such goals as planning the Foundation's annual programs, improving our understanding of the obstacles to plan implementation, enhancing cooperation, and expediting Puget Sound cleanup.

Target Date: The Puget Sound Foundation shall begin to make grants to projects which address high-priority research and education needs by January 1, 1992.

[Status: This is a new program.]

F-2. Puget Sound Foundation Future Functions

As staff and funding become available, the Puget Sound Foundation shall carry out, in coordination with the Authority, the following functions of the Research and Education Programs:

1. Translation and dissemination of research results (R-1.4).
2. Information management (R-1.5 and PI-1.4).
3. Coordination with other programs (R-1.6).
4. Inventory of research reserves (R-1.7).
5. Support of existing interpretive centers (EPI-3.4); examine the need for new interpretive centers (EPI-3.5).
6. Visual representation of Puget Sound (EPI-3.4).
7. Post-secondary education for students and teachers (EPI-7.1). The Foundation shall provide the following opportunities for post-secondary students and teachers:

Case Study Scholarships and Internships. A program of internships for students and teachers shall be developed and shall include positions within the Foundation itself and in cooperating agencies and groups.

Credit Activities. The Foundation shall coordinate a program with Puget Sound area universities which allows students and teachers to receive appropriate

credit for attending related, Foundation-sponsored research and education conferences.

In addition, the Foundation shall develop the following research and education functions, simultaneously with the Authority, as staff and funding allow:

Speaker's Bureau. The Foundation shall convene a committee of private and public sector representatives to establish a speaker's bureau. Speakers will be screened both for comprehensive and accurate knowledge of a topic and for effective presentation. The Foundation shall make funds available for travel and a small honorarium for speakers and shall publicize the bureau.

Clearinghouse. The Foundation shall contribute appropriate information to any environmental clearinghouses established in the state, such as those in the Environment 2010 recommendations.

Target Date: The Foundation shall assume these functions from the Authority as staff and funding become available.

[Status: Funding has been proposed for these functions under elements R-1 of the Research Program and EPI-1 of the Education and Public Involvement Program for the 1991-93 biennium. This will be a new program for the Foundation for the 1993-95 biennium.]

MAJOR PUBLIC ACTIONS

None.

LEGISLATION REQUIRED

Potential federal legislation establishing a foundation and authorizing Congressional appropriations as matching funds for state and private dollars that are contributed to support the foundation's research and education grants program (F-1).

ESTIMATED COST

Resources identified for this program include state and federal funding, and private sector donations and grants. Funds available for the research and education grants programs (R-1 and EPI-8.2) will depend upon the success of the Foundation in raising funds from the private sector and upon the availability of federal appropriations.

Administrative and start-up costs of the Foundation are estimated to be approximately \$0.4 million per biennium. Costs of additional staff to administer elements of the plan's Research and Education and Public Involvement Programs are reflected in the estimates for those programs.

The annual meeting of the Foundation is estimated to cost \$60,000 each year, including contributions from agencies and the private sector, based on the costs and level of support that was provided for the First Annual Meeting on Puget Sound Research.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Puget Sound Foundation

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
F-1 Puget Sound Foundation	\$0	\$0	\$408,154	\$377,154	\$369,154
TOTALS	\$0	\$0	\$408,154	\$377,154	\$369,154

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Foundation	\$0	\$0	\$408,154	\$377,154	\$369,154
TOTALS	\$0	\$0	\$408,154	\$377,154	\$369,154

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$401,154	\$120,000	\$120,000
Federal Funding Sources	\$0	\$0	\$7,000	\$0	\$0
Private Funding Sources	\$0	\$0	\$0	\$257,154	\$249,154
TOTALS	\$0	\$0	\$408,154	\$377,154	\$369,154

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

HOUSEHOLD HAZARDOUS WASTE PROGRAM

PROGRAM ELEMENTS DIRECTORY

HHW-1. Phased Funding of Local Hazardous Waste Management Plans	137
HHW-2. Information and Education on Less-Toxic Alternatives for Household Products	137

PROBLEM DEFINITION

Household hazardous wastes come from a variety of toxic products used in the home: paints, paint thinners, lawn and garden pesticides and fertilizers, cleansers, degreasers, medicines, cosmetics, transformers, dyes, and automotive products such as antifreeze, batteries, and oil. The use and disposal of many of these products are chronic sources of pollution to Puget Sound, both in urban and rural areas.

Environmental Problems



Toxicants from household products enter the Sound as components of both point and nonpoint source pollution. Many of them are emptied down drains or flushed down toilets and enter municipal sewage treatment plants. Metro estimates that residential areas contribute 7 to 11 percent of the metals, 31 to 36 percent of the volatile organics, and 55 to 64 percent of the extractable organics to Metro sewage treatment plants. The percentage contribution of household toxicants to smaller treatment plants may be much larger. While secondary treatment degrades or dilutes some of these toxicants, others settle in the sludge, evaporate into the air, or continue in suspension or solution through the discharge pipe. Those in sludge or in the air can then enter Puget Sound through rains and runoff.

Many household wastes are disposed of at landfills. Toxicants can then be transported to the Sound when the landfill leachate is taken to municipal treatment plants or when the leachate in uncontained landfills contaminates surface runoff and groundwater. Many household wastes are dumped in storm drains, ditches, or backyards, where they contribute to nonpoint pollution by entering streams, rivers, and groundwater in both rural and urban areas. Fish kills in small streams can occur when oil, antifreeze, fertilizers, or pesticides are dumped by householders. Finally, household wastes are sometimes incinerated. They can then contaminate runoff through rainfall or through ash spread in yards, backyard pits, or even landfills.

Pesticides are not only a potential threat to water when they are disposed of improperly, but also when they are used improperly. A recent estimate is that home use accounts for approximately 20 percent of pesticide use in the Puget Sound region. Unlike other pesticide users, household users are not trained in proper application procedures or in diagnosing whether a particular pesticide is needed. Urban and suburban use of pesticides often occurs directly adjacent to pavement and storm drains, to ditches, or to streams and lakes. Pesticides applied excessively or in highly concentrated formulations can flow or leach in runoff into local waterways or seep into the groundwater.

With the growth that is expected in the region, urban uses of pesticides will increase as forest and agricultural land uses are converted to urban and residential uses. Home use will increase significantly. Because the urban population is not trained either in proper use or in proper disposal of pesticides, pesticides

will pose an increasing threat to the quality of urban stormwater runoff and to local lakes, streams, and marine waters.

Institutional Problems

Until recently, household hazardous wastes were not regulated. While quantities of many toxicants found in household products were prohibited from disposal at solid waste landfills, household quantities of these toxicants were accepted. However, in 1985 household hazardous wastes were included in the state Hazardous Waste Management Act under the definition of moderate risk waste. This put them into the same category of wastes as those generated by small commercial and industrial operations which use very similar products. While these household substances were technically regulated, there were very few legal, conventional, proper, or practical disposal mechanisms available to the householder or to small businesses. RCW 70.105.220 addressed this issue by mandating that local governments undertake a planning process to identify local moderate risk management options and to implement a management program by December 31, 1991. Local governments are required to have a management plan for these wastes, though the specific way by which the wastes would be regulated was left to the discretion of local governments. Implementation of this act was not initially funded.

The legislature specifically asked that the Authority address the issue of household hazardous waste education in the Puget Sound Water Quality Management Plan. The Authority found that with the exception of providing education on less-toxic household alternatives, educational efforts on household hazardous wastes would be frustrating and futile until household hazardous waste disposal options were available for all citizens. As a result, in 1987 the Authority recommended funding and implementation of the local hazardous waste planning process around the Sound.

The plans are near completion in all counties around the Sound. However, the majority of them are not being implemented. Funding and support must now be provided to implement the local plans. Otherwise, with the exception of sporadic collection events and a few permanent collection facilities, the dumpster, garbage can, ditch, storm drain, and backyard incinerator will remain as the principal disposal mechanisms for most citizens around the Sound.

Waste reduction is a priority of the local hazardous waste plans. In order to reduce wastes, citizens need education on alternatives to toxic household products, and they need convenient reuse and recycling options for major categories of household waste. Increasingly, reuse and recycling options are available for paints and solvents. What is not available is reliable and convenient options for oil recycling (and other automotive products) and education to reduce pesticide use.

Some local hazardous waste plans include pilot projects in oil recycling. However, full-scale implementation of oil recycling cannot be pursued because of the potential liability associated with contaminated oil. (The budget in the draft Thurston County hazardous waste plan included a contingency estimate that 10 per cent of the oil they received would be contaminated.) Gas stations will not accept oil from individuals because of the fear that the oil will have contaminants such as paint thinner or brake fluid which will then contaminate their own oil recycling container. Either a reliable, approved, low-cost test to identify contaminated oil must be found, or the system of assigning liability must be changed.

A reduction in pesticide use and disposal will not occur until significant numbers of urban and suburban residents are educated about pest management, the use of pest-resistant species, and proper pesticide application. This will require both research to determine alternative pest management practices tailored to this region and methods to get these practices to the home user through education and marketing. Agencies or groups such as Cooperative Extension, Tilth, and the Washington Toxics Coalition have conducted some research on these topics, but more is needed. Some nurseries are knowledgeable about pest-resistant species and native plants, but need more information and an educated market in order to sell them. Very few garden store retailers and very few garden writers encourage people to design and care for lawns in a way that will reduce pesticide use.

Through the 17-year old Master Gardener program and through the recent PIE-Fund program called Sound Gardening, Cooperative Extension has trained some gardeners in practices that protect water quality. The Washington Toxics Coalition and Tilth act as referral and information services and educate people through classes, brochures, displays, demonstrations, and newsletters. These programs are effective, but none of them have the staff and resources to train significant numbers of people. For local hazardous waste plans to achieve waste reduction with pesticides, these research and training programs will have to be augmented, and local governments will have to find the mechanisms to promote and market conservative use of pesticides. While gardeners may be a relatively easy target, homeowners and renters who simply want low-maintenance yards and landscaping will be more difficult to reach. They will not be available for training and will require short, direct messages, probably through the mass media or at the point of sale for pesticides or plants.

PROGRAM STATUS

This program provided for management of household hazardous waste through a phased implementation of local hazardous waste plans (RCW 70.105.220) and for education on less-toxic alternatives for household products. Under this program, King, Kitsap, Pierce, and Island counties received grants to act as pilot programs to complete their local hazardous waste management planning process by June 1989. The passage of Initiative 97 made funds available from the Toxics Control Account for all other Puget Sound counties to conduct the planning process. While the planning process in the pilot counties took longer than expected, much was learned from the pilot process which has been useful to all other counties statewide.

All 12 Puget Sound counties have submitted draft final plans both to Ecology for approval and to the local jurisdictions for adoption. Final adoption of all these plans is expected by June 1991. Ecology has prepared a status report on moderate risk waste that discusses the local plans and the overall management of moderate risk waste. Ecology estimates that implementing these plans in the Puget Sound region will cost approximately \$10 million a year.

The Authority and Ecology provided information on less-toxic alternatives for household products through the Authority's newsletter, *Soundwaves*, and through Ecology's pamphlet, *Turning The Tide*. The Washington Toxics Coalition continued to promote less-toxic alternatives and began researching and writing a series of fact sheets to verify some of the solutions offered in the *Turning The Tide* pamphlet.

Ecology's Solid and Hazardous Waste Program is carrying out a program to educate homeowners on safe use, storage, and disposal of home and garden chemicals.

Household hazardous waste collection days were held successfully throughout the region from 1987 to the present, many of them supported by the PIE-Fund. By 1990 at least one collection day had been held in every Puget Sound county.

PROGRAM GOAL

To improve management of household hazardous waste through the provision of appropriate disposal options and through public education on proper waste disposal practices, waste reduction, alternative to toxic substances, and pesticide management.

STRATEGY

The strategy for achieving this goal is to ensure full implementation of recent amendments to the Hazardous Waste Management Act, including waste reduction through oil recycling and conservative use of pesticides.

PROGRAM ELEMENTS

HHW-1. Phased Funding of Local Hazardous Waste Management Plans

[Element Completed]

[Status: Completed. This element recommended that the legislature appropriate funds to: (1) implement the preparation of local hazardous waste management programs (RCW 70.105.220-235) including public involvement in and education on the management of household hazardous waste; (2) accelerate the preparation of plans in a few Puget Sound counties for the purpose of early implementation; and (3) carry out those duties of the hazardous substance information office (RCW 70.102.020(4)) that were related to these activities.

Four pilot counties completed plans by February 1990. All other Puget Sound counties are on schedule to complete plans by June 1991. The hazardous substance information office has had limited involvement with this program because it was not funded to work with the program.]

HHW-2. Information and Education on Less-Toxic Alternatives for Household Products

Ecology and the Authority shall work with local governments, Cooperative Extension, retailers, and groups such as the Washington Toxics Coalition and the Adopt-A-Stream Foundation to collect and make information available on less-toxic alternatives to household toxicants. Ecology and the Authority shall distribute this information through their newsletters, the nonpoint planning and stormwater programs, other environmental education programs, and the PIE-Fund. Ecology shall continue to distribute this information through its 1-800-RECYCLE information line and through its waste reduction program.

Cooperative Extension shall work with the Department of Agriculture, local governments, and local groups such as Tilth, the Washington Toxics Coalition, the Washington State Nurserymen's Association, the Center For Urban Horticulture, and garden retailers to make information and training available to promote targeted and proper use and disposal of pesticides as part of the implementation of the local hazardous waste plans. Cooperative Extension shall consult with these groups on the type of information and programs needed and

shall include these groups where possible in the development and distribution of information through a regional pesticide education program. The pesticide education program is to support local household hazardous waste plan implementation. Ecology, the Authority, the Department of Agriculture, and Cooperative Extension shall facilitate funding for participating groups through contract processes such as the PIE-Fund or through joint grant proposals to foundations.

Target Date: Ecology and the Authority shall continue distribution of information through mechanisms available. Cooperative Extension hires staff and begins joint development of regional pesticide education program with other groups by September 1991. By December 1992 the pesticide education program will be contributing to all local government household hazardous waste programs which want support.

[Status: Ongoing. Ecology and the Authority have worked together to publish a series of articles on less-toxic alternatives in the Authority newsletter, Soundwaves and to distribute a brochure, Turning the Tide, on less-toxic alternatives. Turning the Tide has been revised and updated for a second printing. The PIE-Fund contracted for a model point-of-sale oil recycling program with local automotive products retailers such as Shuck's, Al's, and Fred Meyer and has provided support to the Seattle/King County local plan implementation through a household hazardous waste project in Kirkland. Ecology was not funded to research less-toxic alternatives.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

None.

LEGISLATION REQUIRED

None.

ESTIMATED COST

The proposed program would cost \$400,000 for the 1991-93 biennium, coming from the Toxics Control Account. All of the funds would provide Ecology and Cooperative Extension with the staff, materials, and contract monies to provide regional education in support of implementation of local government household hazardous waste plans and reduced use of toxic household products and pesticides.

Local governments bear no cost of the program elements in this plan. However, local governments incur costs in the development and implementation of Moderate Risk Assessment Programs required by the Hazardous Waste Management Act. The estimated cost of implementing MRW programs for 1991 ranges from \$20,000 for less populated counties such as San Juan to \$5,201,000 for larger populated counties such as King. Household hazardous waste collection and public education generally comprise 50 to 90 percent of the costs.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Household Hazardous Waste

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
HHW-1 Phased Funding for Plans	\$32,000	\$63,184	\$84,420	\$84,420	\$0
HHW-2 Info. on Less-Toxic Alternatives	\$0	\$140,000	\$408,332	\$403,738	\$403,738
TOTALS	\$32,000	\$203,184	\$492,752	\$488,158	\$403,738

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Cooperative Extension	\$0	\$0	\$332,196	\$332,196	\$332,196
Department of Ecology	\$32,000	\$63,184	\$160,556	\$155,962	\$71,542
Local Governments	\$0	\$140,000	\$0	\$0	\$0
TOTALS	\$32,000	\$203,184	\$492,752	\$488,158	\$403,738

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
State General Fund	\$32,000	\$63,184	\$0	\$0	\$0
Toxics Accounts	\$0	\$140,000	\$492,752	\$488,158	\$403,738
TOTALS	\$32,000	\$203,184	\$492,752	\$488,158	\$403,738

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

NONPOINT SOURCE POLLUTION PROGRAM

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PROBLEM DEFINITION

Nonpoint source pollution is a general category for pollution that is not collected in and discharged through pipes. It originates from contaminants collected in surface water runoff, discharges from boats and marinas, or atmospheric deposition. Nonpoint source pollutants include pathogens (as indicated by fecal coliform bacteria), sediments, nutrients, and toxicants. Most pollutants originate on the land, where they are picked up by rainwater and carried into streams and rivers that empty into the Sound. Because a bay can receive the drainage from a large land area (watershed) as well as discharges from boats and other water-based sources, sources are numerous and often can be difficult to individually identify.

Bacterial contamination has required the Department of Health to condition, restrict, or prohibit the harvest of shellfish at approximately one-third of Puget Sound's commercial shellfish growing areas.¹ The quality of shellfish growing waters is not improving: nine commercial shellfish beds have been reclassified to a more restrictive status since 1986. The major sources of bacterial con-

¹ The Department of Health classifies all actual and potential shellfish growing waters in Washington as Approved, Conditionally Approved, Restricted, or Prohibited.

tamination appear to be from nonpoint sources: increasing development of non-commercial farms, failing on-site sewage disposal (septic) systems, large commercial farms, and boats and marinas. In some cases, stormwater from newly urbanizing areas and exfiltration (leakage) from sewer mains adds additional bacterial and possibly toxic contamination to shellfish beds. (Existing urban areas typically have high levels of fecal contamination, and their shorelines were prohibited for shellfish harvest many years ago.)

Since the 1970s nonpoint sources (on-site septic systems, stormwater runoff, agricultural practices, boats, marinas, and forest practices) have been addressed through separate control programs, each one usually by a different government agency. These programs produced some important local successes. However, overall control of nonpoint pollution of the Sound was generally inadequate at the time of adoption of the 1987 plan. This was true partly because there was a lack of coordination among the agency programs and also because there was no integrated process to manage all nonpoint sources in a bay or watershed.

Adequate control of nonpoint pollution is becoming even more important due to the rapid population growth in the Puget Sound basin. Five Puget Sound counties accounted for over three-fourths of the state's total growth between 1980 and 1989. Along with population growth comes an increase in the many sources of nonpoint pollution. Since nonpoint pollution stems largely from human activities, successful control will require ongoing efforts to change peoples' understanding and behavior.

Failure to prevent nonpoint pollution (and impacts on beneficial uses like shellfish) also has resulted from a continual underfunding of programs at federal, state, and local levels. The state legislature established the Centennial Clean Water Fund (cigarette tax) in 1986 to provide dedicated funds for statewide water quality control facilities and activities, including nonpoint source control. Competition for the fund is becoming increasingly intense, especially as programs and activities accelerate. In addition, the fund was not designed to support state agency operations.

Stormwater Runoff

Stormwater, or surface water runoff, contains a complex mixture of suspended solids, nutrients, bacteria, viruses, and toxic materials. Residential, commercial, and industrial land uses have a much higher volume of runoff than rural land uses because urban land uses have a higher percentage of impervious areas. Impervious areas are hard surfaces such as rooftops, driveways, streets, parking lots, and highways.

In addition to creating water quality problems, poorly managed stormwater can lead to flooding and erosion problems. Poorly managed stormwater can cause rivers to flood and lakes to overflow their shores. Erosion from stormwater can cut away stream banks, degrade fish and wildlife habitat, and damage property.

The control of stormwater runoff is an important component of local watershed plans. Stormwater control is also being addressed on a Soundwide basis through the Stormwater and Combined Sewer Overflows Program in the Puget Sound plan (a more complete discussion of stormwater runoff is included in that program). Coordination is required in cases where there is overlap between a local watershed action plan and requirements under the Soundwide program.

On-Site Septic Systems

Failing on-site sewage disposal septic systems can discharge pathogens and household chemicals to streams, groundwater, and eventually Puget Sound. Failures occur because many soils in the Puget Sound region are poorly suited for conventional systems, because water tables are high, or because the systems are improperly designed, installed, or maintained. Many older systems have failed because they were designed to serve as temporary units for summer cottages or until an area was sewered. Today, approximately one-third of the residents in the Puget Sound basin are served by on-site systems. This fraction is increasing as more population growth occurs in semi-rural areas.

New on-site septic systems must comply with local health codes, which meet the minimum standards in regulations promulgated by the State Board of Health (Chapter 248-96 WAC; currently being revised). An estimated three to five percent of the systems in the Puget Sound region are currently failing (discharging directly to the surface of the ground or to surface water); most of these systems were installed prior to the adoption of the original state regulations in 1974. Current regulations do not have performance standards for existing systems, allowing many existing systems to provide inadequate levels of treatment (although some local jurisdictions require updating to current standards when building or remodeling additions are proposed).

State and local health agencies lack adequate funds for education and enforcement. When enforcement actions are taken, they are difficult to pursue to the point of achieving results. Existing regulations do not require system maintenance or inspections for proper functioning when property is transferred (although many loan insuring agencies and commercial lending institutions are requiring a system inspection and report as part of the loan process).

Agricultural Practices

Pollutants that can come from agricultural practices include sediments, nutrients, organic materials, pesticides, and pathogens. Pathogens arise from poor animal-keeping and pasture-management practices. Sediments, which carry pathogens and toxic contaminants and can damage salmonid habitat, can be generated by livestock trampling and eroding stream banks and by poor row crop practices.

State programs for control of nonpoint pollution from agricultural practices rely on voluntary implementation of best management practices (BMPs), with enforcement of water quality standards as a last resort. (Agricultural BMPs include, for example, manure lagoons, streamside fences, better management of fields, and crop rotation.) Conservation districts, the Cooperative Extension Service, and the federal Soil Conservation Service all provide technical assistance to farmers and promote farm planning and the use of BMPs. The Washington Conservation Commission and conservation districts are currently updating BMPs to ensure they are effective in protecting water quality. The Department of Ecology provides grant funding for cooperative agricultural construction projects, such as manure lagoons. Partial funding of BMPs by federal cost-share programs has been important in controlling sources at commercial farms. The U.S. Department of Agriculture has a new Water Quality Initiative to provide funds to states for projects controlling the effects of farm practices on water quality. While most of these programs address the needs of commercial farms, there is a need for additional funding and technical assistance to address the effects of noncommercial farms on water quality.

Forest Practices

Most of the rivers and streams that flow into Puget Sound have their origin in forested lands. Sediment from timber harvesting and road construction can damage fish habitat in these streams, which in turn can damage migratory species that are harvested in Puget Sound. Logging roads that were built and orphaned prior to the current Forest Practices Act can also lead to adverse impacts on water quality and fish habitat.

Forest practices are regulated by Washington's Forest Practices Act, RCW 76.09. Timber operators are required to submit applications to and comply with regulations administered by the state Department of Natural Resources. Other state agencies perform limited monitoring, review, and advisory functions. A serious deficiency in the forest practices program has been inadequate funding for enforcement and monitoring. With the adoption of the Timber/Fish/Wildlife Agreement in late 1986, improved agency coordination and increases in budgets have begun to address these concerns.

Marinas and Recreational Boating

Contaminants from marinas and recreational boating can include pathogens, petroleum products, and toxicants in antifouling paint.² Sewage discharge from boats is a potential problem during the boating season wherever boats congregate, but especially in smaller bays with poor water circulation, near shellfish beds and public swimming areas, and at marinas occupied by liveaboard boats. Many boaters, however, do not understand the water quality impacts that can result from boating activities.

In Puget Sound the Coast Guard is not actively enforcing federal regulations requiring marine sanitation devices (MSDs) to hold and/or treat boat sewage. Even with a vigorous enforcement program, widespread violations of discharge standards could still occur because enforcement cannot ensure the use of an MSD. In addition, major boating areas such as the San Juan Islands and Hood Canal lack sufficient pumpout facilities for holding tanks.

Most local shoreline master programs lack specific design standards for marinas that address protection of shellfish beds, pumpout and sewage treatment facilities, education, and runoff from boat repair and fueling facilities.

Pesticides

Pesticides from home, marine, forest, agricultural, or right-of-way use can contaminate streams, lakes, groundwater, and Puget Sound. Pollution can occur either from poor practices related to direct applications, or from improper disposal of unused pesticides. Pesticides are generally designed to be toxic to target organisms but are usually also toxic to a variety of other non-target plants or animals.

One study estimates that half of the pesticides used in the Puget Sound basin are used in urban areas. Many urban applications of pesticides occur directly adjacent to waterways—lawns, parks, and golf courses which border streams and lakes—and roadside ditches which feed local waterways. Pesticides applied to lawns, gardens, or street trees can be washed by rain or sprinklers into storm or sanitary sewers where they are conveyed to streams, lakes, or Puget Sound.

² Federal law enacted in June 1988 prohibits most uses of paints containing tributyltin, the antifoulant component most toxic to marine life.

The major regulatory authority for pesticide use rests with the Washington Department of Agriculture (WSDA), which also conducts enforcement. The major regulatory authority for pesticide waste disposal is Ecology. Ecology's Solid and Hazardous Waste Program has an active educational and compliance program on proper pesticide waste management targeted at commercial and public entities. Washington State University research faculty and the Cooperative Extension Service conduct the majority of research, training, and education programs. Traditionally, the majority of the staff and research resources of these programs have been directed at commercial agriculture and forestry. Commercial agricultural and forest applicators are trained and certified in proper pesticide use by WSDA and the Cooperative Extension Service, but there is no training or certification for home users other than the Cooperative Extension Master Gardeners program. Those interested in gardening should be easy to train; a more difficult audience to reach will be those residents who are not interested in gardening and use pesticides less discriminately.

Some local governments and utilities have initiated integrated pest management programs for roadside and utility rights-of-way. Research programs at WSU and through private groups such as Tilth have begun integrated pest management research and demonstration projects for agriculture, but their resources and activities are very limited.

Little is known about the effects of currently used pesticides on water quality, habitat, and biota. Monitoring and research programs are difficult to design because there is little accurate information about the types of compounds used in the region and the patterns of use. WSDA has the authority under RCW 17.21.100 to request pesticide application data from anyone who applies pesticides to more than one acre of agricultural land, but does not have the staff to do so. Agricultural includes forests, agriculture, and golf courses. Exercise of this authority would not provide use information from residential users.

PROGRAM STATUS

The nonpoint program integrates control of nonpoint sources at several levels of involvement—watershed, local jurisdiction (counties and cities), tribal, state, and federal. A cooperative watershed management program has been initiated that established committees to rank watersheds in each of the 12 Puget Sound counties. Watershed management committees are preparing action plans for watersheds in the order in which they were ranked.

To supplement the watershed action plans and address nonpoint source pollution outside of priority watershed boundaries, local and tribal governments evaluated the effectiveness of their existing water quality-related programs, policies, and ordinances. Counties are also carrying out nonpoint education activities in conjunction with the long-range education strategy.

Twelve early action watersheds were selected and funded by Ecology in 1987, six under the Round One process (NP-1) and six from Ecology's pre-existing Shellfish Protection Program.³ Watershed management committees (NP-3) were set up by early 1988 in each of the early action watersheds, and in 1990 most committees were in the final stages of plan approval. Over 20 implementation activities linked to early action watershed plans have been funded through

³ An additional watershed was funded through Section 205(j) of the federal Clean Water Act and was treated as an early action watershed.

the Centennial Clean Water Fund. Ecology also made a grant to the Northwest Indian Fisheries Commission to support tribal involvement in the early action phase of the watershed program.

In addition, each Puget Sound county established a watershed ranking committee and completed the long-term watershed selection process (NP-1, Round 2). Applications for the development of watershed plans in top-ranked watersheds in all but two counties have been funded through the Centennial Clean Water Fund.

Guidelines for the watershed management program (NP-2) were adopted as regulations (Chapter 400-12 WAC) by the Authority in early 1988, and two months later the Authority and Ecology issued the first chapters of the nonpoint source handbook for local governments and ranking and management committees. A complete version of the nonpoint handbook, *Managing Nonpoint Pollution: An Action Plan Handbook for Puget Sound Watersheds*, was published and distributed in June 1989. Ecology staff manage the watershed planning program through contract management, provision of technical assistance, plan review and approval, and other activities.

Ecology adopted a regulation in mid-1988 establishing funding criteria and procedures for the Centennial Clean Water Fund. This fund is the primary funding source for watershed management committees, action plans, and other water quality projects and activities (NP-5.1). There is concern on the part of many state agencies and local governments, however, that available funds will fall short of needs. Conservation districts are also being partially funded through this account via grants administered by the Washington Conservation Commission (NP-5.2). Like local governments, however, the Conservation Commission and conservation districts feel funding will prove to be inadequate. In addition, the Washington Conservation Corps continues to lack adequate funding to assist in implementation of watershed action plans (NP-5.3).

In late 1987 Ecology formed a technical assistance team that has aided watershed ranking and management committees (NP-6). Ecology will conduct audits (NP-7.1) and monitoring (NP-7.2) after implementation of watershed action plans begins. Guidance for county and city water quality evaluations (NP-9) was distributed by the Authority in July 1988, and evaluations were returned the following year. A final report on the evaluations was prepared and distributed to local governments.

The Department of Ecology completed a nonpoint source pollution assessment and management program in 1989 to comply with Section 319 of the federal Water Quality Act of 1987. The nonpoint program in the Puget Sound plan is incorporated into Ecology's statewide nonpoint management program, with enhancements for lakes and groundwater. Ecology's management program calls for accelerated implementation of watershed action plans in Puget Sound. Part of the first round of Section 319 funding is being used to support nonpoint activities in Puget Sound. Priorities for future Puget Sound funding from Section 319 will be established by the Puget Sound Estuary Program co-managers.

The Puget Sound nonpoint program also includes state programs for addressing nonpoint pollution from on-site septic systems, boats and marinas, and forest practices and for providing assistance to local governments in addressing pollution from on-site septic systems and agricultural practices.

The Department of Health completed local on-site program audits and expects to propose revisions to Chapter 248.96 WAC (on-site septic system regulations)

for consideration and adoption by the State Board of Health by January 1991 (NP-10). Proposed legislation to require information on septic systems to be provided when property is transferred (NP-11) passed the Washington State House of Representatives but failed in the Senate in both 1987 and 1988. The Department of Health is likely to include most of the provisions of this bill in the current revisions to Chapter 248.96 WAC. Health will also include NP-12 in the proposed on-site regulation revisions. Ecology has added new staff to implement the Dairy Waste Management Plan in Puget Sound (NP-13). The Conservation Commission, in coordination with Ecology, is studying the feasibility of a cost-sharing program (NP-14).

The Boaters Task Force prepared legislation providing a funding source for pumpout facilities and boater education that was passed during the 1989 legislative session. The State Parks and Recreation Commission also prepared a rule to govern contracts for pumpout facilities under the provisions of the new boat sewage pumpout contract program. The task force also developed the boater education program that is being carried out by State Parks. State Parks has installed pumpout facilities at Mystery Bay and Blake Island State Parks, and the Boaters Task Force identified another three more state parks where pumpout facilities will be installed (MB-5).

The Department of Health drafted a model ordinance for sewer hookups for liveaboards and prepared an accompanying technical report (MB-3). Health also completed an intensive survey of water and shellfish quality at five boating areas and prepared a summary report (MB-7). Implementation of Enforcement of MSD Regulations (MB-6), Study of No Discharge Areas (MB-8), and No-Anchorage Areas (MB-9), has not yet begun. Ecology has begun a process to develop Shoreline Management Act guidelines for design and siting of marinas (MB-2).

Implementation of the Timber/Fish/Wildlife Agreement began in 1987 with administrative changes at DNR; increased numbers of field agents at DNR and the Departments of Wildlife, Fisheries, and Ecology; participation of tribal governments and environmental representatives in TFW field and educational activities; and the development of a research and monitoring program. Several watershed management committees coordinated with TFW representatives during preparation of watershed action plans.

PROGRAM GOAL

To reduce and ultimately eliminate harm from nonpoint sources of pollution to Puget Sound, including pathogens, toxic contaminants, and sediment.

STRATEGY

The strategy for achieving this goal is to (1) target state, federal, and local resources on priority watersheds through a cooperative process of local watershed planning and implementation; (2) supplement the watershed plans with education and preventive programs; and (3) develop or enhance state programs or regulations for those nonpoint sources that are most effectively controlled at the state level.

PROGRAM ELEMENTS

NP-1. Selection of Priority Watersheds

[Completed portions of this element have been deleted.]

Selection of priority watersheds shall be in two steps: Round 1 or early action watersheds to be selected by Ecology from nominations and Round 2 consisting of a ranking of all watersheds in each county to be compiled by countywide committees.

Round 1. Early Action Watersheds:

[Status: This element called for selection of early action watersheds including existing Ecology shellfish protection projects and additional watersheds from nominations from local and tribal governments, special purpose districts, environmental and public interest groups, agricultural groups, state agencies, and other organizations. Nominations were based on the ranking criteria listed below.]

The early action watersheds include the six existing Ecology shellfish protection projects plus an additional six watersheds selected through the nomination process. One additional watershed was funded through Section 205(j) of the federal Clean Water Act and was treated as an early action watershed. Funding for these watersheds was provided from the Centennial Clean Water Fund. Selection of the early action watersheds was completed by the target date of June 30, 1987.]

Round 2. Long-Term Watershed Selection Process:

Watershed action plans shall be developed on an ongoing basis in the order that watersheds appear on each county's ranked list. Counties (or other appropriate lead agencies) are encouraged to help meet local goals for nonpoint pollution control by developing and implementing watershed action plans in the three highest ranked watersheds by 1996.⁴ Ecology shall work with counties not actively participating in the watershed planning program to identify reasons why they are not participating and to develop an appropriate strategy for addressing nonpoint concerns.

Watershed rankings shall be reviewed at least every five years, or sooner as needed. The county may develop a process for conducting the review that meets local needs, in accordance with the ranking criteria in this element and the public involvement policy (PI-1.1) in the Puget Sound plan. If changes are made in the county's ranking of watersheds, a summary of the changes and a brief rationale shall be prepared and submitted to Ecology.

Proposals to the Centennial Clean Water Fund for the development of watershed action plans according to Chapter 400-12 WAC shall be made in the order in which watersheds appear on each county's ranked list.⁵ Once a completed watershed plan has been approved by Ecology, additional CCWF projects ad-

⁴ Counties pursuing other related programs such as groundwater or stormwater may need to delay this goal slightly.

⁵ This does not preclude a public body from applying to the CCWF to conduct a needed project addressing some component of a comprehensive watershed plan, such as stormwater.

addressing nonpoint pollution in that watershed must be consistent with the approved watershed action plan.

Ranking Criteria

Committees shall use the following criteria for selection and review of priority watersheds:

- a. The watershed has a beneficial use such as recreational or commercial shellfish beds, fish habitat, or drinking water, that is impaired or threatened by pollution from nonpoint sources.
- b. The watershed has a likelihood of intensified land or water use, including a likelihood of being developed and/or logged, in the next 10 years.
- c. Environmental factors, such as soil, slope, and precipitation on land and/or limited flushing in the Sound increase the probability of future water quality degradation.
- d. The watershed produces more contaminants or causes greater harm to a beneficial use than other watersheds.
- e. Nonpoint source control programs in the watershed are likely to succeed in protecting water quality in Puget Sound as evidenced by programs already underway, existing institutional arrangements for interjurisdictional cooperation such as the Hood Canal Coordinating Council, or other factors.

Target Date: Development and implementation of watershed action plans is ongoing. As a goal, counties shall prepare and implement at least three watershed action plans by 1996.

Hood Canal

The Hood Canal Coordinating Council is an example of a watershed managed by interlocal agreements between three counties and two tribes. It was created after several years of discussion by an advisory committee formed in response to a directive by former Governor Spellman. An action plan, published in the summer of 1986, outlines procedures for dealing with nonpoint pollution problems in Hood Canal. The Council is currently implementing the septic system and farm animal provisions of the plan, as well as education activities and monitoring of shellfish beds; forest practices and boating activities will be part of the ongoing agenda.

[Status: The long-term watershed selection process required each county to convene a committee of representatives from cities, special purpose districts, tribal governments, and other appropriate entities to identify and rank all watersheds in priority order for the long-term development of action plans. The ranking process took place according to provisions outlined in the nonpoint rule (see element NP-2). The Puget Sound Cooperative River Basin Team developed a methodology for conducting the watershed ranking for use by watershed ranking committees. The team also provided technical assistance, as did Ecology and other state agencies, to many watershed ranking and watershed management committees. Each county submitted a report on the ranking process, including the final ranking, to the Department of Ecology by January 1988. The watershed rankings will be used to determine the order in which watershed action plans are developed locally with funding under the CCWF and the 319 Management Program.]

Done 11/1/89

NP-2. Guidelines for Watershed Action Plans

[Completed portions of this element have been deleted.]

2.1. The Nonpoint Rule

The purpose of the nonpoint rule (Chapter 400-12 WAC) is to establish a process to identify and rank watersheds in the Puget Sound basin and to develop action plans to prevent nonpoint source pollution, enhance water quality, and protect beneficial uses.

The Authority, in consultation with Ecology and interested participants, shall revise the nonpoint rule to incorporate needed changes identified through the early action planning process. The rule revision process shall include, but not be limited to: (1) minimum requirements for plan content, including an identification of what should remain in the rule and what should become guidelines; (2) minimum requirements for plan approval; (3) time frames for plan development, review, and approval; and (4) clarification of state and local responsibilities under the nonpoint rule and other related programs in the Puget Sound plan.

Thereafter, the Authority shall periodically review and revise the nonpoint rule. The Authority shall provide assistance to Ecology as necessary in interpreting the nonpoint rule.

Target Date: First rule revision initiated no later than January 1, 1991, and completed no later than September 30, 1991.

2.2. Action Plan Contents⁶

The watershed action plan shall include a water quality assessment and watershed characterization, problem definition, statement of goals and objectives, source control or pollutant control strategies, an implementation strategy, and a budget.

The goals of watershed action plans shall include meeting water quality, shellfish, and other appropriate standards in priority watersheds. The objectives of watershed action plans shall include reopening shellfish beds, preventing further closures, protecting fish habitat, and achieving other objectives appropriate to each watershed. Watershed action plans shall address nonpoint pollution, as applicable, from animal keeping/pasture management, on-site septic systems, stormwater, and any other potentially significant nonpoint sources in the watershed.

To expedite implementation, the early action watershed plans shall not be required to meet every detail of the rule but must be consistent with the intent of the PSWQA plan and as consistent as possible with Chapter 400-12 WAC.

The rule shall permit watershed management committees to select regulatory, voluntary, and/or educational approaches for addressing nonpoint pollution in the watershed. If regulatory programs are chosen, adequate enforcement must be provided; and if educational programs are chosen, agencies and/or in-

⁶ The nonpoint rule, Chapter 400-12 WAC, currently complies with this element, which will also be used to guide any subsequent rule revisions.

dividuals with expertise in education must be involved in program development and implementation. Watershed plans may be organized as appropriate to address the various pollutants of concern and/or their sources in the watershed.

Agricultural Practices. The use of conservation district/SCS farm management plans is the preferred approach to controlling pollution from both commercial and noncommercial farms (the conservation districts' farm conservation planning and practices documents are the recommended standard.) Watershed management committees may address animal keeping/pasture management through other regulatory or educational approaches, but the rule shall specify that any farm which has fully implemented an approved farm management plan through either the Dairy Waste Management Plan or the conservation district/SCS program shall be exempt from further agricultural practices regulations under the watershed action plan process unless water quality violations occur. (See also NP-13, Dairy Waste Management Plan.) The selection of an educational approach to controlling pollution sources shall not be construed to overrule or prevent the enforcement of existing regulations and laws by local, state, or federal agencies nor shall it be construed to exempt local governments from other requirements of this plan.

On-site Septic Systems. Action plans shall include approaches for controlling nonpoint pollution from on-site systems, including regulation, education, on-site system maintenance programs, and the use of alternative systems in appropriate areas. Compliance with Chapter 248-96 WAC is required. In particular, any existing dwelling unit or other premises served by a failing on-site sewage system or a nonconforming repair shall be connected to a public sewer system when there is adequate public sewer available within 200 feet of the dwelling or premises, and when connection is permitted by the sewer utility. The 200 feet shall be measured along the usual or most feasible route of access. This requirement by the sewer utility may be waived if the health officer determines that adequate site conditions exist which allow the installation of a replacement on-site sewage system.

Stormwater. Action plans addressing stormwater shall be consistent with requirements in the stormwater rule (element SW-4), and other requirements under elements SW-1 and SW-2 of the Stormwater and CSOs Program and applicable federal requirements.

Forest Practices. Watershed action plans which include forest practices must coordinate with the provisions of the Timber/Fish/Wildlife agreement in cases where state law preempts local action of forest practices, especially in the areas of pre-planning and basin planning, enforcement, data management, orphaned roads, and extended review. Action plans shall also address the role of local government in controlling the water quality impacts of conversion of forested land to other uses.

Marinas and Boats. Action plans addressing marinas and boats shall be coordinated with activities taking place in the Marinas and Recreational Boating elements of the Puget Sound plan (elements MB-1 through MB-8). Plans shall include education of the public, marina operators, and boaters, as well as the adoption of needed local regulations.

[Status: The Authority adopted regulations for Local Planning and Management of Nonpoint Source Pollution (Chapter 400-12 WAC) in February 1988 (a summary of the nonpoint rule is contained in Appendix E). Thirteen early action watersheds have been developing watershed actions plans under the provisions of the intent of the rule. Ecology has been administering the watershed planning program

through the efforts of several divisions. Ecology has organized several meetings for the benefit of early action watershed staff, and Ecology and the Authority jointly sponsored two workshops. The Authority and Ecology conducted an evaluation of the watershed planning program in early 1990 (Watershed Planning Program Evaluation Report; copies of the report are available from the Authority).]

2.3. Nonpoint Handbook

The Authority, in coordination with the Departments of Ecology and Health, shall revise and reprint the nonpoint handbook, as necessary.

[Status: The Authority prepared a handbook for use by local watershed management committees in developing watershed action plans. The first installment of the nonpoint handbook was distributed on March 30, 1988. The final version of the handbook, Managing Nonpoint Pollution: An Action Plan Handbook for Puget Sound Watersheds, was printed and distributed in June 1989. Copies of the handbook are being distributed to members of watershed committees operating under the provisions of the nonpoint rule.]

NP-3. Watershed Management Committees

When funding becomes available for each priority watershed, the appropriate lead agency is responsible for convening a watershed management committee. If two or more counties share a watershed, the counties may agree on a temporary lead to convene the committee or may jointly convene the committee.

The county is presumed to be the lead for each watershed management committee. However, the committee may designate a city, a local health agency, a conservation district, or other agency if circumstances warrant.

It is the intent of the Authority that watershed committee membership include all entities that have a legitimate role in the development and implementation of a watershed action plan. This includes affected local and tribal governments, special purpose districts, affected parties,⁷ watershed residents, and appropriate state and federal agencies (if the watershed includes significant state or federal lands or regulatory role). Additional advisory committees may be established as necessary and agreed upon by the committee members.

The watershed management committee shall be responsible for developing the action plan. The lead agency shall be responsible for setting up the watershed committee, convening meetings, coordinating among local jurisdictions and other agencies, working with planning and implementing agencies⁸ in preparation of the plan, compiling and publishing the plan, and submitting the plan to

⁷ Affected parties are defined as both those whose beneficial use of water is being impaired, or potentially impaired, by nonpoint pollution and those groups associated with the various sources of nonpoint pollution. Examples of affected parties include agricultural groups, realtors, environmental groups, etc.

⁸ For the purpose of this program, a planning agency is the agency that prepares reports and makes recommendations, and an implementing agency is the agency that carries out the day-to-day activities of the plan once it is adopted by a county and/or city council. An agency could be both a planning agency and an implementing agency, for example, a health department could both propose regulations for on-site systems and enforce them after they have been adopted by the county council or commission. In watersheds with two or more counties or cities there could be several implementing agencies for the same source, for example, two different health departments carrying out on-site programs prepared by a single planning agency and adopted by the two different county councils or commissions.

Ecology for approval. Watershed management committees are encouraged, but not required, to use consensus in making major decisions relating to the watershed plan.

The watershed action planning process shall include public participation. In addition to representation on the watershed committee, the public shall be educated and involved in decision-making through such activities as public meetings and hearings, watershed events, citizen workshops, open houses, and newsletters. Watershed committees are encouraged to take advantage of coordination and training opportunities under EPI-2.

Each potential planning and implementing entity shall evaluate those provisions of the draft action plan which require the entity's involvement, and shall submit a statement indicating its concurrence with the specified action or a statement of nonconcurrence, proposing necessary modifications.

[Status: This element is proceeding on schedule. Funding was provided from the first two rounds of the Centennial Clean Water Fund (fiscal years 1989 and 1990) to prepare watershed plans in 14 additional watersheds.]

NP-4. Plan Adoption and Implementation

Each watershed action plan submitted to Ecology for approval shall meet the following minimum requirements specified in the (revised) nonpoint rule and shall be consistent with the goals and requirements of the Puget Sound plan:

- a. The plan must have been developed by a watershed management committee in accordance with the process described in the nonpoint rule;
- b. The plan must contain a statement of goals and objectives, a summary of the water quality assessment and watershed characterization, and a problem definition;
- c. The plan must specify a set of measures/actions to be carried out by implementing agencies to address the significant pollutants or sources of nonpoint pollution in the watershed and to help meet the goals and objectives of the plan;
- d. The plan must include a budget and implementation schedule; and
- e. The plan must include statements of concurrence from agencies responsible for implementing the recommendations made in the plan.

It is the intent of the Authority for watershed plans to be developed in such a way that they are adapted to the unique needs of each watershed.

Ecology shall have 60 days to approve/disapprove the plan. Ecology shall approve final action plans that meet the minimum requirements of the nonpoint rule and other appropriate grant requirements. If a plan is not approved, the watershed management committee shall revise the plan as necessary and the lead shall negotiate with Ecology for final approval. Ecology may approve portions of a plan before approving the entire plan and require those portions to be implemented during the revision process for the remainder of the plan.

Each implementing agency identified in the plan approved by Ecology shall be responsible for carrying out its portion of the watershed action plan using the approaches described in the plan. The lead implementing agency shall be responsible for coordinating among implementing agencies and for preparing

reports to Ecology. Each local, state, and federal implementing entity identified in an approved action plan shall be responsible for carrying out its portion of the action plan within the prescribed schedule.

Watershed action plans may be revised by watershed management committees following submission of revisions to and approval by Ecology. Ecology may require revisions based on biennial audits, subject to available funding.

[Status: All 13 early action watershed plans were submitted for review by appropriate state and local entities, and statements of concurrence were prepared. Of the early action plans submitted for Ecology approval, nine have received final approval as of November 1990.]

NP-5. Program Funding and Incentives

In addition to the following elements, new funding sources for nonpoint pollution management may be identified or proposed as the result of a study of potential funding sources to support the long-term implementation of the Puget Sound plan (element C-1, Study of Long-Term Funding Options, and element EM-7, Shellfish Funding Strategy).

5.1. Nonpoint Watershed Grants

The Department of Ecology shall administer a program for disbursing grant funds from the Centennial Clean Water Fund, the 319 Management Program, and other sources to watershed management committees for preparing and implementing watershed action plans. Disbursal of grant funds to agencies may be funneled through the lead administrative agency or paid directly to implementing agencies according to procedures established in the Centennial Clean Water Fund (see element NP-1). Lead agencies for watershed plans are also encouraged to apply to the State Revolving Loan Fund and other state and federal funding sources for eligible projects, and to identify locally-based sources of funding.

To ensure full participation of tribal governments in watershed planning, tribes are encouraged to evaluate their desired level of participation in watershed management committees. Tribal governments may submit grant applications to Ecology either simultaneously with lead agency applications or as an integrated part of lead agency applications. Tribal governments are also encouraged to coordinate with other tribes in the grant application process.

5.2. Funding for Conservation Districts

Ongoing funding shall be provided by the Washington Conservation Commission to enable Puget Sound conservation districts to participate in planning and implementing priority watershed action plans. The Authority recognizes the need for ongoing funding to maintain districts' basic administrative functions and expects that such funding will be made available, within the limitations of statewide responsibilities and a competitive grant process, from the 2.5 percent appropriation to the Commission from the Centennial Clean Water Fund.

5.3. Continued Funding for Washington Conservation Corps

The Department of Ecology shall request funds through its biennial budget process for the Washington Conservation Corps to allow it to continue to provide assistance in implementation of activities under the Puget Sound plan.

5.4. Tax Assessment of Stream Corridors with Restricted Use

In instances where property owners have fenced along streams as part of a watershed action plan, the Dairy Waste Management Plan, or an approved farm management plan through the SCS/conservation district program, counties should consider granting open space tax status pursuant to the Open Space Act (Chapter 84.34 RCW) to lands with restricted use resulting from fencing.

5.5. Federal Funding

The Authority and Ecology shall actively seek ways to provide federal funding for the preparation and implementation of watershed action plans. Specifically, funding from Section 319 of the federal Water Quality Act of 1987 shall be used to accelerate local watershed planning, as specified in the approved 319 management program. Priorities for 319 funding in the Puget Sound region shall be based on the Puget Sound plan (as stated in the 319 Management Plan) and shall be developed jointly by the Authority, EPA, and Ecology, as co-managers of the PSEP. If Ecology wishes to modify the PSEP priorities, given the need to coordinate an overall statewide request and address lakes and groundwater, Ecology shall work with the PSEP Management Committee to develop a revised request. The PSEP Management Committee shall continue to identify additional federal funding sources that can be applied to watershed planning such as the USDA Water Quality Initiative.

[Status: Watershed grants have been made for both development and implementation of watershed action plans. In addition to the early action watersheds, grants have been made from the CCWF to develop watershed action plans in 14 top-ranked watersheds. Over 36 implementation projects in the early action watersheds, including the activities of local conservation districts, have also received funding from the CCWF. Tribal governments received funding through the Northwest Indian Fisheries Commission to participate in early action planning, and have been applying to the CCWF to sustain continued involvement. The state Conservation Corps formed a watershed "SWAT" team and has provided assistance in three early action watersheds.]

NP-6. Technical Assistance for Watershed Plans

[Completed portions of this element have been deleted.]

Ecology shall continue to coordinate among Interagency Technical Assistance Team (ITAT) members to keep them active and informed and shall continue providing watershed committees with clear direction as to which individuals/agencies to call directly for specific types of assistance. Ecology shall ensure that technical information and assistance provided under this program is coordinated with the federal assistance provided by the Puget Sound Cooperative River Basin Study Team, other Ecology nonpoint-related grants programs (such as 205(j) grants), the boater education program (element MB-4), and the Ecology and Health shellfish protection programs. Team members and watershed committees are encouraged to use resources provided through the Education and Public Involvement Program in the Puget Sound plan in conducting education associated with watershed action plans.

ITAT members are responsible for tracking development and implementation of watershed action plans in their areas of technical expertise, providing technical assistance to watershed committees throughout the watershed planning process, coordinating technical assistance within their agency and with other appropriate agencies, facilitating the statements of concurrence process for their agency, participating in plan review, and serving as an agency contact person. Information on actions which should not be proposed in watershed action plans because

of state or federal preemption should be made available to watershed management committees early in the planning process.

The U.S. Department of Agriculture Soil Conservation Service shall continue to act as lead for the Puget Sound Cooperative River Basin Team and shall provide continued funding, in coordination with cooperating agencies, beyond 1992 when the team's current funding is scheduled to terminate. The Authority, Ecology, and EPA, as PSEP co-managers, shall seek ways to involve federal agencies in addition to those on the River Basin Team in providing technical assistance to watershed planning and implementation activities. Federal agencies shall also work with local governments to resolve cases where federal programs may conflict with local goals in a watershed action plan (in accordance with Section 313 of the Water Quality Act of 1987).

[Status: In 1987 Ecology formed an interagency technical assistance team (ITAT) consisting of staff from the Departments of Ecology, Health, Wildlife, Fisheries, Natural Resources, and Agriculture; the Authority; the Washington Conservation Commission; the State Parks and Recreation Commission; the Cooperative Extension Service; tribal governments; and other appropriate state agencies to provide technical assistance to each watershed management committee throughout the planning and implementation phases of watershed action plans. This team, in conjunction with the Puget Sound Cooperative River Basin Study Team, has been assisting watershed management committees. Team members have worked with their agencies to provide information to watershed committees, reviewed draft plans, and helped obtain statements of concurrence where applicable. Ecology has prepared an orientation session for new watershed committees.]

NP-7. Program Management

7.1. Audits

Ecology, in cooperation with the Authority, shall audit each watershed action plan every two years to ensure consistent and adequate implementation. Audits shall address information such as the status of plan implementation, staff and financial resources dedicated to carrying out the plan, results of monitoring data, and other topics relevant to plan implementation.

7.2. Monitoring

Ecology (or Ecology and the Department of Health for watersheds in which shellfish or drinking water is an issue) shall monitor water quality as appropriate in each priority watershed. The purpose of the monitoring shall be to provide information for measuring the success of action plans in achieving water quality goals. Watershed monitoring shall be coordinated with the Puget Sound Ambient Monitoring Program, including use of the Puget Sound Protocols and Guidelines. Ecology shall make data available, upon request, for transfer to the PSAMP central database using data transfer formats developed under element M-4.

7.3. Default Watersheds

Ecology shall work directly with local governments which fail to prepare watershed action plans to identify reasons why and to develop an appropriate strategy for addressing nonpoint concerns. If local governments fail to prepare and implement nonpoint watershed action plans, the Authority shall follow procedures in RCW 90.70 and in element EM-8 of this plan to seek action. Ecology shall use its regulatory authority under Chapter 90.48 RCW to require that water

quality problems are corrected and, as a last resort, may prepare a watershed action plan. In the event of nonperformance or unsatisfactory completion of watershed action plans, Ecology may require repayment of grant funds disbursed to grantees.

7.4. Program Management and Evaluation

Ecology shall be responsible for overall nonpoint program management and shall provide ongoing oversight of watershed action plans. Management shall include program planning, intra- and inter-agency coordination, financial monitoring, public outreach, information management, enforcement, and evaluation activities for all nonpoint program elements except NP-9 through NP-12, and marinas and recreational boating elements for which Ecology is not lead. The effectiveness of the nonpoint program, including the effectiveness of the watershed planning program and consideration of the need for more prescriptive standards, shall be evaluated by the Authority as part of each revision of the Puget Sound plan.

Target Date: Ecology shall report progress on this element in its reports to the Authority.

[Status: The Authority conducted an evaluation of both the watershed ranking and the early action watershed planning processes. It is too early to evaluate the effectiveness of watershed action plans in terms of actual water quality benefits, although specific changes in the nonpoint rule are recommended as a result of the evaluation. Local watershed monitoring is taking place under the guidelines for watershed action plans (NP-2).]

Countywide Programs

NP-8. Education Programs

[Moved to EPI-2.]

[Status: Countywide education on nonpoint pollution will be conducted as part of the Education and Public Involvement Program. Counties will identify priorities and programs for nonpoint education as part of their work with local field agents (EPI-2.1) and utilize the assistance of training teams (EPI-2.3) as appropriate for citizen education.]

NP-9. Prevention

[Element completed.]

[Status: Using guidance prepared by the Authority, each city and county in the Puget Sound planning area was asked to conduct an evaluation of (a) the effectiveness of their programs relating to water quality, and (b) the effects on water quality of other programs not specifically focused on water quality for that portion of its jurisdiction within the Puget Sound planning area. Each jurisdiction was asked to involve the public in the evaluation and submit a written report to the PSWQA.]

The following specific information was covered in the evaluations:

- a. How water quality considerations are incorporated into land use decisions.*

- b. *The effectiveness of its regulations for new on-site systems, including the soil types and other conditions under which they are permitted. Effectiveness in this case refers to protection of public health and water quality.*
- c. *The need for on-site system maintenance programs to protect both public health and water quality.*
- d. *The effectiveness of local enforcement programs for zoning, shoreline, and health regulations affecting nonpoint pollution. (To be coordinated with Legal and Personnel Support element LP-4, now element EM-10.)*

Recognizing tribal sovereignty, the Authority also requested that tribal governments conduct similar evaluations. The Authority worked with the Northwest Indian Fisheries Commission and individual tribes to design an evaluation of tribal programs that can be used by tribal governments.

Approximately 35 local jurisdictions conducted evaluations and returned their results to the Authority. The Authority prepared and distributed a report that analyzed the evaluations in March 1990. Results of the evaluations were used to prepare the 1991 plan, especially in the areas of financial assistance to local governments for plan implementation activities. The guidance for tribal evaluations was prepared by the summer of 1989, and the Northwest Indian Fisheries Commission is working with tribal governments in conducting the evaluations.]

State Elements to Supplement Local Planning

NP-10. On-Site Regulations and Programs

[Completed portions of this element have been deleted.]

The Department of Health shall continue revising Chapter 248-96 WAC for adoption by the State Board of Health.

[Status: The Department of Health completed a study of the effectiveness of current statewide standards for on-site systems, including recommended strategies for maintenance and remedial programs for on-site systems. The study included audits of the local on-site programs in all 12 Puget Sound counties, special attention to sensitive areas, and an evaluation of several specific issues. The results of the study were presented to the Authority in March 1990. As a result of the study, in October Health presented a proposal for revised regulations to the State Board of Health.

Health completed the audits of local on-site programs and part of the revisions to Chapter 248-96 WAC. Health anticipates completing the entire revision by 1991.]

Target Date: Adopt regulations by January 31, 1991. Develop recommended maintenance and remedial strategies and begin implementation by July 1, 1992.

NP-11. On-Site Inspections and Education

[Status: Legislation requiring inspection and education at the time of property transfer failed in 1987 and 1988. The Department of Health's current proposals for revisions to Chapter 248-96 WAC (NP-10) include most of the activities and techniques called for in this element.]

**NP-12. Certification
of On-Site
Professionals**

The Department of Health shall develop a program, including any required legislation or amendments to WAC 248-96 and RCW 18.43.070, for state certification of designers (including professional engineers), installers, environmental health specialists, and others involved in the design, installation, and maintenance of on-site septic systems. Health shall require all on-site systems to be installed, designed, given permit approval, and inspected by certified professionals. As part of this program, Health shall conduct a continuing education program for certified professionals.

Target Date: Begin program implementation by June 30, 1992.

[Status: The Department of Health began implementation of this element in February 1988 by developing a work plan, surveying other states' certification programs, contacting potentially affected parties, and studying the need for legislation. The certification program is currently included in Health's proposed revisions for Chapter 248-96 WAC. Some local governments, such as King, Pierce, and Snohomish Counties have ongoing certification programs.]

**NP-13. Dairy Waste
Management Plan**

The existing Dairy Waste Management Plan shall be funded to focus on priority watersheds, and Ecology shall be encouraged to continue its use for commercial dairies regardless of size. Conservation districts and counties are encouraged to pursue the adoption of special assessments to finance ongoing conservation district activities under the provisions of Chapter 89.08.400 RCW.

Any farm which has fully implemented a farm management plan through either the Dairy Waste Management Plan or the conservation district/SCS system shall be exempt from further regulations on animal keeping/pasture management under a priority watershed action plan unless water quality violations occur.

[Status: Ecology is carrying out this element. Conservation districts are applying to the Conservation Commission for funds provided from the Centennial Clean Water Fund, since a major source of funding for this program (Referendum 39) ran out in 1988. Ecology and the Conservation Commission completed a compliance memorandum of agreement that has been signed by Puget Sound conservation districts. Federal funding from Section 319 of the Water Quality Act has been allocated for Dairy Waste activities in Puget Sound.]

**NP-14.
Cost-Sharing
Program**

Ecology and the Washington Conservation Commission shall continue designing a cost-sharing program for animal keeping, pasture management, on-site systems, or other situations where BMPs are required by priority watershed action plans. Legislation shall be prepared if appropriate.

Target Date: Program in place by June 1991.

[Status: The Conservation Commission has compiled background material on this topic. Ecology built on this work by developing an internal policy allowing the use of the CCWF for cost sharing on certain agricultural BMPs.]

**NP-15. Larger and
Alternative On-Site
Systems and Septage**

The Department of Health, with assistance from Ecology, shall expand its program for larger on-site systems and alternative systems. The program shall provide: (a) an inventory of systems; (b) a performance analysis and an assessment of the need for new performance, siting, or other requirements; and (c) maintenance of a data base. This program shall also include an investigation of exist-

ing requirements and procedures for disposal of on-site sewage from recreational vehicles.

Health shall provide technical assistance and training on such systems for local health agency staff and shall prepare design, performance, and other manuals and materials as needed. Health, along with Ecology, shall conduct a literature review, develop a handbook, and provide training and technical assistance for local governments on the environmentally sound disposal of septage.

Target Date: Complete inventory and recreational vehicle investigation by June 30, 1992. Prepare manuals by January 1, 1993. Conduct septage literature review and prepare handbook by July 1, 1992.

[Status: Pending.]

NP-16. Pesticide Usage Surveys In Selected Watersheds

Washington State University Cooperative Extension shall act as the lead to design pilot pesticide usage surveys for selected watersheds in the Puget Sound Basin. Cooperative Extension shall include appropriate agencies, scientists, and local governments in designing and conducting the surveys. The surveys should define spatial and temporal usage patterns; focus specifically on pesticides of concern in the watershed; include information from all major users, including homeowners; and identify storage and disposal practices.

Target Dates: Cooperative Extension and the Department of Agriculture shall hire staff by September 30, 1991. Surveys will be completed and results compiled for two watersheds by March 30, 1993.

[Status: This is a new element.]

NP-17. Puget Sound Pest Management Information Program

Washington State University Cooperative Extension shall act as the lead to work with the Puget Sound Estuary Program, National Oceanic and Atmospheric Administration, and the Department of Ecology's Groundwater, and Solid and Hazardous Waste programs, to find funding for and to establish a Puget Sound Pest Management Information Program. Cooperative Extension will design and implement program activities with an advisory group consisting of representatives of appropriate agencies, local governments, nonprofit organizations, business and industry groups, and educational and media groups. The program will work through existing institutions and groups, including the King County Roads Division program on integrated pest management, to conduct research and education on integrated and targeted pest management, promoting conservative use of pesticides particularly by local governments and home users.

Cooperative Extension shall facilitate or conduct collaborative demonstration research on pest management with local governments, state agencies, and private sector groups. Local governments and state agencies shall identify the pest management issues which should receive priority for research.

Local governments and state agencies shall adopt practices which are demonstrated to be effective by the program. The Authority shall establish a process to designate effective practices.

Priority will be given to research and promotion of pest management practices which will ensure the greatest protection to water. The program shall be designed to coordinate with statewide needs for education and research on pest management in urban areas.

Cooperative Extension shall provide resources to the local watershed management committees (NP-3), the Ecology 1-800-RECYCLE line, and local hazardous waste management plans (HHW-1, HHW-2), and shall act as members of the Pest Management Training Team (EPI-2.3).

Target Dates: Cooperative Extension shall hire a person to initiate the program by November 30, 1991. The advisory group shall be formed by January 1992. By June 1992 a partial data base and educational activities shall have begun for the Puget Sound region. By September 1992 two demonstration research projects will have been identified and begun. By January 1993 the program will be providing support to local governments as they implement hazardous waste management plans (HHW-2). By September 1993 the Authority and Cooperative Extension will have established a process for agencies and local governments to adopt practices which are demonstrated to be effective through this program.

[Status: *This is a new element.*]

Marinas and Recreational Boating

[NOTE: The marinas and recreational boating program shall focus on recreational boating because of its widespread occurrence throughout Puget Sound. However, small (less than 65 feet in length) uninspected commercial vessels using areas where nonpoint pollution from boats has been identified as a problem shall be subject to education and enforcement programs. Education of the commercial fishing industry is also addressed in the Spill Prevention and Response Program (SP-11).]

MB-1. Coordination of Marinas and Boating Elements

1.1. State Agency Coordination

With the Authority as lead, Ecology, Health, State Parks, and the Authority shall work as a task force on coordinated implementation of the following measures:

- a. For new and expanded marinas and floating homes:⁹ Shoreline Master Program Amendments prepared by the Department of Ecology as described in MB-2 below;
- b. For existing marinas: (1) Educational activities addressing appropriate sewage disposal as well as other water quality impacts at marinas in coordination with MB-4 below; and (2) A model ordinance to address sewage disposal needs of boats using public and private marinas as described in MB-3 below.¹⁰

⁹ "Floating home" means a structure designed substantially as a permanently based structure and not as a vessel. It is typically characterized by permanent utilities and a semi-permanent anchorage/moorage design, and by the lack of adequate self-propulsion to operate as a vessel.

¹⁰ Ecology plans to begin preparing a general statewide permit for marinas during the summer of 1992. This permit will adopt the provisions suggested in the model ordinance by reference, and will be coordinated with ongoing activities under the boater education program (element MB-4) and the shoreline master program guidelines (element MB-2).

- c. Development of a means to evaluate the effectiveness of the actions to address water quality impacts from boats and marinas as called for in elements MB-3, MB-5, MB-7, and MB-8. This shall include such measures as the number of pumpout stations sited around the Sound, data on pumpouts use, etc.

1.2. Public Involvement

The Shoreline Master Program Guidelines (MB-2), model ordinance revision (MB-3), and other appropriate tasks shall be carried out with the assistance of an advisory committee or committees representative of local and tribal governments, ports, the boating community (liveaboards and recreational boaters), marina owners and operators, the marine trade industry, and appropriate state and federal agencies.

Interested members of the public shall be kept informed of the activities under MB-1.1.

Target Date: State agency task force meets bimonthly beginning February 1991.

[Status: This is a new element.]

MB-2. Shoreline Master Program Amendments for Marinas

Ecology, in coordination with Health, shall issue guidelines to include specific standards for siting, design, renovation, or expansion of new marinas, existing marinas, and associated fuel docks and boat repair facilities. The guidelines shall include standards for new and expanded marinas to prevent any restriction in the use of commercial and recreational shellfish beds and specific regulations requiring best management practices to control pollutants from boat use, maintenance, and repair. The revised guidelines shall also specify that local governments must, at a minimum, condition shoreline permits for marinas to require the use of best management practices, boater education, and proper boat sewage disposal facilities, including specific provisions for ensuring that pumpouts are accessible and maintained. The guidelines shall also address means for controlling water quality impacts from floating homes and barge homes not otherwise prohibited.

Local jurisdictions shall amend their shoreline master programs to be consistent with the revised guidelines.

Target Date: Guidelines revised by July 1992. Local shoreline master programs amended by January 1994.

[Status: Ecology has revised the Shoreline Master Program Handbook (technical guidance for local government) to include specific information on marinas. In addition, Ecology is requiring local jurisdictions amending the marinas section of their shoreline programs to include requirements for sewage pumpout facilities, runoff control, and other best management practices where appropriate.]

MB-3. Model Ordinance for Sewage Disposal at Marinas

The Department of Health shall revise the model ordinance for liveaboards prepared under the original language of this element to address sewage disposal needs for all boats using public and private marinas. The model ordinance shall provide sewage disposal options addressing the needs of boats, whether long- or short-term tenants. Local governments whose jurisdiction includes marinas shall

be contacted within six months after completion of the ordinance and encouraged to adopt it.¹¹

MB-4. Boaters Task Force

[Completed portions of this element have been deleted.]

[Status: The State Parks and Recreation Commission formed a task force consisting of representatives from the boating community, the Authority, the Departments of Health, Fisheries, Natural Resources, Ecology, the Interagency Committee for Outdoor Recreation, tribal governments, shellfish growers, marina owners, the Washington Public Ports Association, the marine sanitation industry, owners of small commercial vessels, and other appropriate entities to accomplish two tasks. First, State Parks worked with the task force to design a boater education program with the following purposes:

- a. Encourage the use of marine sanitation devices (MSDs) in shallow water bays and other sensitive areas.¹²*
- b. Discourage anchoring near shellfish beds.*
- c. Encourage environmentally safe habits in the use of antifouling paint, cleaning agents, and petroleum products.*

Second, they were asked to prepare legislation requiring sufficient pumpout facilities at existing and new moorage facilities (marinas, yacht clubs [including outstations], and parks with moorage). The legislation was also supposed to specify (or require a rulemaking process to specify) operating characteristics of pumpouts including water depth, pumping pressure, maneuvering room, fees, and operating hours.

The Boaters Task Force assisted State Parks in developing the boater education program and the pumpout legislation. Because these tasks have been completed, the task force has been disbanded. The legislation was submitted and passed during the 1989 session, providing a funding source for the installation of sewage pumpout facilities, boating safety activities, and boater environmental education. State Parks has developed rules for distributing funds under the boat sewage pump out contract program established by the legislation.]

4.1. Boater Education Program

The State Parks and Recreation Commission shall continue implementing the boater education program developed by the Boaters Task Force:

¹¹ The discharge of untreated sewage from boats at a marina is currently illegal under the general provisions of the Clean Water Act. The provision of a model ordinance is intended to assist local governments in dealing with illegal discharges from liveaboard boats. The discretionary nature of the ordinances does not mean discharge of sewage is legal where such ordinances have not been adopted.

¹² Sensitive areas are defined as restricted water bodies where discharge of untreated sewage from boats is especially detrimental because of limited flushing, shallow water, commercial and recreational shellfish, swimming areas, or other characteristics.

Phase 1: Boater Survey.

[Status: State Parks conducted Phase 1 of the education program during the summer of 1988. In cooperation with the Department of Health (element MB-6) and the Washington Public Ports Association, State Parks conducted a survey of boaters' waste disposal practices at 33 public marinas, private marinas, and publicly operated launch sites around Puget Sound. Educational materials were provided as a follow-up to those surveyed. State Parks prepared and distributed a final report on the survey results.]

Phase 2: Program Design.

[Status: State Parks designed, based in part on the results of the Phase 1 boater survey, a long-term boater education program. The program has an overall focus on boat wastes, including an emphasis on sewage disposal, marine debris, and spills of oil and other hazardous substances. The program includes active outreach to a variety of target audiences, annual training for park rangers and other appropriate groups, and mechanisms to distribute educational and interpretive materials. The program (a) encourages the use of marine sanitation devices (MSDs), pumpout facilities, dump stations, and appropriate waste disposal facilities; (b) discourages the anchoring of boats and the discharge of Types I and II MSDs within areas where commercial and recreational shellfish beds are located; and (c) provides information for boaters and marina operators about the environmentally sound use of antifouling paints, cleaning agents, petroleum products, and proper disposal of marine debris. Activities under the boater education program are coordinated with the work of other groups and agencies such as the Marine Debris Task Force, Sea Grant, the Nonpoint Technical Assistance Team (NP-6), and others.]

Phase 3: Program Implementation and Evaluation.

State Parks shall continue working with local governments and boating groups to encourage the use of state public educational materials and develop local boater environmental education programs. State Parks shall also use funds under the new boat sewage pumpout contract program to support this program. State Parks shall complete the construction of interpretive signs at marine state parks where pumpout and dumpout facilities are installed (MB-5) and shall consider installing such signs at marinas where Health conducts its water quality studies under MB-7. State Parks shall evaluate the effectiveness of the boater education program in coordination with Health and other appropriate entities. The evaluation shall include an assessment of how frequently pumpout and dumpout facilities are being used. This evaluation shall be used by a Health in its consideration of no-discharge (MB-8) and no-anchorage (MB-9) areas and by State Parks in its enforcement of MSD regulations (MB-6). State Parks representatives shall assist the Nonpoint Technical Assistance Team (NP-6) in providing information on boats and water quality to watershed management committees.

Target Date: Complete installation of interpretive signs at existing pumpout stations at state parks by June 1990. Complete first annual program evaluation by December 1990.

[Status: State Parks is actively implementing the boater education program. Working with a market research firm, State Parks developed a logo and poster for use by the education program. The agency sponsored a video contest for high schools students on boater environmental education. State Parks also conducted public workshops on the new boat sewage pumpout contract program. Interpretive signs have been installed at existing pumpout stations.]

MB-5. Construction of Pumpouts at Priority State Parks

The State Parks and Recreation Commission shall continue to install pumpout stations at selected state parks with priority given to parks located in poorly flushed bays with shellfish resources and without other nearby pumpout facilities.

Target Date: Pumpout services at up to four state parks by the summer of 1991, and at two more parks per year thereafter until the need for pumpout services is met.

[Status: State Parks worked with an advisory committee to determine the highest priority sites for pumpout installation. State Parks has installed pumpouts at Mystery Bay and Blake Island State Parks. The remaining parks designated for pumpouts by the summer of 1991 are Jarrell's Cove, Twanoh State Park, and Stuart Island.]

MB-6. Enforcement of MSD Regulations

The State Parks and Recreation Commission shall develop a comprehensive strategy to ensure compliance with federal marine sanitation device (MSD) installation and use. The strategy shall include methods to protect environmentally sensitive areas. In developing the strategy, State Parks shall consult with the U.S. Coast Guard, the Environmental Protection Agency, the Departments of Health, Ecology, Natural Resources, Fisheries, and Wildlife, sheriff's departments, local governments, and the boating community to develop various options for such a strategy. The options could suggest one or a combination of several options such as new legislation, a memorandum of understanding (MOU) with the Coast Guard, a model ordinance for local governments, or simply continuation of boater environmental education program. Public meetings shall be held in several locations in Puget Sound to take comment on the options prior to the State Parks and Recreation Commission choosing an option. If State Parks and the consulted agencies and groups determine a memorandum of understanding with the Coast Guard is a preferred strategy, State Parks shall take early action to obtain an MOU with the U.S. Coast Guard and prepare any necessary legislation to permit state inspection of recreational vessels and other uninspected vessels under 65 feet in length for marine sanitation devices (MSDs).

In developing the strategy, State Parks and the consulted agencies and groups shall consider including an inspection program coordinated with the accelerated education program (MB-4) and focused on shallow water bays and other sensitive areas. State Parks shall also consider including enforcement of no-anchorage areas and no-discharge areas if instituted under MB-8 and MB-9 below.

Target Date: Options researched by June 1992. Parks chooses option by September 1992. Submit legislation, draft MOU, or develop other programs as necessary by January 1993. Begin implementation by July 1993.

MB-7. Monitoring Program for Boating Areas

The Department of Health shall conduct an ongoing water quality monitoring program of boating areas to determine the extent of contamination by boats, to provide information for use in the boater education programs and watershed action plans (NP-2 through NP-4), and to evaluate the effectiveness of various control methods. The surveys shall include water and shellfish samples (where applicable) and boat counts. The monitoring program shall be consistent with the Puget Sound Ambient Monitoring Program.

Target Date: Ongoing.

[Status: Health selected five sites and conducted monitoring during the summer of 1988. A final report on the data from these sites has been prepared and published by Health.]

MB-8. Study of No-Discharge Areas

Following evaluation of the boater education program (MB-4) and MSD enforcement strategy (MB-6), Ecology and Health, in consultation with State Parks, shall evaluate the need for no-discharge¹³ areas; if a need is found, Ecology shall apply to EPA for their designation. Need shall be based upon the inability to achieve water and shellfish quality standards in boating areas if Type I and II MSDs are permitted. In making a determination as to whether a boating area needs a no-discharge designation, Ecology and Health shall consider the water circulation and other natural characteristics of the area, the presence of commercial and recreational shellfish and swimming areas, the results of the monitoring of boating areas (MB-7), the number of boats using an area, and, if applicable, the percent of boats with Type I and II devices found by the inspection program (MB-6).

Target Date: Study complete by July 1995; any applications to EPA made by December 1995.

MB-9. No-Anchorage Areas

The Department of Health shall provide ongoing evaluation of the results of the monitoring of boating areas and the success of the education program (MB-4) in protecting commercial and recreational shellfish beds from closures due to anchored boats. Health shall develop information for use in the boater education program on areas where anchoring is discouraged. The education program shall warn boaters of the potential for anchorage prohibitions if the education program is unsuccessful in achieving water quality and shellfish standards in boating areas.

If Health finds that the education program has been unsuccessful in protecting commercial and recreational shellfish beds from such closures, Health shall draft legislation with anchorage prohibitions to prevent any restriction in the use of commercial and recreational shellfish beds. No-anchorage areas shall be enforced as part of the MSD enforcement program (MB-6), if applicable.

Target Date: If necessary, legislation shall be submitted to the 1993 legislature.

Forest Practices

FP-1. Timber/Fish/Wildlife Project

The Authority endorses the Timber/Fish/Wildlife Project and the revisions in 1987 and 1988 to the Forest Practices Act and Regulations. The Authority supports in concept the process and proposed regulatory and programmatic chan-

¹³ "No-discharge" areas are areas where the use of Type I and Type II MSDs (treatment devices as opposed to Type III holding tanks) is prohibited. Vessels with Type I and Type II devices are permitted in no-discharge areas but may not discharge. The process of designation requires application by the governor or the Department of Ecology to the U.S. Environmental Protection Agency and a showing that sufficient pumpout facilities for all vessels exist.

ges outlined in the TFW Final Report (February 1987). In particular, the Authority supports the TFW approach of significantly increasing enforcement and monitoring of forest practices, preplanning and basin planning, interdisciplinary identification (ID) teams, data management, a comprehensive program for identifying and correcting problems with orphaned roads, riparian management zone regulations, extended forest practice application review period (extended from 15 to 30 days), reorganization and staff increases at DNR, and continuing program evaluation. The Authority will support statutory and regulatory actions, including any federal and state funding proposals, necessary to implement the TFW Agreement.

The Authority will review and comment on major milestones and documents of TFW as they relate to Puget Sound, both providing the Forest Practices Board with comments on regulatory and policy initiatives of TFW and participating in the annual TFW evaluation process.

[Status: The Authority has continued its participation in the TFW process within available resources.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW¹⁴

1. The results of the study by the Department of Health evaluating the need for revisions to WAC 248-96 for on-site septic systems and any subsequent proposed revisions (NP-10).
2. Ecology guidelines on shoreline master program requirements for marina siting and design (MB-2).
3. Cost-Share Program (NP-14).

LEGISLATION REQUIRED

1. Legislation would be required to expand boating safety enforcement powers to allow inspections of marine sanitation devices on vessels (MB-6).
2. If no-discharge areas are designated, legislation would be required to prohibit use of Type I and Type II MSDs in those areas (MB-8).
3. Legislation would be required to prohibit anchorage near commercial and recreational shellfish beds (MB-9).
4. Legislation may be required to establish a cost-sharing program (NP-14).

ESTIMATED COST

The estimated cost for the nonpoint program is approximately \$12 million in the 1991-93 biennium and about \$13 million in the 1993-95 and 1995-97 biennia. Plan cost estimates for each element for 1987 through 1997 are shown in the following tables.

¹⁴ Although the Authority will not be reviewing as major public actions the actual selection of priority watersheds or the individual action plans adopted for each priority watershed, the selection process and the plans will be reviewed by the Authority through its general oversight role, as part of the audit of the program described in NP-7, and through the reports required of state agencies and local jurisdictions described in EM-8.

Costs are for developing and implementing watershed action plans and carrying out augmented state programs for forest practices, marinas and boats, commercial dairy farms, and on-site septic systems. Most elements would likely be financed from the Centennial Clean Water Fund, federal Section 319 funds, state general fund and capital funds, and/or local government general funds. Fees (for on-site system inspections and maintenance) or rates (for watershed action plan components) are other possible funding sources.

Some of the costs for controlling nonpoint pollution would be borne by the private sector. At the local level, in watershed action plans (NP-4), there will be costs for implementing agricultural and stormwater best management practices (BMPs) and for on-site septic system pumpouts or possible replacement.

Agricultural BMP costs may be minimal, for example, sealing leaks in animal confinement areas; moderate, for example, stream fencing (approximately \$1.00/foot plus increased costs for watering livestock); or high, for example, building manure lagoons. The cost of constructing lagoons may be \$50,000 or more per farm. However, farmers implementing BMPs may be eligible for cost-sharing with government agencies.

The costs of stormwater BMPs vary widely depending upon the nature of the source and the type of BMP or good housekeeping measure needed. Two examples of stormwater BMPs are building berms and paving drum storage areas at industrial sites and constructing detention basins at residential and commercial developments. Examples of costs for stormwater BMPs are given in the Stormwater and CSOs Program.

On-site septic systems can be pumped out for about \$120, but if they need to be repaired or replaced, the costs would be much higher. For example, a new drainfield would cost \$1,000 to \$2,000, while costs for alternative systems range from \$3,000 to \$10,000. Low-interest loans from the state Department of Community Development may be available in some cases for sewerage areas with high numbers of on-site system failures.

There will also be private sector costs for state-level programs. There will be costs related to the Dairy Waste Management Plan (NP-13) for implementing BMPs to minimize pollution from agricultural practices, as mentioned above for the watershed action plans; they may be eligible for cost-sharing.

The nonpoint program includes two new elements that address pesticides. These two elements, NP-16, pesticide use surveys, and NP-17, a program for regional pest management education and research, would cost approximately \$0.7 million for the 1991-93 biennium. The costs would increase to approximately \$0.8 million and then \$1 million over the next two biennia.

In the marinas and boats program, State Parks estimates an average cost of \$100,000 for pumpout facilities at state parks. Although some boaters may have to spend money installing marine sanitation devices because of the state enforcement program (MB-6) (\$200 to \$1,000 depending on type of MSD and installation costs), the requirement for MSDs already exists in federal regulations. Similar costs would be borne by boaters with Type I or II MSDs who might wish to use their toilets legally in no discharge areas (MB-8) and therefore might choose to replace their MSDs with holding tanks (replacement would not be required by law). Boat repair facilities may also incur additional costs for runoff controls, and marinas may incur costs for education and sewage treatment facilities resulting from the revised shoreline master program guidelines (MB-2). The new boat sewage pumpout contract program provides an important

new source of funding for the installation of sewage pumpout stations throughout the Sound.

For forest practices, there is a potential for private sector costs from actions taken through TFW.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Nonpoint Source Pollution

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
NP-1 Selection of Priority Watersheds	\$338,978	\$0	\$0	\$60,000	\$0
NP-2 Guidelines for Watershed Plans	\$256,190	\$145,112	\$63,971	\$0	\$0
NP-3 Watershed Management Committees	\$2,820,266	\$1,862,666	\$2,550,000	\$2,550,000	\$2,550,000
NP-4 Plan Adoption and Implementation	\$2,601,155	\$3,186,616	\$2,790,000	\$2,790,000	\$2,790,000
NP-5 Program Funding and Incentives	\$0	\$554,600	\$560,000	\$560,000	\$560,000
NP-6 Technical Assistance for Plans	\$517,861	\$850,506	\$1,266,749	\$1,231,302	\$1,231,302
NP-7 Program Management	\$302,980	\$303,424	\$521,086	\$521,086	\$521,086
NP-8 Education Programs	\$44,800	\$0	\$0	\$0	\$0
NP-9 Prevention	\$1,038,794	\$11,250	\$0	\$0	\$0
NP-10 On-site Regulations and Programs	\$179,199	\$450,000	\$576,242	\$390,000	\$390,000
NP-12 Certification of On-site Prof.	\$0	\$0	\$148,920	\$142,420	\$142,420
NP-13 Dairy Waste Management Plan	\$2,376,122	\$3,114,808	\$1,426,168	\$1,426,168	\$1,426,168
NP-14 Cost-Sharing Program	\$0	\$3,500	\$98,795	\$127,832	\$0
NP-15 Larger/Alternative On-Site Systems	\$0	\$0	\$515,494	\$492,994	\$492,994
NP-16 Pesticide Usage Surveys	\$0	\$0	\$200,804	\$180,804	\$0
NP-17 Pest Management Program	\$0	\$0	\$508,800	\$706,505	\$1,049,208
MB-2 SMP Amendments for Marinas	\$0	\$260,000	\$120,926	\$14,308	\$14,308
MB-3 Model Ordinance for Sewage in Marinas	\$20,247	\$36,000	\$40,285	\$0	\$0
MB-4 Boaters Task Force	\$281,789	\$90,176	\$185,796	\$185,796	\$185,796
MB-5 Construction of Pumpouts at Priority Parks	\$662,000	\$562,144	\$386,000	\$356,000	\$370,000
MB-6 Enforcement of MSD Regulations	\$40,000	\$3,750	\$56,198	\$1,348,971	\$1,256,846
MB-7 Monitoring of Boating Areas	\$79,642	\$134,000	\$134,510	\$134,510	\$134,510
MB-8 Study of No-Discharge Areas	\$0	\$0	\$0	\$72,606	\$36,304
MB-9 No-Anchorage Areas	\$0	\$0	\$13,148	\$0	\$0
TOTALS	\$11,560,023	\$11,568,552	\$12,163,892	\$13,291,302	\$13,150,942

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
State Capital Funds	\$549,000	\$414,982	\$350,000	\$300,000	\$300,000
Centennial Clean Water Account	\$6,153,855	\$6,289,784	\$5,277,500	\$5,277,500	\$5,277,500
Federal Funding Sources	\$0	\$262,812	\$0	\$0	\$0
Local Funding Sources	\$2,774,370	\$2,303,464	\$1,555,500	\$1,547,900	\$1,487,900
Motor Vehicle Fund	\$0	\$26,000	\$0	\$0	\$0
Permit Fee	\$0	\$190,042	\$0	\$0	\$0
State General Fund	\$2,016,132	\$2,014,802	\$4,076,288	\$5,083,593	\$4,841,334
Toxics Accounts	\$0	\$0	\$709,604	\$887,309	\$1,049,208
Tribal Funding Sources	\$66,666	\$66,666	\$195,000	\$195,000	\$195,000
TOTALS	\$11,560,023	\$11,568,552	\$12,163,892	\$13,291,302	\$13,150,942

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Nonpoint Source Pollution

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$19,247	\$71,000	\$195,000	\$195,000	\$195,000
Attorney General	\$0	\$0	\$0	\$21,000	\$0
Conservation Commission	\$723,186	\$35,800	\$110,500	\$110,500	\$65,000
Conservation Districts	\$0	\$538,400	\$1,520,000	\$1,520,000	\$1,520,000
Cooperative Extension	\$0	\$100,000	\$635,408	\$813,113	\$975,012
Department of Natural Resources	\$23,498	\$0	\$52,013	\$58,326	\$58,326
Department of Health	\$363,053	\$794,000	\$1,158,265	\$928,778	\$917,824
WA Department of Transportation	\$0	\$26,000	\$65,000	\$65,000	\$65,000
Department of Ecology	\$846,070	\$1,146,672	\$1,479,059	\$1,439,280	\$1,374,892
Local Governments	\$8,159,825	\$7,754,848	\$5,028,000	\$5,020,400	\$4,960,400
Parks and Recreation Commission	\$938,795	\$709,306	\$648,792	\$1,873,963	\$1,784,798
Puget Sound Water Quality Authority	\$172,689	\$101,346	\$127,437	\$93,436	\$82,184
Tribal Governments	\$266,666	\$266,666	\$780,000	\$780,000	\$780,000
Washington Conservation Corps	\$0	\$0	\$90,000	\$90,000	\$90,000
Department of Fisheries	\$24,996	\$0	\$212,108	\$219,808	\$219,808
Department of Wildlife	\$21,998	\$24,514	\$62,310	\$62,698	\$62,698
TOTALS	\$11,560,023	\$11,568,552	\$12,163,892	\$13,291,302	\$13,150,942

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

SHELLFISH PROTECTION PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION

Importance of the Shellfish Resource



Puget Sound is one of the most productive shellfish growing areas in the country. Recent Department of Fisheries data indicate that the commercial harvest of oysters, clams, and mussels in 1989 was over 11.3 million pounds, with an estimated wholesale value of \$26 million. Existing commercial shellfish operations represent only a fraction of the potential production of Puget Sound. The economic losses attributable to prohibited, restricted, or conditionally approved shellfish beds are estimated to be over \$3 million annually. In addition, the Sound's shellfish resources are becoming increasingly valuable and sought-after as harvest is restricted at more and more East Coast shellfish areas.

The Department of Fisheries estimates that over one million recreational clamming trips are made to Puget Sound each year, yielding over 3.3 million pounds of clams for an approximate retail value of \$11.2 million. Fisheries also reports that in 1986 approximately 6,600 gallons of oysters were harvested in Hood Canal for noncommercial consumption, a potential retail value of approximately \$250,000.

The value of the shellfish resource, however, extends far beyond strictly economic benefits. There are few other places where the tie between people and their natural surroundings is as close as on Puget Sound. An important part of this tie is the use of the Sound's shellfish resource—for years people have depended on shellfish for food or have enjoyed shellfish harvesting. For numbers of people, including many who do not themselves harvest shellfish, these and other living resources of the Sound represent historical and cultural values integral to the quality of life of the region.

Causes of Contamination

Some commercial shellfish beds in Puget Sound were closed to harvest as early as the 1950s. These early closures occurred mainly in urbanized areas due to the beds' proximity to sewage treatment plants and other urban sources of pollution. A significant change in this pattern has occurred since 1981. Most restrictions placed on harvesting shellfish now occur in rural, not urban bays, due to the cumulative impacts of nonpoint pollution. Animal-keeping practices, failing on-site septic systems, stormwater, sewage treatment plants, marinas, and boats are all sources of fecal coliform bacteria and have been implicated in recent harvest restrictions at commercial shellfish beds. It has recently been reported that resident seal populations are also contributing to high fecal coliform counts in some bays and inlets.

Department of Health records indicated that some 30 percent of the shellfish growing areas that were once certified for commercial harvest in Puget Sound have, over the years, become subject to harvest restrictions due to pollution. This is a significant reduction in the ability of Puget Sound to produce healthful shellfish for commercial harvest. Over half of the reduction has occurred since 1986. Between 1986 and 1990, nine beds totaling 13,940 acres have become subject to harvest restrictions due to nonpoint source pollution.¹

In addition, preliminary results of monitoring of 73 beaches under the recreational shellfish program (SF-4) show 18 recreational sites that do not meet fecal coliform standards in Chapter 248.52 WAC as of January 1990.

The increasing rate of shellfish bed restrictions is likely to continue and perhaps accelerate as the Puget Sound region expands in population. Nearly all the restrictions in the last 10 years have been caused by nonpoint pollution, and as more people move into the area, the threat of substantial increases in nonpoint pollution becomes a direct threat to the shellfish harvest.

Ecology and Health estimate, as of February 1990, that of the 77 commercial shellfish beds in Puget Sound, 37 are minimally threatened by pollution, 24 are threatened and in need of protection activities, and 16 are contaminated and require restoration projects.

There is limited information on toxic contamination of commercial and recreational shellfish in Puget Sound. The Department of Health study at recreational beaches (SF-3) includes testing for some toxicants as part of the Puget Sound Ambient Monitoring Program.

PROGRAM STATUS

The two major elements of the shellfish protection program are the protection and restoration of commercial shellfish beds (SF-2) and the recreational shellfish program (SF-4). Both of these elements are well into the implementation phase. Seven early action shellfish watershed programs are in place around the Sound as part of the nonpoint source pollution program (SF-2). These watershed plans are in various stages of review at the local level, and Ecology will be approving them on an ongoing basis. Ecology and other state and federal agencies provide technical assistance to these local programs, and the Department of Health coordinates its monitoring of shellfish beds with watershed management committees. Health continues to conduct additional sampling under the toxicant testing program to establish baseline and trend information (SF-3).

Under the recreational shellfish program (SF-4), Health has inventoried almost 150 recreational shellfish beds, established a schedule for monitoring, and initiated sampling at over 70 sites. The State Board of Health has adopted regulations that govern the recreational harvest of shellfish. Ecology, in coordination with the Department of Health, is in the final stages of preparing a Recreational Shellfish Plan, which will undergo extensive public review. The EPA-funded recreational shellfish protection project at Penrose State Park is well underway. Preliminary results from Health monitoring of recreational shellfish areas show

¹ Figures are compiled from Department of Health data provided to the Authority in March 1990 and from the Second Annual Inventory of Commercial and Recreational Shellfish Areas in Puget Sound (SF-5).

that harvesting at a significant number of these beaches may have to be restricted due to bacterial pollution. There may be a need, therefore, for a higher number of recreational shellfish restoration projects than anticipated in the 1987 and 1989 plans.

Health published the third annual inventory of shellfish resources (SF-5) in June 1990. It has been distributed to local health agencies, Ecology, other state agencies, and watershed management committees. The Ecology funding assessment (SF-6) was presented to the Authority in January 1990 in preliminary form. Efforts to gain legislative approval will be ongoing.

Many public involvement and education activities have taken place (SF-7). Ecology included education and involvement in its contract requirements for the seven early action shellfish watersheds. Ecology also developed a shellfish and watershed display for the early action watersheds and has prepared a Shellfish Education Strategy to guide its activities under this element. The Department of Fisheries expanded and reprinted its shellfish booklet. Health public information staff coordinate the agency's many educational activities related to the Puget Sound plan. Health and Ecology are coordinating with other state agencies and citizen groups on widely publicizing shellfish contamination problems and cleanup needs during the week of the first low tide of the summer season.

PROGRAM GOAL

To protect water quality and prevent contamination of commercial and recreational shellfish beds so that shellfish are safe for human consumption; to reduce contamination of shellfish beds sufficiently to allow reopening of at least one contaminated shellfish bed each year; and to prevent human consumption of shellfish from contaminated beds until such time as the contamination is corrected.

STRATEGY

The strategy for achieving this goal is to (1) adopt shellfish policies that will ensure that pollution source control programs protect shellfish; (2) respond to existing and potential shellfish contamination with aggressive restoration and protection programs; (3) monitor commercial and recreational shellfish areas for toxic contaminants and indicators of pathogenic organisms; and (4) increase public involvement and education in shellfish protection.

PROGRAM ELEMENTS

SF-1. Shellfish Protection and Restoration Policy

In developing the programs for Nonpoint Source Pollution (including local watershed action plans), Stormwater and Combined Sewer Overflows, and Municipal and Industrial Discharges, state and local agencies shall ensure that the programs meet these objectives:

- a. Protection of shellfish beds from contamination and from reclassification to a more restrictive status;
- b. Reduction of contamination of commercial beds sufficient to allow lifting of harvest restrictions; and
- c. Reduction of contamination of recreational shellfish beds.

Target Date: Ongoing.

**SF-2. Restoration
and Protection of
Commercial
Shellfish Beds**

[Completed portions of this element have been deleted.]

Ecology, Health, DNR, local and tribal governments, in cooperation with the Authority, shall continue and expand their existing shellfish protection and restoration programs. Ecology grants to local governments for shellfish protection and restoration shall be coordinated with the nonpoint program. Ecology shall provide policy guidance, financial aid, grants administration, and technical assistance, in coordination with the Nonpoint Technical Assistance team (NP-6), to local and tribal governments, conservation districts, or other entities carrying out shellfish projects under the nonpoint program.

Health shall continue to (a) expand and coordinate its investigations and monitoring program with Ecology and local and tribal governments; (b) retest sites where harvest restrictions apply; (c) monitor sites being addressed by local shellfish protection projects; and (d) develop assessments of pollution sources, recommend corrective actions to local governments and/or state agencies, and provide technical assistance. Information on monitoring results and source investigations shall be transmitted as soon as available to Ecology and the appropriate local and tribal governments, local health agencies, and agencies.

Ecology and Health, in cooperation with DNR, local governments, and tribal governments, shall develop a shellfish protection and closure prevention strategy to be implemented primarily by local government. This strategy shall address watersheds in the Puget Sound basin that are not scheduled for funding assistance for at least two years under the nonpoint watershed program and where there are significant commercial shellfish areas that currently meet state water quality standards but are threatened with contamination from surrounding land uses or projected land uses. State funding and technical assistance shall be provided to local and/or tribal governments to develop and implement programs aimed at preventing any downgrade in the classification of these threatened shellfish growing areas.

As part of this strategy, Health shall provide local and tribal governments and the public in the Puget Sound basin with water quality monitoring data, trends, and summary information on shellfish growing areas in their jurisdictions. In cooperation with local and/or tribal governments, Health shall determine which shellfish areas are threatened and identify which areas require shellfish protection programs.

The shellfish protection and closure prevention strategy shall assist local governments in establishing shellfish protection programs. These local programs shall include, at minimum: (a) a review of the adequacy of local land use and other ordinances and programs (such as water quality source control, technical assistance, or education) to prevent contamination of shellfish beds; (b) an assessment of any necessary changes to local land use and other ordinances and programs; (c) identification of a process and schedule for implementing the required changes; (d) identification of problem farms, on-site septic system failures, stormwater outfalls, and other bacterial sources and development of a program to correct these sources; and (e) a long-term ongoing evaluation process to determine the effectiveness of the changes and to identify any additional necessary changes to land use and other ordinances and programs.

Health, DNR, and Ecology shall provide technical assistance and other necessary resources to local and tribal governments for the development of shellfish

protection programs. In areas with no local or tribal government participation, Health, DNR, and Ecology shall take action and target state resources to prevent shellfish bed contamination, including public education, technical assistance, and enforcement.

The Authority shall review during the plan revision process the success of state and local agencies in controlling identified and potential sources of shellfish contamination.

Target Date: Health provides water quality information to local and tribal governments by March 1, 1991. Health and Ecology, in cooperation with local and tribal governments, develop the shellfish protection strategy and funding priorities by July 1, 1991. State assistance for local or tribal government programs begins by September 1, 1991. Health and Ecology provide a written progress report on the protection strategy to the Authority annually beginning December 1, 1991.

[Status: This element originally called for expansion and implementation of the shellfish protection program, to be implemented primarily under the nonpoint watershed planning program. The first Ecology shellfish watersheds have been incorporated into the nonpoint early action watershed program. Health has continued to expand and coordinate its monitoring program, including restoration monitoring and planning.]

SF-3. Testing Selected Shellfish Beds for Toxicants

The Department of Health shall establish an ongoing program, consistent with the Puget Sound Ambient Monitoring Program and including the use of Puget Sound Protocols and Guidelines, to test for toxicants at commercial and recreational areas where recent studies have found toxicants to occur. The results of the tests shall be used to establish baseline and trend information on toxicants in shellfish around the Sound. Beds where toxicants exceed existing FDA action levels, or other accepted standards as developed, such as risk assessment methodology based on the Water Quality Criteria document, shall be closed and routinely reevaluated. The Authority shall request FDA to reconsider, in consultation with EPA and NOAA, the need to establish standards and require testing for toxicants not covered by existing FDA action levels.

Target Date: Ongoing.

[Status: This element has been incorporated into the Puget Sound Ambient Monitoring Program. Results continue to show only very low levels of toxicants at a limited number of sites (the test is for the priority pollutants). Additional sites will be tested if funding is increased.]

SF-4. Recreational Shellfish Program

[Completed portions of this element have been deleted.]

Representatives from Ecology, Health, Fisheries, DNR, State Parks, tribal governments, a public interest group, and local health departments (with Health and Ecology as co-leads) shall comprise a committee to assist Ecology and Health in implementing the Ecology-Health Recreational Shellfish Plan and coordinating with other related efforts such as the tribal/state shellfish caucus.

Health shall evaluate the effectiveness of the rules adopted by the state Board of Health governing the recreational harvest of shellfish and submit the evaluation to the Authority. Health shall assist local health agencies in developing and im-

plementing the local recreational shellfish plans required under the recreational shellfish regulation adopted by the State Board of Health. Health shall distribute funds for local plan development and implementation based on the criteria in Chapter 248.52 WAC and Ecology's Recreational Shellfish Plan.

Health and Ecology shall implement protection and restoration activities described in SF-2 and SF-8 where necessary for recreational shellfish.

Target Dates: Submit evaluation of rules by January 1, 1991. Begin distributing funds to local governments by January 1, 1992.

[Status: Health and Ecology submitted a joint scope of work to the Authority. Ecology, with the assistance of the Recreational Shellfish Program Committee, has completed a draft plan to guide this program and has drafted recommendations for the restoration and protection projects grants. Health has inventoried recreational shellfish beaches and begun monitoring. The State Board of Health adopted regulations governing the recreational harvest of shellfish in September 1989. Health is currently working with all 12 Puget Sound counties to prepare the recreational shellfish plans required in the regulation adopted by the State Board of Health. EPA has funded a recreational shellfish restoration project at Penrose Point State Park, and Ecology and Health are assisting in the project.]

SF-5. Annual Inventory and Information Management

The Department of Health shall annually publish and distribute to local health departments, Ecology and other state resource agencies, the PSEP Management Committee, tribal governments, and local watershed management committees (see NP-3) an inventory of all shellfish beds, including sites in the Puget Sound basin where recreational and commercial shellfish beds have been found to be contaminated, indicating the types of contamination tested for and the types found. Health, in coordination with the Puget Sound Ambient Monitoring Program, shall prepare a guide to all existing data bases and information sources on the shellfish resource. Health shall consult with Ecology, the Departments of Fisheries and Natural Resources, the State Parks and Recreation Commission, tribal governments, and local health agencies and shall update and distribute the guide annually to watershed management committees, recreational shellfish restoration projects, and the entities named above. Activities under this element shall be coordinated with the Recreational Shellfish Program (element SF-4).

Target Date: Distribute first inventory by November 1, 1987. Health distributes first shellfish information guide by July 1, 1990.

[Status: The first annual inventory was completed and distributed in July 1988, the second inventory was distributed in March 1989, and the third inventory was distributed in June 1990.]

SF-6. Funding Sources Assessment

Ecology shall assess the adequacy of existing funding mechanisms for the shellfish protection programs, identify new sources, and develop and implement a strategy for securing funds. Ecology shall consult with its Shellfish Protection Advisory Committee and with the Authority and the Departments of Health, Fisheries, and Natural Resources in the development of this program. Revenues from the funding strategy shall be used for implementation, primarily by local governments, of Puget Sound plan elements pertaining to shellfish protection and nonpoint source pollution control.

Target Date: Submit assessment to the Authority by May 1, 1989. Implement strategy by January 1, 1991.

[Status: Ecology presented the draft assessment to the Authority in October 1989 and the draft funding strategy in January 1990. Responsibilities for this element are being carried out under element EM-7 in the Estuary Management Program.]

SF-7. Public Involvement and Education

Ecology, in consultation with the Recreational Shellfish Program Committee, the Departments of Health, Fisheries, and Natural Resource, and University of Washington Sea Grant specialists shall implement its Shellfish Education Strategy, a program for public involvement in and education on the protection of the shellfish resources of Puget Sound.

The program shall implement improved mechanisms for disseminating information among agencies and to the public on shellfish issues, especially beach closures and public health risks. The program shall also include procedures for coordinating workshops and the updating and distribution of agency shellfish publications, citizen involvement in shellfish protection projects, and the prevention of shellfish contamination. Ecology and Health shall jointly organize an annual low tide event in early summer that publicizes concerns about shellfish and water quality.

Health and local health departments shall implement a program of posting, press releases, and other techniques to prevent harvesting of contaminated shellfish and to inform the public, including shellfish growers, of commercial and recreational shellfish contamination and closures and of programs addressing these issues.

The Department of Fisheries shall establish a work group that includes agencies, boaters, shellfish growers, and tribal governments to develop an interpretive program at an appropriate location in Puget Sound (element EPI-3.1).

Ecology, Health, and other agencies shall include, as appropriate, information about shellfish and shellfish protection in other educational programs developed under the Puget Sound plan. Education shall be a required element of all local programs under SF-2 and SF-4 and shall be included, as appropriate, in nonpoint program watershed action plans, nonpoint technical assistance team activities (NP-6), and the boater education program (MB-4).

Target Date: Ecology submits progress report to the Authority by November 1, 1989. Fisheries begins interpretive program by May 1, 1992.

[Status: Ecology has included education and involvement in its contract requirements for the seven early action shellfish watersheds. Ecology also has developed a shellfish and watershed display for the early action watersheds and has prepared a Shellfish Education Strategy. The Department of Fisheries expanded and reprinted its shellfish booklet. Health public information staff coordinate the agency's many Puget Sound plan public education activities, including booths at many summer fairs and public service announcements and television specials on shellfish protection.]

SF-8. Shellfish Closure Response Strategy

The Departments of Ecology and Health shall develop an interagency Memorandum of Agreement to govern their responses to downgrades in classification of commercial and recreational shellfish beds. This agreement shall specify the general roles, responsibilities, funding source(s), and schedule for

the two agencies to develop a response strategy for correcting contamination of each shellfish bed that is downgraded after signing of the memorandum. Under the agreement, Health shall have the responsibility to initiate the development of a strategy within 30 days of the downgrading of a commercial or recreational shellfish bed. Health and Ecology shall then have 60 days to jointly develop a response strategy, in consultation with appropriate state agencies and local and tribal governments, to upgrade the classification of the shellfish bed. Where the affected shellfish bed is on property managed by State Parks or DNR, they shall be asked to participate in the development of the strategy. At a minimum, each joint response strategy shall:

- a. Specify the detailed tasks to be accomplished by each state agency, local and/or tribal government and a mutually acceptable schedule for each task;
- b. Include a public involvement and notification strategy;
- c. Involve all relevant parties in the development and implementation of a strategy to upgrade the classification of the shellfish bed, including shellfish growers, watershed management committees, shellfish protection area projects, and all other affected and interested parties;
- d. Provide state technical and funding assistance to local government;
- e. Provide a detailed compliance schedule for those actions that need to be undertaken by government or the private sector to achieve upgraded classification of the shellfish area;
- f. Provide for enforcement by state and/or local government where the compliance schedule is not being met, including the imposition of enforcement orders, building moratoria, revised land use ordinances, repair of on-site septic systems, and other necessary measures under state authorities, such as Chapters 90.49 and 43.20 RCW and/or local police powers.

Ecology, Health, and the Authority shall seek to fund implementation of each Response Strategy with monies from the Centennial Clean Water Fund, the Puget Sound Estuary Program, or other sources.

Ecology, the Authority, EPA, and Health, in consultation with the Shellfish Advisory Committee and others, shall select a shellfish area for an action demonstration restoration project. Funding shall be provided to undertake all necessary activities to restore the shellfish bed within two years.

Target Date: Ecology and Health sign MOA by July 1, 1991. Response strategies prepared on an ongoing basis. The Authority obtains funding support for action demonstration project by November 1, 1991.

[Status: *This is a new element.*]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Restoration/protection program for commercial shellfish beds (SF-2).
2. Department of Health program for testing of toxicants in selected areas (SF-3).
3. Recreational shellfish program and regulations (SF-4).
4. Funding sources assessment (SF-6).

5. Public involvement and education program (SF-7).
6. Health and Ecology MOA for Shellfish Closure Response (SF-8).

**LEGISLATION
REQUIRED**

Ecology may draft legislation to implement SF-6/EM-7, Shellfish Funding Strategy.

ESTIMATED COST

The shellfish program is estimated to cost approximately \$7.1 million in the 1991-93 biennium. It is an increase of approximately \$3.9 million over the actual funding of the 1989 Shellfish Protection Program (approximately \$3.2 million).

New costs are incurred under SF-2, SF-4, and SF-8. Increased costs for SF-2 and SF-4 include additional staff at Health and Ecology to implement the proposed protection program and pass-through funds for Health and the Authority to disburse for protection projects. Finally, costs for the new element, SF-8, include staff at Ecology and Health and grant funds for local response strategies. Additional funding will be sought, perhaps from federal sources, for the SF-8 action demonstration restoration project.

Private sector costs resulting from shellfish restoration and protection projects would primarily involve repairs of failed on-site septic systems or implementation of farm animal waste control programs. These costs are discussed in the nonpoint program.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Shellfish Protection

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
SF-2 Restoration and Protection of Commercial Beds	\$373,522	\$510,000	\$2,449,682	\$2,449,594	\$2,424,306
SF-3 Toxicant Testing of Selected Beds	\$14,126	\$0	\$0	\$0	\$0
SF-4 Recreational Shellfish Program	\$640,263	\$1,676,894	\$2,840,009	\$2,825,822	\$2,825,822
SF-5 Annual Inventory and Information Management	\$32,776	\$120,000	\$113,100	\$108,600	\$108,600
SF-6 Funding Sources Assessment	\$33,441	\$154,240	\$0	\$0	\$0
SF-7 Public Involvement and Education	\$413,014	\$698,944	\$829,610	\$829,610	\$829,610
SF-8 Shellfish Closure Response Strategy	\$0	\$0	\$1,016,825	\$1,002,638	\$1,002,638
TOTALS	\$1,507,142	\$3,160,078	\$7,249,226	\$7,216,264	\$7,190,976

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Natural Resources	\$10,998	\$0	\$79,401	\$98,500	\$98,500
Department of Health	\$797,339	\$1,200,000	\$2,888,514	\$2,864,014	\$2,864,014
Department of Ecology	\$199,558	\$365,996	\$548,355	\$520,794	\$520,794
EPA Region 10	\$0	\$0	\$400,000	\$400,000	\$400,000
Local Governments	\$459,254	\$1,530,634	\$1,363,200	\$1,363,200	\$1,363,200
Parks and Recreation Commission	\$10,998	\$0	\$0	\$0	\$0
Puget Sound Water Quality Authority	\$10,998	\$63,448	\$1,795,020	\$1,795,020	\$1,769,732
Department of Fisheries	\$17,997	\$0	\$174,736	\$174,736	\$174,736
TOTALS	\$1,507,142	\$3,160,078	\$7,249,226	\$7,216,264	\$7,190,976

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$1,750,000	\$1,750,000	\$1,750,000
Centennial Clean Water Account	\$397,602	\$1,250,000	\$960,000	\$960,000	\$960,000
Federal Funding Sources	\$0	\$203,542	\$400,000	\$400,000	\$400,000
Local Funding Sources	\$61,652	\$280,634	\$403,200	\$403,200	\$403,200
State General Fund	\$1,047,888	\$1,425,902	\$3,736,026	\$3,703,064	\$3,677,776
TOTALS	\$1,507,142	\$3,160,078	\$7,249,226	\$7,216,264	\$7,190,976

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

WETLANDS PROTECTION PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION

The Importance of Wetlands



Wetlands are an economically, biologically, and physically valuable resource. They are the most biologically productive ecosystems in nature, anchoring the estuarine and freshwater food chains through photosynthesis and the production of innumerable small organisms upon which larger creatures depend.

For a vast diversity of species, including birds, fish, reptiles, invertebrates, and mammals, wetlands¹ are essential habitat for feeding, nesting, cover, and breeding. At least one-third of our state's threatened and endangered species require wetlands for their survival. The state Department of Wildlife lists over 175 wildlife species that use wetlands for primary feeding habitat and 140 species that use them for primary breeding habitat. Wetlands are critical to the survival of shellfish, salmonids, and other marine and freshwater species. The annual retail value of these fisheries to the Puget Sound region is over \$202 million.²

Other physical and economic values of wetlands include the slowing and storage of floodwaters and reduction of shoreline erosion from wind and tidal action. These functions may eliminate the need in some cases for costly engineered flood and erosion control measures such as dredging, diking, and construction of detention facilities. For flood control, the city of Bellevue has found that construction of stormwater control facilities would be 130 percent more expensive than maintenance of natural wetland systems.³

Wetlands function naturally to recharge groundwater supplies and to improve water quality. Wetlands filter out sediments, use excess nutrients, and break

1 Except for local government wetland protection programs the U.S. Fish and Wildlife Service definition has been adopted: Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. Wetlands have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season each year. Please refer to element W-4 for the definition of regulated wetlands as it relates to local government wetlands protection programs.

2 PSWQA, State of the Sound 1988 Report, p.47.

3 Washington Environment 2010 Project. Department of Ecology, Wetlands Loss and Degradation Action Strategy and Analysis Report Draft, March 13, 1990.

down some toxic chemicals (although it is not yet clear how toxicants and higher flows from stormwater discharges into wetlands may affect their functioning). As long ago as 1977, the Environmental Protection Agency estimated the savings in water supply and water quality in one acre of wetland to be worth \$31,656.⁴ Recent mitigation costs to replace estuarine wetlands in various areas of Washington were \$16,000 per acre for intertidal area construction in Tacoma, \$40,000 per acre for eel grass beds in Blaine, \$125,000 per acre for preliminary experiments in Lummi Bay, and \$316,000 per acre for fish mitigation costs in Grays Harbor. Monitoring of mitigation projects adds about \$10,000 per acre per year.⁵

Wetlands also provide quality-of-life benefits. Wetlands are scenic destinations for hiking, boating, photography, and nature appreciation. It is difficult to derive economic values for these benefits. Individuals visiting wetlands often gauge the value of these benefits in more qualitative terms, such as personal fulfillment and renewal. Finally, wetlands furnish us with important educational and research opportunities.

The Loss of Wetlands

More than half of the wetlands along the coasts and riverbanks of Puget Sound have been destroyed by human activity. In the Skagit Valley, for example, 90 to 95 percent of the wetlands have been lost, primarily to agriculture. Commercial development in areas such as the Green/Duwamish and Puyallup river basins has eliminated over 95 percent of the original wetlands. Sensitive, rare, and important wetland types, including herring and smelt spawning beds and salt marshes, have been lost or are threatened. In some cases, such as inland freshwater wetlands, the nature and extent of wetland loss is unknown because wetland inventories are lacking. Ecology estimates that between 716 and 2,034 acres of wetland are lost each year in Washington state.⁶

Some of the original causes of wetland loss, such as diking wetlands to create pastureland, no longer pose the major threat to wetlands. Wetlands, especially marine shorelines, remain choice locations for certain types of industrial, commercial, and residential use. Incremental loss of some estuarine wetlands continues to occur from port industrial development and to an unquantified extent from small projects such as bulkheading. Cumulative losses can represent significant percentages of some habitat types in certain areas.

The greatest threat to wetlands is the rapid rate of population growth in the Puget Sound basin, an estimated 40 percent increase by 2010.⁷ This rapid growth in the region's population places enormous pressure on the remaining wetlands resource base. In some watersheds, the only developable land left is not land at all, it is wetland. For example, development interests estimate that

4 Ibid.

5 Ibid.

6 Ibid.

7 Washington Office of Financial Management, 1989 population trends for Washington State.

Laws and Programs for Protecting Wetlands

good
summary
of the
wetlands

between 70 and 90 percent of the developable land in King County's Green River valley may fall under wetlands regulations.⁸

A variety of federal, state, and local laws are now in effect that help control wetland losses. The scope of these laws is limited, however, and programs derived from them are often inadequately funded and not well coordinated among different levels of government. The decision to protect wetlands is discretionary rather than mandatory under many of these laws. A wetlands protection bill failed in the 1990 legislature. Recent Executive Orders pertaining to wetlands protection apply directly only to state executive agencies.

In April 1990 Governor Booth Gardner issued an Executive Order (90-04) that directs all state agencies to rigorously enforce their existing authorities to assure wetlands protection. The Department of Ecology is directed to develop statewide policies and standards for a wetlands rating system, mitigation, buffers, restoration, and enhancement. These policies and standards are to be adopted by state agencies as part of their State Environmental Policy Act (SEPA) policies. Ecology is also directed to condition, deny, or appeal shoreline permits, to the extent legally permissible, to assure wetlands protection. The Departments of Fisheries and Wildlife are to condition or deny hydraulics permits to protect fish by assuring wetlands protection. The Puget Sound Water Quality Authority is directed to continue its efforts to ensure full implementation of the wetlands elements of the Puget Sound plan. All state agencies, within available resources, are directed to use their authorities to assist in implementing applicable portions of the Puget Sound wetlands program.

Wetlands are
not protected
by the state
wetlands act
if they are
not in a
wetland area.

The Growth Management Act, Chapter 17, Laws of 1990, 1st ex. sess., enacted by the 1990 Washington State Legislature (SHB 2929) requires local governments to adopt regulations to protect wetlands as critical areas, but it does not require that these regulations meet state standards or that local governments prepare comprehensive wetlands protection programs.

A study by the Department of Ecology shows that the State Environmental Policy Act (SEPA) provides inadequate protection to isolated wetlands and fails to satisfactorily identify wetland areas and impacts.⁹ This study also provides evidence of a general lack of knowledge about wetlands at the local level. Another study, by the Region 10 Office of the Environmental Protection Agency, shows that most agency efforts to ensure that wetland losses are compensated by enhancing existing wetlands or creating new ones have not been successful at replacing the functions and values of the eliminated wetland.¹⁰

Most of the applicable laws exclude small water bodies and wetlands from regulation or contain various exemptions. Minor development projects and ac-

⁸ Letter to Governor Booth Gardner from National Association of Industrial and Office Parks, Washington Association of Realtors, Seattle Master Builders Association, and Associated General Contractors of Washington, November 30, 1988.

⁹ Hull, S.W. and J.S. MacIvor. 1987. State environmental policy act wetlands evaluation project. Washington Department of Ecology, Wetlands Section, as cited in PSWQA, State of the Sound 1988 Report.

¹⁰ U.S. Environmental Protection Agency. 1987. Implications of wetland mitigation practices pursuant to Section 404 permitting activities in Washington state. Region 10, unpublished report, as cited in PSWQA, State of the Sound 1988 Report.

tivities, for example, are typically exempted. Actions adjacent to wetlands but lying outside a regulatory boundary, such as the 200-foot limit of the Shoreline Management Act, can also adversely affect wetlands. In the past, no program has focused exclusively on either the protection of wetlands on state-owned lands or the restoration of degraded wetlands.

The cumulative effect of these exemptions, programmatic gaps, and limitations is that wetlands throughout the Puget Sound basin continue to be degraded and lost.

PROGRAM STATUS

The Puget Sound wetlands protection program has been ongoing since 1987 when the program was included in the first plan prepared by the Puget Sound Water Quality Authority. The program includes preservation (through fee-simple or other type of acquisition of property rights), enhanced state and local regulations, protection for wetlands on state-owned lands, education, and restoration. By October 1988 Ecology had formed technical review and citizen advisory committees for both the preservation and the enhanced regulatory programs. Under Criteria Development and Program Planning (W-1), Ecology submitted a report to the Authority on criteria and techniques for preservation in September 1988. Ecology widely distributed a nomination questionnaire requesting groups and individuals to identify wetlands to be preserved (W-2). Almost 100 wetlands were nominated, and Ecology conducted field visits to many of these sites in 1989. A draft working list of wetlands to be preserved was jointly submitted by Ecology and the Department of Natural Resources in November 1988, consisting of sites from the Puget Trough Coastal Wetlands Report. The final list of important wetlands is due to be submitted to the Authority in December 1990.

As an early action under Wetlands Preservation (W-3), the Department of Natural Resources has committed funds allocated by the legislature for this program to Snohomish County to acquire portions of the Snohomish Delta wetlands. DNR participated in drafting wetland selection criteria (W-1), compiling the working list of important wetlands (W-2), and drafting the W-4 standards. DNR will use the criteria for marine and estuarine wetlands it is preparing under W-1 for the development of its management program for state-owned wetlands (W-6).

*Review of this
community knowledge
is a better
idea. I will
support it.*

In September 1989 Ecology, with the assistance of a broad-based advisory committee, completed the first draft of standards for local government wetlands protection programs (W-4). A subsequent state Attorney General opinion (1989 No. 21) concluded that Ecology does not have adequate statutory authority to adopt regulations that require local government action to protect wetlands, as initially called for in W-4.

*How can this
be successful?
good to see
good to see?*

The governor has issued an Executive Order (89-10) that requires state executive agencies to adopt action plans that describe how the agency will achieve the state goal of no short-term net loss and a long-term gain of wetlands. A second Executive Order (90-04) requires, among other items, that state executive agencies, including the Departments of Ecology, Natural Resources, Fisheries, Wildlife, Transportation, Agriculture, Community Development, Trade and Economic Development, and Commerce, use their authorities to protect wetlands to the maximum extent possible. Both of these orders will assist in the protection of wetlands by state agencies. No funding was provided for W-6, the Program to Protect Wetlands on State-Owned Lands, and consequently no

progress has been made on this element. W-7, Wetlands Education Strategy, and W-8, Wetlands Restoration Program, were also not funded.

PROGRAM GOAL

To ensure that (1) federal and state agencies, and local and tribal governments establish and coordinate programs to protect wetlands; and (2) in the short term there is no net loss of wetlands function and acreage, and in the long term there is a measurable net gain of wetlands function and acreage in the Puget Sound planning area.

STRATEGY

The strategy for achieving this goal is to : (1) preserve wetlands, either through purchase or some other mechanism; (2) develop and implement local government programs that meet the Authority's standards for protecting wetlands; (3) develop and implement a program for protecting wetlands on state-owned uplands and aquatic lands, including near-shore habitats; (4) develop and implement a long-range wetlands education strategy; (5) inventory wetlands to measure whether the goal of no net loss of wetlands (and, in the future, a net gain) is being met; (6) encourage interagency coordination and assign specific actions to federal agencies; and (7) restore wetlands.

PROGRAM ELEMENTS

W-1. Criteria Development and Program Planning

Ecology and EPA shall actively support the development of local government preservation programs, including funding the development of a local government model preservation program and preservation guidebook. Ecology and DNR shall also work closely with and support the wetland preservation activities of Puget Sound land trusts.

Target Date: Ecology produces guidebook on local preservation program options by September 1991.

[Status: The final criteria to identify wetlands for preservation and report on wetland preservation techniques have both been completed and presented to the Authority. DNR completed the criteria components based on biological functions and characteristics for marine/estuarine wetlands in June 1990. Ecology has received an EPA grant, which it is passing through to King County, for the development of a model local government wetlands preservation program. Ecology will prepare a guidebook based on the results of the King County model.]

W-2. Identification of Wetlands to be Preserved

With Ecology as lead and with assistance from DNR and technical assistance from other state agencies, such as Wildlife and Fisheries, tribal governments, and federal agencies, such as EPA, NOAA, and USFWS, the wetlands to be preserved shall be identified.

The final list may be periodically revised as necessary. Ecology, with assistance from DNR, shall prepare a strategy for periodically revising the final wetlands preservation list. The strategy shall include provisions for (a) coordinating with other elements of the Puget Sound wetlands program, for example, inventory (W-4) and restoration (W-8); (b) identifying and field-checking additional wet-

land sites that should be considered for preservation; and (c) reevaluating sites to ensure they continue to meet preservation criteria.

Documentation shall accompany the final list describing the size, location, and general functions and values of the selected wetlands and demonstrating how the final list of wetlands was chosen. When documentation includes field investigations, sampling shall use, to the extent practicable, protocols and a data management system compatible with the Puget Sound Ambient Monitoring Program. The final list and documentation shall be jointly submitted by Ecology and DNR. The Authority shall review the final wetlands preservation list and documentation of wetlands selected for preservation.

Ecology and DNR shall seek to have wetlands on the preservation list included in other agencies' and groups' acquisition priorities, such as those of the USFWS, the National Park Service, the Department of Wildlife, The Nature Conservancy, the Trust for Public Lands, and the Washington Wildlife and Recreation Coalition.

Target Date: Final wetlands preservation list submitted to the Authority by December 1, 1990. Strategy for ongoing revision of the list submitted to the Authority by April 1, 1992.

[Status: Ecology held public workshops around the Sound in March and April 1988. In September 1988 Ecology distributed a questionnaire to local governments, citizens' groups and other entities, and individuals to solicit nominations of wetlands for preservation. Over 100 wetlands were nominated, and many of these were field-checked by Ecology in 1989. The first draft of the working list of Puget Trough Report sites was submitted to the Authority by November 1, 1988.]

W-3. Wetlands Preservation

3.1. Acquisition

With DNR as lead and with assistance from Ecology and other state and federal agencies and tribal governments, the state shall take actions necessary, including a vigorous attempt to seek funding, to preserve and protect in perpetuity those wetlands identified under element W-2. This is an ongoing program in which specific sites are protected as funds and other mechanisms become available. DNR may make grants to local governments and other entities wishing to sponsor wetlands preservation projects.

DNR and Ecology shall recommend a preservation strategy for each site that includes (a) a technical rating of site preservation value; (b) the urgency of the securing action; (c) preliminary site management and preservation methods; (d) an analysis of effects that recent federal and state court decisions¹¹ dealing with the public trust doctrine may have on preservation strategies; and (e) an appropriate management entity(ies).

DNR shall submit annual reports to the Authority and Ecology on its preservation and acquisition activities and, if necessary, make interim reports where high-quality wetlands are known to be imminently threatened by degradation.

¹¹ For example, Phillips Petroleum Company v. Mississippi, 108 S. Ct. 791 (1988).

3.2. Long-Term Management

DNR, in consultation with Ecology and other state and federal agencies, shall develop a general strategy to identify ongoing management needs so that long-term protection of acquired sites is ensured. This strategy shall include (a) general management standards to ensure that wetlands secured by the preservation program are protected in perpetuity; and (b) establishment of a Puget Sound wetlands preservation and management endowment together with authorizing legislation, if needed.

Funds appropriated to DNR to carry out this program shall be expended consistent with the agencies' recommended site preservation strategy. All government and private entities are encouraged to use other appropriate funds available to them to acquire wetlands in accordance with each specific site preservation strategy.

After sites are secured, a detailed site management plan shall be developed and implemented. Site plans shall be developed by the management entity in consultation with DNR, Ecology, and other state agencies and shall meet the general management standards and include any necessary site-specific requirements. Management plans may include educational components that are developed in consultation with the Environmental Education Task Force (see element EPI-2.4) and with the wetlands education strategy (W-7).

DNR and Ecology shall provide technical advice and limited staff support to any agency, local government, tribal government, organization, or private party wishing to take the lead in preserving any site, including those not on the final list. State preservation actions should coordinate with and complement preservation programs of other federal and state agencies and private organizations such as The Nature Conservancy and Trust for Public Lands. Data on functions, values, and acreages of all wetlands preserved under this program shall be provided to the Department of Ecology as sites are acquired for inclusion in the wetlands tracking system (W-4.3) for measuring progress in achieving the wetlands program goal of no net loss of wetlands in Puget Sound.

Target Date: Initiate acquisition for most important sites on August 1, 1988. Identify recommended preservation strategies and appropriate management entities for sites on the final list by July 1, 1992. Submit general management strategy to the Authority by December 1, 1992. Develop site preservation and management plans as funding and other mechanisms become available. Submit first annual progress report submitted to the Authority by July 1, 1991.

[Status: DNR has taken early action to acquire wetlands in Snohomish, King, Mason, and Jefferson counties. As sites on the preliminary list become available, DNR is continuing acquisition activities. No funds were provided for staff for this element in the 1989 plan, so the management guidelines and other tasks have not been accomplished.]

W-4. Enhanced Regulatory Program for Wetlands Protection

4.1. Puget Sound Local Government Wetland Protection Programs

The text in italics in W-4.1 is not adopted as part of the Puget Sound Water Quality Management Plan but is printed here as a proposal for public review and comment.

The Authority shall develop and adopt minimum standards or guidelines for local government wetland protection programs. If the standards are adopted as mandatory standards, the Authority may either require that local government wetland protection programs meet or exceed the standards or require that local government wetland protection programs substantially comply with the standards.

The Authority is including text of the proposed minimum standards or guidelines in this document to provide for public review and comment. The Authority is seeking comment on whether it should adopt mandatory standards or guidelines. The Authority is also seeking comment on the content of the standards.

Target Dates: Authority chooses either minimum standards or guidelines in final draft by April 30, 1991 and publishes them for review. Authority adopts final standards or guidelines by August 1, 1991.

4.1.1. Puget Sound Plan Proposed Minimum Standards for Local Government Wetlands Protection Programs

[All local governments in the Puget Sound planning area, except as provided below, shall develop, adopt, administer, and enforce a wetlands protection program which meets the minimum standards established in this element. This requirement can be met through the local government's adoption of development regulations and designations of critical areas required by the Growth Management Act, Chapter 17, Laws of 1990, 1st ex. Sess. (SHB 2929), provided that the program meets or exceeds these minimum standards before September 1, 1991.]

Each local government that has enacted a wetlands protection program as of the date of adoption of this plan element shall submit a copy of its program to the Authority within 90 days of the element's adoption date. Upon receipt by the Authority, each program shall be considered in compliance with the plan's minimum standards until July 1, 1993. After July 1, 1993 all local governments must conform at least to the plan's minimum standards, or be deemed substantially in compliance by the Authority.

Local governments should ensure that until adoption of the program, regulated activities in a regulated wetland or its buffer comply with the spirit and intent of these standards.

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To provide consistency with Executive Order 90-04, local governments may submit programs to the Department of Ecology for advice.]

4.1.2. Program Goal

[Each program shall, at a minimum, use the following goal: It is the short-term goal to achieve no net loss of the remaining wetlands in the Puget Sound planning area, defined by acreage and function, and it is the long-term goal to restore and create wetlands, where feasible, to increase the quantity and quality of wetlands.

Local governments will take into account the significance of program decisions on the overall no net loss goal; for example, decisions to allow small area or other exemptions, the possible failure of compensation projects, and stormwater damage to wetlands function and acreage.

It is the intent of these minimum standards to preserve, protect, manage, and regulate wetlands for the purposes of promoting public health, safety, and general welfare while (a) conserving fish, wildlife, and other natural resources of the Puget Sound planning area; (b) protecting the ecological and economic benefits to the public of wetlands functions and values; (c) regulating property use and development to maintain the natural and economic benefits provided by wetlands, consistent with the general welfare of the state; (d) protecting private property rights consistent with the public interest; and (e) providing for protection against direct and indirect wetlands impacts by providing regulatory authority for management of wetland buffers.]

4.1.3. System for Approvals

[Each program shall define a system of permits or other approval/disapproval mechanisms that the local government will use to prohibit all regulated activities within regulated wetland areas or wetland buffers, unless the proposed activities are conditioned to avoid adverse impacts or take affirmative and appropriate measures to minimize and compensate for any such unavoidable and necessary impacts. Existing permit systems should be amended to incorporate these standards.]

4.1.4. Regulated Wetlands

[The program, at minimum, shall define regulated wetlands as: ponds under twenty (20) acres including their submerged aquatic beds and areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Regulated wetlands generally include swamps, marshes, bogs, and similar areas. Regulated wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities. Wetlands created as mitigation and wetlands modified for approved land use activities shall be considered as regulated wetlands.

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Category III and IV wetlands of less than 10,000 square feet may be excluded from some or all provisions of local wetlands protection programs. In the case of applications for owner-occupied single family residences, Category IV wetlands of less than 20,000 square feet may be excluded from some or all provisions of local wetlands protection programs.

For identifying and delineating a regulated wetland, local governments shall consider the "Federal Manual for Identifying and Delineating Jurisdictional Wetlands."

4.1.5. Wetland Categories

[For assistance in determining wetland buffer widths, replacement ratios and avoidance criteria, each local wetlands program shall utilize the Washington State Four-tier Wetlands Rating System or the Puget Sound Region Four-tier Wetlands Rating System, as developed by the Department of Ecology.]

4.1.6. Wetland Buffer Zones

[Each program shall require the establishment of wetland buffer zones, at least as protective as those specified in the ranges below, around all regulated wetlands to protect them from regulated activities. In determining specific buffer-zone widths for any of the categories, local governments shall identify and take into account the intensity of adjacent land use.

Category I	200-300 feet
Category II	100-200 feet
Category III	50-100 feet
Category IV	25-50 feet

Local governments, after a substantial showing, including consideration of adequate documentation may increase buffer zone widths when:

- a. A larger buffer is necessary to maintain viable populations of existing species;*
- b. The wetland is used by species proposed or listed by the federal government or the state as endangered, threatened, rare, sensitive, or monitor; is essential or outstanding potential habitat for those species; or has unusual nesting or resting sites such as heron rookeries or raptor nesting trees;*
- c. The adjacent land is susceptible to severe erosion, and erosion control measures will not effectively prevent adverse wetland impacts;*
- d. The adjacent land has minimal vegetative cover or slopes greater than 15 percent.*

Local government, after a substantial showing, including adequate documentation, may reduce standard buffer zone widths for any category of wetland on a case-by-case basis. For Category I, II, and III wetlands, in no case shall the buffer width be

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reduced by more than 25 percent of the standard buffer width. Category IV wetlands may be reduced by more than 25 percent of the standard buffer width.

The provision for reducing standard buffer zone widths applies when the adjacent land is extensively vegetated, has less than 15 percent slopes, and no adverse impacts to regulated wetlands will result from a regulated activity, or when the project includes a buffer enhancement plan.

A buffer enhancement plan shall use and maintain existing or replacement native vegetation to improve the functional attributes of the buffer to provide additional protection for wetlands functions and values.

Programs shall not allow regulated activities in wetland buffer zones except for: activities having minimal adverse impacts on buffers and no adverse impacts on regulated wetlands, such as low intensity, passive recreational activities such as pervious trails, nonpermanent wildlife watching blinds, short-term scientific or educational activities, and sports fishing or hunting; and only in categories III and IV buffer zones, stormwater treatment facilities having no practicable alternative on-site location.

Each program may only allow buffer width averaging where it is demonstrated that the wetland contains variations in sensitivity due to existing physical characteristics, and such averaging will not adversely impact the regulated wetland functions or values.

For protection purposes each program shall require that the location of all buffer zones be clearly marked on sites prior to, and at least during, site work.]

4.1.7. Regulated Activities

[Each program shall require prior approval for any of the following activities, at a minimum, in regulated wetlands or their buffers:

- a. The removal, excavation, grading, or dredging of soil, sand, gravel, minerals, or organic matter, or material of any kind;*
- b. The dumping, discharging, or filling with any material;*
- c. The draining, flooding, or disturbing of the water level or water table;*
- d. The driving of pilings;*
- e. The placing of obstructions;*
- f. The construction, reconstruction, demolition, or expansion of any structure;*
- g. The destruction or alteration of wetlands vegetation through clearing, harvesting, shading, intentional burning, or planting of vegetation that would alter the character of a regulated wetland, provided that these activities are not part of a forest practice governed under chapter 76.09 RCW and its rules; or*

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h. Activities that result in a significant change of water temperature, a significant change of physical or chemical characteristics of wetlands water sources, including quantity, or the introduction of pollutants.]

4.1.8. Avoiding Wetland Impacts

[Local governments shall prohibit regulated activities in category I regulated wetland.

Local governments shall prohibit regulated activities in categories II, III, and IV regulated wetlands unless an applicant can show that the impact is both unavoidable and necessary, as follows:

Water-dependent activities may be approved where there are no practicable alternatives which would (a) not involve a regulated wetland or which would have less adverse impacts on a regulated wetland; and (b) would not have other significant adverse environmental consequences.

Non-water-dependent activities shall only be approved upon a demonstration that: (a) the basic project purpose cannot reasonably be accomplished utilizing one or more other sites in the general region that would avoid, or result in less, adverse impact on a regulated wetland; and (b) a reduction in the size, scope, configuration, or density of the project as proposed and all alternative designs of the project as proposed that would avoid, or result in less, adverse impact on a regulated wetland or its buffer will not accomplish the basic purpose of the project; and (c) in cases where the applicant has rejected alternatives to the project as proposed due to constraints such as zoning, deficiencies of infrastructure, or parcel size, the applicant has made reasonable attempts to remove or accommodate such constraints.

Following the application of the avoidance standards as in 4.1.8 above, each program may allow, on a case-by-case basis, regulated activities on Category II, III and IV regulated wetlands where: (a) the applicant can demonstrate that there is a compelling public need for the proposed activity that is greater than the need to protect the wetland and the compelling public need cannot be met by alternative projects in the region; or (b) the applicant can show that he or she would suffer an extraordinary hardship if the activity, or part of the activity, were not allowed.

As an alternative, each program may allow regulated activities on category IV wetlands where the proposed activity is the only reasonable alternative which will accomplish the applicant's objectives. In evaluating an applicant's proposal and objectives, local governments should give specific consideration to hardship that would be incurred if the project were moved off-site.]

4.1.9. Minimizing Wetlands Impacts

[Each program shall require that deliberate actions, including but not limited to the following, be taken during design, construction, and implementation to minimize impacts of projects which are allowed to alter wetlands:

a. Limiting the degree or magnitude of the regulated activity;

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- b. *Limiting the implementation of the regulated activity;*
- c. *Using appropriate and best available technology;*
- d. *Taking affirmative steps to avoid or reduce impacts;*
- e. *Using sensitive site design, and siting facilities and construction staging areas away from regulated wetlands and their buffers;*
- f. *Involving resource agencies early in site planning; and*
- g. *Providing protective measures such as siltation curtains, hay bales, and other prevention measures, and scheduling the regulated activity to avoid interference with wildlife and fisheries rearing, resting, nesting, or spawning activities.]*

4.1.10. Compensating for Wetlands Impacts

[Each program shall, at a minimum, require compensation for losses of wetlands that are necessary and unavoidable (as in W-4.1.8.) and have been minimized to the maximum extent practicable (as in W-4.1.9.). The program shall require the applicant proposing regulated activities to develop a detailed and site-specific plan, for both the wetland being created and the wetland being modified, that includes at a minimum: environmental impact assessment including mapping, construction detail, maintenance, and monitoring of wetlands; performance standards to assess how well the compensation is working; financial arrangements including bonding; and details of the expertise of persons responsible for performing the compensation project. The purpose of wetlands compensation is to recreate as nearly as possible the original wetlands in terms of acreage, function and value, geographic location, and setting.

Where in-kind replacement is not feasible or practical due to the characteristics of existing wetlands, substitute resources of equal or greater ecological value should be provided. The overall goal of any compensatory project shall be no net loss of wetlands function and acreage. Compensation shall be completed prior to wetland destruction, where possible.

Each program shall use the following minimum replacement ratios for creation or restoration which is in-kind, on-site, timed prior to or concurrent with alteration, and has a high probability of success:

Category I	6:1
Category II or III	
Forested	3:1
Scrub-shrub	2:1
Emergent	1.5:1
Category IV	1.25:1

(The first number is the area of wetlands being created or restored and the second number specifies the area being altered.)

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The program shall require increased ratios when: there is uncertainty as to the probable success of the proposed restoration or creation; a significant period of time will elapse between destruction and replication of wetland functions; the compensation will not have as great a function value as the original wetlands; or the proposed compensation is off-site.

The program may allow decreases in these ratios on a case-by-case basis, provided that the ratio is never less than 1:1 and adequate studies, coordinated with agencies with expertise, demonstrate that no net loss of wetland function or value will occur under the decreased ratio.

Each program shall allow for enhancement of existing, significantly degraded wetlands to compensate for wetland losses. The person proposing to enhance wetlands shall document how enhancement conforms to the overall goals and requirements of the program and any regional goals. The minimum size of a wetlands enhancement compensation project shall be double the applicable replacement ratios (above). Category I wetlands shall not be enhanced for compensation.

The program may allow cooperative restoration, creation, or enhancement projects where a single applicant or other organization with demonstrated capability may undertake a compensation project with funding from other applicants in the following circumstances: providing for restoration, creation, or enhancement at a particular site may be scientifically difficult or impossible; or creation of one or several larger wetlands may be preferable to many small wetlands. Under these circumstances arrangements may be made by local governments to collect funds from applicants. These funds would be used by local government to fully cover the future cost of completing wetlands compensation projects according to the replacement ratios above. Wetlands mitigation banking shall be based on the findings of the mitigation banking study identified in element W-5.]

4.1.11. General Permit

[Local governments may use a general permit process to allow some activities without the need for individual permits in the following circumstances: to provide for emergencies and other exceptional circumstances; to continue and maintain existing, lawfully approved activities and structures; and to streamline regulation of activities with minimal impacts, as follows:

These activities when conducted using applicable best management practices, except where the activities result in the conversion of a regulated wetland to a new use:

- a. Existing agricultural activities including farming, horticulture, aquaculture, irrigation, grazing of animals, and conventional fallow rotation. Activities which bring an area into agricultural use are not part of an existing operation;*
- b. Maintenance of farm or stock ponds, irrigation ditches, and drainage ditches (but not construction);*

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c. Forest practices under Chapter 76.09 RCW and its rules providing that the practices are consistent with the no net loss goal and provided local permits are consistent with 76.09.240 RCW;

d. Normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas and site investigative work necessary for land use application submittals such as surveys, providing, in every case, wetland impacts shall be minimized and disturbed areas shall be immediately restored; and

e. Minor modification of existing serviceable structures within a buffer zone where modification does not adversely affect wetland functions and where impacts within buffers are minimized and disturbed areas immediately restored.]

4.1.12. Definitions

[Local government shall use these definitions to ensure consistent application of the standards.

"Practicable alternative" means an alternative that is (a) available and capable of being carried out after taking into consideration cost, existing technology, and logistics of the overall project purposes; and (b) has less impacts on regulated wetlands. It may include an area not owned by the applicant which could reasonably have been or be obtained and used in order to fulfill the basic purpose of the proposed activity.

"Reasonable alternative" means an activity that could feasibly attain or approximate a proposal's objectives, but at a lower environmental cost or decreased level of environmental degradation. Reasonable alternatives may be those over which the local government has authority to control impacts.

"Water-dependent" means that the use of surface water would be essential to fulfill the purpose of the proposed project.

"Unavoidable and necessary impacts" are impacts to regulated wetlands that remain after a person proposing to alter regulated wetlands has demonstrated that no practicable alternative exists for the proposed project.

"Functions and values" means the beneficial roles served by wetlands including, but not limited to, water quality protection and enhancement, fish and wildlife habitat, food chain support, flood storage, conveyance and attenuation, groundwater recharge and discharge, erosion control, wave attenuation, historical and archaeological value protection, aesthetic value, and recreation.

"Extraordinary hardship" means the strict application of the program adopted to implement this plan element by the local government that would prevent all reasonable economic use of the parcel.

"On-site compensation" means to replace wetlands at or adjacent to the site on which a wetland has been impacted by a regulated activity.

"Offsite compensation" means to replace wetlands away from the site on which a wetland has been impacted by a regulated activity.

"Out of kind compensation" means to replace wetlands with substitute wetlands whose characteristics do not closely approximate those destroyed or degraded by a regulated activity.

"In-kind compensation" means to replace wetlands with substitute wetlands whose characteristics closely approximate those destroyed or degraded by a regulated activity.

"Restoration" means actions performed to intentionally reestablish wetland functional characteristics and processes which have been lost by alterations, activities, or catastrophic events within an area which no longer meets the definition of a wetland.

"Creation" means actions performed to intentionally establish a wetland at a site where it did not formerly exist.

"Wetland enhancement" means actions performed to improve the condition of existing degraded wetlands so that the functions they provide are of a higher quality.

Target Dates for local government: Pursuant to the Growth Management Act, local governments will adopt development regulations precluding incompatible uses and development in wetlands by September 1, 1991, and adopt comprehensive plans by July 1, 1993.]

The adopted text of the Puget Sound Water Quality Management Plan resumes here.

4.2. State Agency Actions

The Authority, with assistance from Ecology, shall provide guidance where necessary to local governments in the preparation of development regulations for wetlands in relation to the Growth Management Act (SHB 2929).

State agencies shall take the following actions in coordination with the implementation of Executive Order 90-04:

Ecology shall rigorously enforce authorities available to it under the federal Clean Water Act, including Sections 401, 402, 319, 320, and 305(b), and state laws and regulations, including but not limited to SEPA and the Shoreline Management Act, to protect wetlands in the Puget Sound basin to the maximum extent possible. This shall include granting, denying, or conditioning of water quality certifications of all federal permits to protect wetlands. Ecology, to the extent authorized by law, shall condition or deny water quality certifications under Section 401 of the federal Clean Water Act to prevent degradation of wetlands and shall re-evaluate Section 401 certification of nationwide permits affecting wetlands at such time as these permits are revised by the Army Corps of Engineers or when the existing certification expires in 1992, whichever comes first.

In addition, Ecology shall ensure that water in wetlands is included in the State Water Quality Standards (Chapter 173-201 WAC), and shall explore the feasibility of further application of existing laws (especially RCW 90.48, Water Pollution Act) to protect wetlands.

The Departments of Fisheries and Wildlife shall provide more stringent review of Hydraulic Project Approvals in the Puget Sound basin and shall use their authorities under the Hydraulics Code to condition or deny HPAs to assure wetlands protection to the extent that fish life or habitat is also protected.

The Department of Natural Resources shall assist the Forest Practices Board in providing greater protection to wetlands through Chapter 222 WAC. The Board shall adopt revisions to Chapter 222 WAC that will protect wetlands and help achieve the goal of the Puget Sound Wetlands Protection Program. DNR shall submit a report to the Authority on the progress made in protecting wetlands through its work with the Forest Practices Board.

The state Department of Agriculture shall work cooperatively with the Soil Conservation Service, local governments, and other agencies to implement best management practices in meeting the wetlands program goal, especially in relation to General Permits, item W-4.1.11.

Target Date: DNR to submit a report on wetlands protection progress made with the Forest Practices Board by July 1, 1991. Ecology to include water in wetlands in State Water Quality Standards by July 31, 1991. Other actions ongoing.

4.3 Inventory and Tracking Strategy

In coordination with the Puget Sound Geographic Information System (M-4), Ecology shall work with the departments of Natural Resources and Community Development, the U.S. Fish and Wildlife Service, and other appropriate entities and agencies to develop a wetlands inventory strategy for the Puget Sound basin.

Ecology, in coordination with federal and state agencies, and local and tribal governments, shall use existing wetland inventories, permit tracking systems, and other relevant information to establish a tracking system for performance evaluation in achieving the wetlands program goal of no net loss and long-term gain of wetlands in Puget Sound. This tracking system shall monitor, where practicable, wetlands impacts and mitigation requirements that are permitted under the State Hydraulics Code, Section 404 of the federal Clean Water Act, shoreline permits, forest practices permits, aquatic lands leasing, National Pollutant Discharge Elimination Permits (NPDES), the Puget Sound Dredged Disposal Analysis Program, and local permits for clearing, grading, and building. The Corps of Engineers shall provide Ecology with tracking information on Section 404 permits in Puget Sound.

Ecology, in cooperation with EPA and USFWS, shall submit a biennial report, based on the tracking system, to the PSEP Management Committee on progress in achieving the wetlands program goal. Ecology shall coordinate with the Authority, EPA, USFWS, and state resource and information management agencies to identify where and how data from the wetlands tracking system should be stored.

The Departments of Fisheries, Wildlife, and Natural Resources shall assist Ecology in the establishment of the tracking system and shall provide Ecology with permit tracking information on hydraulic project approvals, forest practices applications, and aquatic lands leases.

DNR and other state agencies shall provide the Department of Ecology with information on the status of wetlands functions, values, and acreage on state-owned lands under each agency's management to assist in Ecology's monitoring of progress in achieving the wetlands program goal of no net loss of wetlands in Puget Sound.

Target Date: Ecology completes an inventory strategy report by March 1, 1991. Ecology submits biennial reports, based on its wetlands tracking system, beginning July 1, 1992.

W-5. Local Wetlands Programs Interagency Coordination and Federal Role

The Puget Sound Estuary Program (PSEP) Management Committee, with the Authority providing staff support, shall prepare a long-term strategy for improved interagency coordination to assist in implementing the Puget Sound Wetlands Protection Program.

The strategy shall consider: how relevant agencies and programs for wetlands preservation, protection, research, and restoration can be better coordinated to: (a) develop consistent preservation goals, selection criteria, assessment methodologies, funding priorities, data and information systems, and site management guidelines; (b) enhance agencies' regulatory, technical assistance, education and public outreach, and funding programs; (c) encourage uniform and effective application of standards and guidelines; (d) encourage timely and effective agency coordination of comments on federal, state, and local permit applications; (e) provide technical assistance; and (f) integrate the findings of Ecology's Enhanced Regulatory Study into the long-term strategy.

The PSEP Management Committee shall involve the U.S. Army Corps of Engineers, the Soil Conservation Service (and other USDA agencies, as appropriate), the National Park Service (and other agencies of the Department of Interior, as appropriate), the U.S. Fish and Wildlife Service, the U.S. Geological Survey, the National Oceanic and Atmospheric Administration, the National Marine Fisheries Service, and the Washington Departments of Fisheries, Wildlife, Natural Resources, Agriculture, Community Development, and the State Parks and Recreation Commission in the development and implementation of this strategy. Local and tribal governments that are implementing tasks under the Puget Sound wetlands program also shall be invited to participate.

To assist the PSEP Management Committee, Ecology, in consultation with other federal and state agencies and local governments, shall prepare a study of ways to enhance regulatory protection for water quality and habitat functions of wetlands in the Puget Sound basin. This study shall: (a) identify types and importance of wetlands and related habitats which require additional protection; (b) identify agency rules that could or should be amended to enhance wetlands protection; (c) identify funding sources for the development and implementation of local government wetlands programs; (d) review possible implementation mechanisms for Ecology's authorities to protect wetlands under RCW Chapters 43.21C, 90.54, 90.48, 90.58, and other authorities; (e) report on the development and implementation a model wetlands ordinance that is applicable to Puget Sound local governments; (f) report on ways to enhance the implementation of the program by identifying and, where possible, providing technical assistance; and (g) identify an early coordination mechanism among local, state, and federal agencies with related/overlapping permitting requirements to ensure, to the extent possible, consistency and predictability in the processing of appropriate permits at the various governmental levels.

In addition, federal agencies shall undertake the following activities in support of the Puget Sound wetlands program:

1. The U.S. Army Corps of Engineers shall, where feasible:
 - a. Ensure that public notices for permits under Section 404 of the federal Clean Water Act and Section 10 of the Rivers and Harbors Act include specific information, such as (i) the size of the wetland to be affected and any associated stream or other body of water; (ii) possible cumulative effects from the proposal in the watershed or estuarine/ nearshore habitat; (iii) a mitigation plan summary based on the system of mitigation sequencing in Chapter 197-11 WAC; and (iv) whether an alternatives analysis is available.
 - b. Address the cumulative effects of wetlands losses under the nationwide permit program, applying its discretionary authority to require individual permits for proposals in watersheds in the Puget Sound basin where wetland losses exceed wetland gains.
 - c. Ensure that 404 permit applications are approved only when they are consistent with state wetlands guidelines and local government wetlands protection programs (W-4), unless state and local regulations are less protective of wetlands than Corps requirements.
 - d. Develop partnerships with other federal and state agencies and local and tribal governments to conduct special area management planning and advanced identification in the Puget Sound basin.
 - e. Actively seek opportunities for creation and restoration of wetlands in Puget Sound.
 - f. Take whatever action is possible to incorporate local and state comments into the products of the Nationwide Permit Task Force that is currently considering revisions to the nationwide permit process, and where possible seek local and state involvement in the scheduled review of the nationwide permit review process in January 1992.
 - g. Explore all possibilities to use its discretionary authority to rescind the Nationwide Permit #26 (authorizes discharges of fill in up to 10 acres of isolated wetlands) in the Puget Sound basin, and provide a brief report to the PSEP Management Committee on this matter.
2. The U.S. Fish and Wildlife Service shall, where feasible:
 - a. Provide challenge grants to state agencies and Puget Sound local governments and private entities for wetlands acquisition, restoration, and enhancement projects in coordination with W-3 and W-8.
 - b. Provide challenge grants or funds for, and participate in, wetland inventories consistent with the state inventory strategy for the Puget Sound basin, and status and trends studies.
 - c. Provide technical assistance to other federal and state agencies, and local and tribal governments in Puget Sound on fish and wildlife use of wetlands habitats, impact assessment, and mitigation planning.
 - d. Participate with the Corps of Engineers in the development of Special Area Management Plans in the Puget Sound basin.

- e. Assist Ecology in the preparation of the biennial report to the Authority on progress in achieving the no net loss/net gain goal.
- 3. The Environmental Protection Agency shall, where feasible:
 - a. Provide technical assistance to Ecology and other state, federal, and local agencies in their wetlands protection activities.
 - b. Promote Ecology's use of the water quality certification process under Section 401 of the federal Clean Water Act to protect wetlands in Puget Sound.
 - c. Develop partnerships with other federal and state agencies, and local and tribal governments to conduct special area management planning and advanced identification in Puget Sound.
 - d. Provide technical assistance to other federal and state agencies, and local and tribal governments in Puget Sound on fish and wildlife use of wetlands habitats, impact assessment, and mitigation planning.
 - e. Undertake a study of the implications and appropriateness of wetlands mitigation banking for the Puget Sound planning area. The study will identify the costs and benefits, from a resource conservation perspective, of wetlands mitigation banking, report on the overall potential of regional resources to achieve no net loss as a short term goal, and recommend strategies for mitigation banking. EPA shall consult with federal and state natural resource agencies, local and tribal governments, and other groups and individuals as appropriate.
- 4. The Corps, USFWS, and EPA shall, where feasible:
 - a. Provide funds for local government inventories consistent with the state inventory strategy for the Puget Sound basin, identify high-threat areas for which to target funding, research restoration and creation techniques and monitoring protocols, and conduct other studies necessary to achieve the goals of this program.
 - b. Assist Ecology in the preparation of the biennial report to the Authority on progress in achieving the no net loss/net gain goal.
 - c. Work cooperatively with other federal and state agencies and local and tribal governments to develop techniques for addressing cumulative effects of wetlands degradation and/or loss and functional assessments of wetlands.
 - d. Participate with other agencies to provide wetlands public education and delineation training.
 - e. Provide timely comments or technical assistance on Section 404 permits in Puget Sound to ensure that impacts on wetlands are first avoided, then minimized to the maximum extent possible prior to approval of compensatory mitigation.

Target Date: PSEP, with Authority staff support, prepares strategy for inter-agency coordination by December 1, 1991, and revises strategy necessary. Corps, USFWS, and EPA implement W-5 activities by July 1, 1991. Ecology submits study to the PSEP Management Committee by October 1, 1991. Corps completes report to PSEP Management Committee by July 1, 1991.

W-6. Program to Protect Wetlands on State-Owned Lands

For state-owned uplands and aquatic lands managed by the Department of Natural Resources (DNR), DNR shall use its authorities and programs to ensure that existing wetlands are preserved and protected.

At a minimum, DNR's program for protecting wetlands on state-owned uplands and aquatic lands managed by DNR shall:

- Inventory nearshore habitats (M-2) and wetlands, including wetlands that would benefit from restoration. DNR shall use data management systems for the inventory that are consistent, to the maximum extent possible, with the Puget Sound Geographic Information System and the Ecology wetlands inventory strategy developed under W-4.
- Study the laws, regulations, policies, and programs and their implementation pertaining to DNR's upland and aquatic land management responsibilities to determine their effectiveness in protecting wetlands on lands under DNR management. DNR shall propose amendments if needed.
- Coordinate with the Authority and Ecology to ensure that DNR management programs for state-owned uplands and aquatic lands are at least as protective of, and consistent with, the Authority's local government wetland standards (W-4).
- Be consistent with local government development regulations and comprehensive plans adopted pursuant to SHB 2929.
- Consider the use of appropriate wetlands for educational purposes including development of interpretive programs and displays.
- Prepare a strategy and implement a management program for wetlands on state-owned uplands and aquatic lands in the Puget Sound basin. This program shall (a) be implemented through DNR's proprietary authorities for state-owned aquatic lands; (b) be based on the W-4.3 wetlands inventory and the nearshore habitat inventory under element M-2, and on Fisheries' Marine Fish Program results, where appropriate; (c) address habitat protection; (d) consider use of appropriate wetlands for educational purposes, including development of interpretive programs and displays (in coordination with W-3 and with the wetlands education strategy (W-7)); and (e) include review of key regulatory actions of other agencies, use of appropriate conditions in aquatic lands leases, and withdrawal of critical aquatic land areas from leasing.

Progress Report. DNR shall submit a biennial progress report to the Authority that describes DNR's program for preserving and protecting wetlands on lands managed by DNR. At a minimum, the report shall include:

- A summary of the programs for protecting wetlands on state-owned uplands and aquatic lands managed by DNR;
- The types and values of wetlands inventoried on state-owned aquatic lands;
- A description of the procedures developed for complying with local wetlands programs and the Authority's W-4 standards in DNR's management of wetlands on state-owned uplands;

- The results of the study of laws, regulations, programs, and policies pertaining to DNR's land management responsibilities, including recommendations, if needed, for strengthening provisions for wetlands protection; and
- An estimate of funding required to implement the overall wetlands protection program for state-owned lands under DNR management.

Target Date: DNR submits biennial progress reports to the Authority beginning April 1, 1992.

[Status: DNR has begun the inventory of aquatic wetlands. The department will begin the inventory of state-owned upland wetlands in the 1991-93 biennium.]

W-7. Wetlands Education Strategy

Ecology shall develop and implement a long-range wetlands education strategy that augments Ecology's existing wetlands education program. The strategy shall involve entities and individuals possessing expertise in the field of wetlands education. These include staff from the U.S. Fish and Wildlife Service, DNR, Fisheries, Wildlife, the Environmental Education Task Force, local and tribal government, and private nonprofit conservation groups. EPA shall assist Ecology in the development of the strategy, shall carry out EPA programs consistent with the strategy, and shall use its enforcement program as an educational tool.

The strategy shall target local governments, as well as schools and the general public, groups such as landowners, professional and civic organizations, and interest groups. It shall address wetlands characteristics, functions, values, the Wetlands Protection Program, the need for training of wetlands educators, and other important wetlands issues.

Ecology shall work with those federal and state agencies and groups mentioned above to implement the components of the strategy, which may include (a) guidebooks on wetlands protection techniques; (b) wetland resource teams in coordination with EPI-2.3; (c) model and site-specific interpretive programs in coordination with W-3; and (d) public workshops and field trips. To the extent possible, public libraries shall be provided with wetlands education materials for their patrons.

Target Date: Ecology submits Wetlands Education Strategy to the Authority by June 1, 1992, prepares model interpretive program by October 1992, and conducts public workshops and field trips and other short-term educational activities as needed.

[Status: Due to funding limitations in the 1989-91 biennium, the primary focus of activities in the 1989-91 biennium included the resource teams, short-term educational needs, and support for other elements of the wetlands protection program.]

W-8. Wetlands Restoration Program

W-8.1. Early Action

Ecology, EPA, and the USFWS, in consultation with other agencies, shall take action to implement, concurrently with the overall W-8 program, a pilot restoration program for two or three specific wetland sites in Puget Sound. To expedite the program, sites could be chosen where land is already acquired, and programs could be developed to: (1) restore estuarine wetlands no longer util-

ized for agriculture, for example, by removing or restoring dikes; (2) restore wetlands currently being degraded by nonpoint and/or point sources of pollution by addressing the causes of pollution; and (3) address restoration through the removal of exotic plant species, such as purple loosestrife or spartina.

Ecology, EPA, and the USFWS shall submit to the PSEP Management Committee a brief strategy for a wetlands restoration pilot program, including a timetable for completion.

W-8.2 Program Development and Implementation

Ecology, EPA, USFWS, and the Corps shall develop and implement a program to restore wetlands in the Puget Sound basin. At a minimum, this program shall include:

why the federal emphasis

1. Definition of the term "restoration";
2. Description of goals and objectives for the restoration program, including how the program contributes to achieving the no net loss and net gain goal of the Wetlands Protection Program;
3. Analysis of existing research on restoration methods, costs, and sites and evaluation of the success of wetlands restoration efforts undertaken as permit requirements, such as Section 404 and 401 of the Clean Water Act, SEPA, and Hydraulic Project Approvals;
4. The identification of appropriate restoration wetlands for acquisition in consultation with the Departments of Natural Resources, Fisheries and Wildlife, tribal and local governments;
5. Site management plans and identified management entities for appropriate restoration projects;
6. Estimate of the costs of a comprehensive restoration program and options for funding, for example, bond measures, excise taxes, funds allocated by the legislature for acquisition of degraded wetlands, coordination with the Puget Sound Cost and Financing Study (EM-5), and other mechanisms for purchase or non-fee simple acquisition;
7. Procedures for coordinating the restoration program with the preservation program (W-1, 2, and 3); the enhanced regulatory program (W-4); the program to protect wetlands on state-owned lands (W-6); and the wetlands education program (W-7); and
8. An evaluation of the potential of creating new wetlands to assist in meeting the overall wetlands program goal.

Ecology shall work with federal agencies, especially EPA, the Corps of Engineers, and the U.S. Fish and Wildlife Service, and the Department of Natural Resources and other state and local agencies, as well as interested and affected parties, in developing and implementing this program.

Ecology, EPA, USFWS, and the Corps shall prepare a report describing the program for accomplishing the tasks outlined in 8.2 above. Restoration projects at specific wetlands sites may proceed prior to completion of the report.

Target Date: Ecology to provide a brief strategy document for pilot restoration projects by December 1, 1991. Ecology, EPA, USFWS, and the Corps to submit

a report describing the overall program to the Authority by July 1, 1992. Restoration projects will be undertaken as funding becomes available.

[Status: This element will begin in July 1991. The EPA study of potential restoration sites in Puget Sound was completed in October 1988. EPA's restoration assessment and monitoring guidance is in progress. It is anticipated that analysis of existing research (under item 8.2) will include an examination of the results of these EPA studies to determine if adequate information is provided to identify specific candidate restoration sites in Puget Sound and to initiate restoration activities. W-8.1 has been added to provide for a pilot restoration program.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Ecology's preservation final list (W-2).
2. DNR's program for wetlands on state-owned land (W-6).
3. Ecology's wetlands education strategy (W-7).
4. Ecology, EPA, USFWS and Corps wetlands restoration program (W-8).

LEGISLATION REQUIRED

Some amendments to existing statutes may be recommended to provide funding for local government wetlands programs and to implement other aspects the program.

ESTIMATED COST

Costs for this program will be similar to those contained in the draft 1989 plan, except that the capital budget request for W-3 (wetlands acquisition) is proposed to be \$20 million per biennium instead of \$3 million. In addition, under the enhanced regulatory program (W-4), costs for state agencies will increase as more staff will be needed to provide technical assistance. Local government wetlands programs to meet Authority standards are likely to be supported through a multi-million dollar appropriation for implementation of the Growth Management Act, SHB 2929. More federal funding is expected to be available than in the past for the wetlands program.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Wetlands Protection

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
W-1 Criteria Dev. and Program Planning	\$21,466	\$122,662	\$53,657	\$35,772	\$35,772
W-2 Identif. of Wetlands to Preserve	\$171,809	\$9,806	\$356,872	\$329,310	\$329,310
W-3 Wetland Preservation	\$596,789	\$1,530,704 ²	\$20,807,065	\$20,759,798	\$20,759,798
W-4 Enhanced Regulatory Program	\$239,173	\$298,240	\$3,267,520	\$2,817,938	\$2,817,938
W-5 Interagency Coordination and the Federal Role	\$0	\$1,605,700	\$421,534	\$271,534	\$271,534
W-6 Program for State-owned Lands	\$28,496	\$5,704	\$340,472	\$314,436	\$354,507
W-7 Wetlands Education Strategy ³	\$0	\$37,000	\$20,000	\$0	\$0
W-8 Wetlands Restoration Program	\$0	\$0	\$721,043	\$286,168	\$286,168

TOTALS	\$1,057,733	\$3,609,816	\$25,988,163	\$24,814,956	\$24,855,027
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BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Aquatic Lands Enhancement Account ⁴	\$0	\$1,525,000	\$0	\$0	\$0
State Capital Funds	\$500,000	\$0	\$20,000,000	\$20,000,000	\$20,000,000
Centennial Clean Water Account	\$0	\$1,200,000	\$1,800,000	\$1,200,000	\$1,200,000
Federal Funding Sources	\$0	\$111,864	\$331,198	\$181,198	\$181,198
Local Funding Sources	\$0	\$399,996	\$500,000	\$400,000	\$400,000
Permit Fee	\$0	\$50,554	\$0	\$0	\$0
State General Fund	\$557,733	\$322,402	\$3,356,965	\$3,033,758	\$3,073,829
TOTALS	\$1,057,733	\$3,609,816	\$25,988,163	\$24,814,956	\$24,855,027

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Includes \$1,525,000 made available by DNR for wetlands acquisition and inventory as a one-time revenue source from the Aquatic Lands Enhancement Account.

³ Wetlands education is also funded under Education and Public Involvement element EPI-2.

⁴ These funds were made available by the Department of Natural Resources as a one-time revenue source for wetlands acquisition and inventory. This will not be repeated in future biennia.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Wetlands Protection

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$0	\$0	\$32,500	\$32,500	\$32,500
Bureau of Land Management	\$0	\$0	\$13,000	\$13,000	\$13,000
U.S. Army Corps of Engineers	\$0	\$0	\$58,726	\$58,726	\$58,726
Department of Community Development	\$0	\$0	\$65,000	\$65,000	\$65,000
Department of Natural Resources	\$685,725	\$1,525,000 ²	\$21,034,967	\$20,955,776	\$20,995,847
Department of Ecology	\$325,620	\$394,082	\$1,866,194	\$1,638,312	\$1,638,312
EPA Region 10	\$0	\$0	\$208,726	\$58,726	\$58,726
U.S. Soil Conservation Service	\$0	\$0	\$13,000	\$13,000	\$13,000
Local Governments	\$0	\$1,626,996	\$2,300,000	\$1,600,000	\$1,600,000
National Marine Fisheries Service	\$0	\$0	\$13,000	\$13,000	\$13,000
National Oceanic and Atmospheric Admin.	\$0	\$0	\$13,000	\$13,000	\$13,000
Puget Sound Water Quality Authority	\$25,048	\$29,224	\$158,046	\$158,046	\$158,046
Tribal Governments	\$0	\$10,000	\$0	\$0	\$0
U.S. Forest Service	\$0	\$0	\$11,746	\$11,746	\$11,746
U.S. Fish and Wildlife Service	\$0	\$0	\$58,726	\$58,726	\$58,726
Department of Fisheries	\$9,340	\$0	\$67,552	\$61,618	\$61,618
Department of Wildlife	\$12,000	\$24,514	\$73,980	\$63,780	\$63,780
TOTALS	\$1,057,733	\$3,609,816	\$25,988,163	\$24,814,956	\$24,855,027

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Includes \$1,525,000 made available by DNR for wetlands acquisition and inventory as a one-time revenue source from the Aquatic Lands Enhancement Account.

MUNICIPAL AND INDUSTRIAL DISCHARGES PROGRAM

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INTRODUCTION

The Municipal and Industrial Discharges Program takes a comprehensive approach to improving the existing and very complex waste discharge permitting process. The purpose of the program is to achieve comprehensive improvement in the control of toxic and other pollutants discharged into Puget Sound by industrial and municipal dischargers, reducing and eventually eliminating harm from such contaminants entering or accumulating in the Sound.

PROBLEM DEFINITION

Environmental Problems

Industries and municipal sewage treatment plants release about 900 million gallons of wastewater to Puget Sound every day.¹ Municipal and industrial discharges of wastewater are often referred to as point sources of pollution because they are discharged into the water at a specified point such as a pipe or ditch.

Extensive and continuing efforts to control conventional pollutants² from point sources with wastewater discharge permits have proved increasingly successful, and water quality problems related to these pollutants are now relatively rare in Puget Sound.³

Toxic pollutants are of greater concern in Puget Sound. Of greatest concern are toxicants that are persistent (remaining in existence long enough to accumulate and cause harm) and those that are accumulated and concentrated in sediments and living tissues and passed through the food chain.

Many toxicants discharged by point sources bind to particles and settle out to become part of the sediment. The concentration of toxicants found in recent sediments from Puget Sound's urban bays is up to 100 times the levels in the cleanest rural bays. Toxicant concentrations in sediments from the central basin and rural bays are much lower but are still elevated over preindustrial levels. High concentrations of toxic contaminants have been associated with high incidence of diseased fish and other adverse biological effects in Puget Sound's urban bays. Toxic substances may also pose health risks to consumers of Puget Sound seafood.

As the population of the Puget Sound region continues to grow, increasing amounts of toxicants will be discharged to Puget Sound from municipal sewage treatment plants, industries, and storm drains unless efforts to reduce such discharges are greatly increased.

While many industries and municipal treatment plants that discharge directly to the Sound and its tributaries discharge significant quantities of toxicants, current effluent monitoring is insufficient to estimate accurately their contribution relative to other sources of toxicants such as stormwater, combined sewer overflows (CSOs), and nonpoint sources. It has been estimated that approximately half of toxics loading in Puget Sound is related to municipal and industrial point sources while the other half may be related to nonpoint types of sources such as stormwater, household hazardous waste, and agricultural runoff.

1 This volume would cover an area of 4.3 square miles to a depth of one foot. It is approximately equal to the average daily discharge of the Green/Duwamish River.

2 The federal Clean Water Act divided pollutants into categories with varying requirements. Conventional pollutants are oxygen-depleting substances, suspended solids, fecal coliform bacteria, pH, and oil and grease. Toxic pollutants include 13 heavy metals, 111 organic compounds (such as pesticides and polychlorinated biphenyls, or PCBs), asbestos, and cyanide. All other pollutants are classified as nonconventional pollutants.

3 Water quality problems related to conventional pollutants from point sources in Budd Inlet are an example of an exception to this generalization. Overflows from combined sewers are another exception. Where such problems do occur, they are generally localized and transient.

In cases where municipal treatment systems receive industrial discharges, these indirect discharges generally contribute a high proportion of the toxicants discharged by the treatment plant. These toxicants can interfere with the operation of the sewage treatment plant, expose plant workers or equipment to damaging substances, or pass through the treatment plant to contaminate the water, air, or sludge. Industrial pretreatment programs are designed to reduce such problems by removing the problem wastes before they enter the municipal wastewater.

Other significant sources of toxicants to Puget Sound include hazardous wastes discharged into municipal treatment plants from households and small businesses and commercial operations.

While toxic pollution of sediments has become a dominant concern, recent reports show that the sea surface may also be contaminated with toxicants in sufficient concentrations to kill or cripple larvae and fish eggs that come into contact with the microlayer. The water itself also sometimes shows concentrations of toxicants that exceed EPA's criteria for the protection of marine life from adverse chronic effects.

The rate of contamination of sediments by some highly regulated toxicants (e.g., lead, DDT, PCBs) is decreasing. However, the same cannot be said for all toxicants. As population and industrial activity increase, toxic contamination may become more severe. Because of the persistence of many toxic substances, the contamination is not easily reversed.

Institutional Problems

The federal Clean Water Act and Washington state law have established a strong institutional framework for controlling municipal and industrial discharges. Direct dischargers must obtain a National Pollutant Discharge Elimination System (NPDES) permit from the Department of Ecology (for non-federal facilities) or EPA (for federal facilities). Ecology also administers state waste discharge permits, which regulate discharges to sewers (and related pretreatment requirements) and to the ground. Ecology has been delegated authority to administer the pretreatment program, which regulates certain industrial and commercial discharges to sewers.

Under the point source control system, (1) a permit is required for any point source discharge; (2) the permit establishes specific limits on the quantity and concentration of contaminants allowed to be discharged (or on the overall toxicity of the effluent), together with other requirements (for monitoring, spill prevention, and others); (3) dischargers must monitor their effluent and report compliance with the conditions of the permit; and (4) the administering agency periodically inspects the facility and takes enforcement action as necessary. Effluent limits in permits must include minimum technology-based limits (generally based on criteria of Best Available Technology from federal law or all known, available, and reasonable methods of treatment from state law) plus more stringent limits where necessary to meet state water quality standards.

In the Authority's 1986 Municipal and Industrial Discharges issue paper, a number of weaknesses were identified in the implementation of the point source control system. While there have been many delays in Ecology's implementation of the program improvements, significant progress toward those improvements has occurred and continues to be made as a result of implementation of the 1987 and 1989 Puget Sound plans. These weaknesses and improvements to date include:

- Permits generally imposed very few limits on toxic chemicals (dissolved and particulate) either by limits on overall toxicity or on specific toxicants. *Current status:* Compared to historical conditions, there has been significant progress. Toxic limits have been considered during the development of all recent permit renewals for oil refineries, pulp and paper mills, and aluminum smelters, and some limits have been included in the permits. However, only a few municipal permits or other industrial permits include either toxic limits or monitoring improvements required by the plan. Some of the larger dischargers have taken steps to upgrade treatment systems and/or have implemented source controls to reduce toxicants. Several municipal treatment plants have made improvements in their pretreatment programs which have also helped to reduce the quantity of toxicants reaching Puget Sound. Local governments and the state have sponsored a number of important educational programs for small businesses and homeowners on the proper disposal of waste toxicants. These programs continue to gain popularity and make progress in reducing the quantity of toxics disposed to Puget Sound.
- EPA effluent guidelines did not cover all industries, waste streams within industries, or contaminants within waste streams. *Current status:* Although this is still the case, water-quality-based discharge limits and the requirements of the state permit writers manual are helping to close the gap.
- Permit writers often lacked sufficient information, guidelines, and standards to write toxicant limits in permits, and had to rely on best professional judgment in developing permit conditions. *Current status:* There has been substantial progress including the draft permit writers manual (about two-thirds complete) and permit writer training classes. Permits are beginning to reflect these improvements.
- Informal guidelines for mixing zones (a dilution zone where less stringent standards apply) did not take into consideration persistent toxicants and reconcentration of toxicants in sediments. *Current status:* A draft mixing zone rule has been developed.
- The scope of discharger self-monitoring was limited and did not detect problems in sediments. *Current status:* As permits are being renewed, self-monitoring requirements for sediment monitoring and biomonitoring are being included in most major industrial and some major municipal permits.
- Past enforcement has been weak and inconsistent. *Current status:* The dollar amounts of some recent penalties has increased and Ecology has drafted a revised enforcement policy, portions of which will be adopted by rule (element P-18). Efforts to upgrade the enforcement program continue.
- Felony provisions did not exist in state law for serious, intentional violations. *Current status:* This is still the case. The Authority submitted bills to establish felony provisions to three legislative sessions without success. The 1991 plan further clarifies the intent of this provision and calls for legislation to be resubmitted.
- Inspections were infrequent and were generally announced in advance. *Current status:* There has been progress in some types of inspections and some slippage in other types. In 1988 the frequency of walk-through inspections of major industrial dischargers reached 78 percent of the plan's inspection goal; in 1989 the frequency reached 102 percent. More comprehensive

industrial inspections reached 87 percent of the plan's goal in 1988 and 74 percent in 1989. For major municipal dischargers, inspections fell far short of the plan's goal at 52 percent in 1988 and 45 percent in 1989 for walk-through inspections and 29 percent in both 1988 and 1989 for more comprehensive inspections. Major inspections are still generally announced in advance either for a specific appointment or a particular week.

- There was no system to detect unpermitted discharges, except to a limited extent, in urban bays. *Current status:* There has been little change. The urban bay action teams have, in some cases, been very successful in identifying unpermitted dischargers. Ecology has formed an internal work group to develop a plan to identify other unpermitted dischargers.
- Self-monitoring was rarely independently verified. *Current status:* This is still the case, although inspections provide some verification.
- Laboratory data were sometimes inaccurate and unreliable. *Current status:* Recent performance evaluation samples indicate significant improvements at Ecology's Manchester laboratory. As of September 1990 the laboratory is producing accurate and precise results, within prescribed holding times, for a wide range of environmental variables.
- Municipal operator training was limited in scope; in particular, operators generally received little training related to pretreatment. *Current status:* The municipal operator certification test was updated to include questions related to pretreatment, and Ecology established a newsletter for operators that explains pretreatment program issues and updates.
- Public participation in permits and related decisions was limited. Comments that were received from citizens were often not useful because the citizens had no way to become familiar with issues. *Current status:* Fact sheets for the major industrial permits and a few other permits reflect significant improvements. For the remaining permits, the fact sheets do not yet reflect the information required in the permit writers manual.
- Ecology lacked adequate resources to effectively carry out its functions under the NPDES and pretreatment programs. *Current status:* With passage of Initiative 97 in 1988 and subsequent increased permit fees, substantial increases in funding for this program have resulted, although funding is still below Ecology's estimate of total program needs.

PROGRAM STATUS

There has been substantial progress in implementation of the program. The initial implementation was substantially delayed by serious budget constraints and resulting lack of resources. Legislation to increase discharge permit fees to provide additional resources failed during the 1987 regular legislative session. The legislature approved a permit fee increase to a cap level in a special session in October 1987. Initiative 97, approved by voters in November 1988, removed the cap and mandated that the permit program be self-supporting. The additional funding allowed progress in delayed elements, and activity has accelerated. Program delays and missed target dates have continued as Ecology has tried to assimilate the many program changes and to establish stability and improved accountability in the program before seeking increased funding in permit fees.

Ecology anticipates seeking regular and substantial increases to the permit fees as a result of recommendations of the Efficiency Commission. The Efficiency

Commission was formed by the governor's office to review programs of state agencies and recommend efficiency improvements. In early 1990, at the request of the director of Ecology, the Efficiency Commission created a study team review the wastewater discharge permit program and to permit fees and to make recommendations to improve efficiency. The Commission's final report was released in late 1990.

Ecology's 1988-1990 activities have emphasized (1) the development of criteria, guidance, and procedures necessary for setting new standards and improving permits; (2) initiation of more frequent sampling inspections for certain types of dischargers; (3) training of permit writers; (4) implementation of the new permit fee laws which will provide for program resources to be increased; and (5) management of major and very complex changes to the program.

Specific accomplishments include: adoption of water quality criteria for 22 toxicants as part of the state's water quality standards (P-1); drafting of sediment quality standards (P-2) and mixing zone rules (P-3); development of regulations to implement the increased discharge permit fees (P-4); release of the partially completed draft permit writers manual (P-5); development of interim guidelines for biomonitoring and toxicity control (P-8); and continued progress on the urban bay action teams (P-13) and the pretreatment program (P-22). Additional accomplishments include start-up of the lab accreditation program (P-16 and L-1), initiation of steps to upgrade the data management system (P-17), initiation of revisions to the enforcement policy (P-18), and additional training for permit writers (P-19) and municipal treatment plant operators (P-23).

Although initially delayed, crucial work to develop a permit writers procedures manual (P-5) and to write monitoring guidelines (P-8) is now nearing completion. Ecology has begun to make significant improvements in the requirements included in waste discharge permits (P-6 through P-10), particularly for major industrial permits. The improvements call for better monitoring and control of the release of toxicants—the essence of the municipal and industrial discharges program.

Enhancements to federal permits (P-11) and revisions to the major/minor permit allocation lists have not yet begun. EPA is re-evaluating the major/minor criteria (P-12), and no federal permits were issued in 1989. There has been some progress in conducting increased inspections (P-14).

Little progress has occurred on the information/education and self monitoring elements (P-15 and P-26). As a result of extensive discussions with affected groups, the Authority in February 1988 revised the municipal operator training element (P-23) to ease what was perceived as an unnecessarily onerous training requirement and to give greater discretion to the Wastewater Operator Certification Board. Little action took place on the industrial operator certification element (P-24) as funding was not available. No activity occurred to carry out the Employee Education Assistance element (P-25) due to lack of funding. Technical outreach to dischargers (P-27) was never funded and therefore was not started. The P-28 progress reporting task was not started.

PROGRAM GOAL

To achieve comprehensive improvement in the control of toxic and other pollutants discharged into Puget Sound by industrial and municipal dischargers, reducing and eventually eliminating harm from such contaminants entering or accumulating in the Sound.

STRATEGY

The strategy for achieving this goal is to (1) require that all waste discharge permits include appropriate monitoring requirements and limitations on toxicants and other pollutants of concern; (2) develop the tools needed to make these permit improvements, including the permit writers manual, data management, lab support, quality assurance, and technical assistance and training; (3) allocate substantially increased resources to urban bay action teams and pretreatment; (4) devote substantially increased resources to the inspection and enforcement of waste discharge permits for industrial and municipal discharges; and (5) discover and control unpermitted discharges.

PROGRAM ELEMENTS

Standards

P-1. Adopt EPA Water Quality Criteria

To assure better control of toxicants, Ecology shall adopt numerical water quality criteria which are relevant to Washington state and equivalent to those published in EPA's Quality Criteria for Water (for the protection of aquatic life). These criteria may be adopted by reference; if so, a summary of the criteria (including the numerical values) shall be appended to copies of the state water quality standards distributed by Ecology. As EPA adds toxicants or updates toxicant limits in its Quality Criteria for Water, Ecology shall similarly update the state water quality standards no later than the next triennial review of these standards as required under the federal Clean Water Act.

Target Date: Updates to be completed as appropriate for Ecology's June 30, 1991, triennial review and each subsequent triennial review.

[Status: Ecology adopted EPA's 1986 Quality Criteria for Water into state standards on January 5, 1988 (see WAC 173-201).]

P-2. Standards for Classifying Sediments Having Adverse Effects

Ecology shall develop and adopt by regulation standards for identifying and designating sediments that have acute or chronic adverse effects on biological resources or pose a significant health risk to humans. The sediment standards will establish the levels of sediment contamination that are acceptable throughout the Sound over the long term. The standards may use physical, chemical, and biological tests and shall clearly identify pass/fail standards for the prescribed tests. Because methodologies to assess the human health risks of chemical contamination of sediments are not well developed, the initial standards may deal only with adverse effects on biological resources. The standards shall be revised to incorporate information on human health risks as it becomes available. Ongoing work by EPA and the Puget Sound Dredged Disposal Analysis (PSDDA) to develop sediment quality values may be used as the technical basis for these standards.

Various technical and legal issues will be considered by Ecology during the development of these standards, including the selection of appropriate methods for measuring or predicting harm, the relationship of these standards to existing state and federal permit programs, and the possible need to allow sediment mixing (or impact) zones.

In developing these sediment standards, Ecology shall form an advisory committee which shall include representatives of environmental and public interest groups, ports, industry, appropriate state and federal agencies, and local and tribal governments.

The standards shall be reviewed and updated as necessary, at least every three years. If apparent effects threshold (AET) values are used as a basis for establishing the standards, the AET values shall be recomputed periodically to incorporate new data.

Ecology shall use these standards as the desired goal for sediment quality in implementing the municipal and industrial discharges program (see element P-7), the stormwater and CSOs program (see element SW-2), and the nonpoint program. These standards shall also be used as a basis to manage the disposal of dredged material (see elements S-3 and S-4), and to identify locations with sediment contamination (see elements S-7 and S-8). In implementing these programs, Ecology will consider other appropriate factors, including the availability and reasonableness of treatment and control methods. This consideration of other factors may prevent this goal from being achieved in the near term. In particular, municipal, industrial, CSO, and stormwater discharges may not initially be able to meet these standards without the application of sediment mixing (or impact) zones (see elements P-3 and P-6).

Sediments that exceed the sediment standards are undesirable in Puget Sound. When they are dredged, they may only be disposed of by meeting the requirements for use of PSDDA open water disposal sites (see element S-3) or the requirements for confined disposal to be developed under Sediments element S-4 (which may include in-water as well as upland disposal methods). Sediments that exceed the sediment standards shall not be used as cap material for dredged material disposal or remedial actions.

Ecology may determine that it is not cost-effective to cap, treat, or remove all sediments that exceed the standards developed under this element. Ecology may identify higher (more contaminated) levels that would result in cleanup actions or define cleanup levels (see Sediments element S-7).

Target Date: Final adoption of the initial standards shall be completed by June 30, 1990.

[Status: The Sediments Advisory Group was formed in August 1988. Ecology completed a number of technical studies and an issue paper addressing concerns raised by the Sediments Advisory Group. On December 4, 1989, Ecology issued an Interim Sediment Quality Evaluation Process for Puget Sound. This evaluation process served as interim sediment quality criteria. A proposed sediment standards rule was filed September 19, 1990, with the code reviser as part of the formal rulemaking process.]

P-3. Water Column and Sediment Mixing Zone Criteria

3.1. Water Column Mixing Zones

In order to provide adequate opportunity for public review and comment on the criteria governing water column mixing zones surrounding wastewater discharges, Ecology shall adopt administrative rules specifying criteria for estab-

lishment of mixing zones in municipal and industrial wastewater discharge permits as well as for stormwater outfalls. For municipal and industrial wastewater discharges, the draft rule shall incorporate the concepts that mixing zones: are not assumed as a given use of public resources; are initially as small as feasible and decrease in size appropriately as technology evolves; and are granted because there is demonstration of overriding public benefit by allowing this use of a public resource. In developing the stormwater mixing zone criteria, Ecology shall include criteria that reduce the impact of these discharges to the maximum extent practicable. Mixing zone provisions shall not be changed during the term of the permit except as may be necessary to comply with water quality standards.

3.2. Sediment Impact Zones

Ecology shall develop specific criteria for establishing sediment impact zones that shall include provisions for interim management and closure plans, where appropriate, and adopt the criteria as an administrative rule. These criteria shall be developed for municipal and industrial discharges as well as for stormwater outfalls.

For municipal and industrial wastewater discharges, the draft rule shall incorporate the concepts that mixing zones: are not assumed as a given use of public resources; are initially as small as feasible and decrease in size appropriately as technology improves; and are granted because there is demonstration of overriding public benefit by allowing this use of a public resource. In developing the impact zone rule pertaining to stormwater discharges, Ecology shall also include criteria consistent with the stormwater program that reduce the impact of these discharges to the maximum extent practicable.

Target Date: 3.1: Final adoption of water column dilution mixing zone rules (including special provisions for stormwater) by June 30, 1991. 3.2: Final adoption of sediment impact/recovery zone rule by June 30, 1990.

[Status: Staff was hired in spring 1988 to begin developing the water column mixing zone rule. Internal and external advisory committees were formed and helped to develop a draft rule for trial use in permits until the final rule is adopted. Rules for the sediment mixing zones (termed sediment impact or sediment recovery zones) are being developed as part of the sediment standards rule (P-2). Ecology has completed several consultant studies and identified computer models to be used in designing sediment impact zones. A proposed sediment standards rule which includes sediment impact zones was filed with the code reviser in September 1990 to initiate the formal rulemaking process.]

Permits

P-4. Discharger Fees

4.1. Revised Permit Fee Rule

Ecology shall update and revise as appropriate the permit fees assessed on all permitted dischargers (including industrial, municipal, and federal) pursuant to RCW 90.48.465 and WAC 173-224. As specified in RCW 90.48.465, fees shall be established in amounts to fully recover and not to exceed expenses incurred by Ecology in processing permit applications and modifications, monitoring and evaluating compliance with permits, conducting inspections, securing laboratory analysis of samples taken during inspections, reviewing plans and documents directly related to operations of permittees, overseeing performance of

delegated pretreatment programs, and supporting the overhead expenses that are directly related to these activities. Ecology shall ensure that indirect dischargers do not pay twice for the administrative expense of a permit.

Ecology shall evaluate the adequacy of funding for municipal and industrial permits, review the municipal fee cap, and make recommendations, if appropriate, to address any shortfalls. Ecology shall also consider the economic impact of fees on small dischargers and the economic impact of fees on public entities required to obtain permits for stormwater runoff and shall make appropriate adjustments.

4.2. Variable Permit Fee Study

Ecology shall submit to the Authority a study of the feasibility of establishing a variable permit fee based on the quantity, toxicity, persistence, and other characteristics of the effluent. A variable component of the permit fee would, to the maximum extent possible, create an incentive for dischargers to reduce the quantity and harmful characteristics of their effluent. The variable permit fee study should consider establishing higher fees for dischargers that have mixing zones authorized in their permits.

4.3. Efficiency Report

Ecology shall incorporate appropriate recommendations of the Governor's Efficiency Commission or take other appropriate steps to ensure that the permit fees levied are efficiently utilized and fully accounted for. Ecology shall provide the Authority copies of its reports to the Efficiency Commission. The Authority shall review the final report of the Efficiency Commission and consider revising the plan as appropriate.

4.4. Aquatic Lands Leasing Rate

The Authority encourages the Department of Natural Resources to review aquatic lands leasing policies and laws as they relate to contamination of state-owned aquatic land. The purpose of the review is to determine whether changes in laws or policies might provide better proprietary management of historical and current particulate contamination and allow for proper compensation to the state for storage of that material on state-owned aquatic lands. In developing any changes to the leasing program, affected groups including ports, municipal and industrial discharges, and stormwater dischargers shall be consulted.

Target Date: 4.1: Ecology adopts revised permit fee rule to fully recover fee-eligible costs by June 30, 1991. 4.2: Ecology submits feasibility study of the variable charge by December 31, 1995, and implements it by June 30, 1997. 4.3: Ecology submits efficiency reports per schedule set by Efficiency Commission. 4.4: Authority encourages DNR to review the aquatic lands leasing program by December 31, 1993.

[Status: Permit fee legislation was enacted in October 1987 that included a \$3.6 million per year statewide permit fee cap (RCW 90.48.600 through 90.48.640). This was subsequently repealed by the November 1988 passage of Initiative 97 (RCW 90.48.465) which removed the cap and directed that permit fees fully recover expenses related to the permit program. Ecology adopted a revised permit fee rule (WAC 173-224) which recovered \$3.6 million per year (approximately half of the fee-eligible statewide costs). A draft variable fee study was issued for review in March 1990. The state Efficiency Commission issued their report on November 14, 1990.]

P-5. Permit Writers Manual, Permit Quality Control, and Internal Technical Assistance for Permit Writers

Several comprehensive policies must be implemented to ensure overall coordination and quality assurance of the permit program. In order to fulfill this objective, Ecology shall build upon existing efforts and establish a centralized mechanism which ensures: (1) development of consistent policies and communication of them to all Puget Sound basin permit writers; (2) implementation of permit quality assurance reviews prior to issuance; (3) coordination and resolution of cross-program issues; (4) acceptance of permit applications from dischargers only if they are fully complete; and (5) equally stringent requirements for municipal and industrial permits to the extent practicable.

5.1. Permit Writers Manual and Checklist

Ecology shall complete and thereafter revise as necessary a procedures manual for permit writers (referred to as the permit writers manual). In preparing all NPDES permits in the Puget Sound basin, permit writers shall use the permit writers manual.

This manual shall include examples, guidelines, and procedures to ensure that all pertinent information is made available and used by permit writers in determining appropriate effluent limits, particulate contamination limits (see P-7), source control measures, monitoring schemes, best professional judgment, fact sheets, and other conditions in NPDES and state permits. Such information may be derived from documents already available to the department (e.g., the applicant's most recent hazardous waste annual reports) or additional information that would be requested from the applicant (e.g., information on the overall distribution of contaminants between the dissolved and suspended phases of the effluent).

The procedures manual shall require that all NPDES permits include appropriate conditions addressing all stormwater runoff from permitted facilities. Procedures for coordination of permits with the urban bay action plans (see P-13) shall also be included. The permits shall also address any significant issues raised in the fact sheet (see P-6.2).

The procedures manual shall incorporate other requirements of this plan related to permit writing, including water quality and sediment standards (P-1, P-2), enhanced information in public notices and fact sheets pertaining to draft permits (P-6), particulates and solids (P-7), monitoring requirements including provisions for tiering (P-8), spill control (P-9), explanation of changes in discharge limitations (P-10), 401 certifications (P-11), assuring inspection access, assuring that inspection results are provided to permit writers and permit modifications are made if necessary (P-14), and pretreatment program enhancements (P-22). The procedures manual shall encourage Ecology staff to make the best possible use of municipal and industrial expertise and resources in carrying out permit writing and appropriate related activities.

The procedures manual shall also include guidelines for permit writers to use in evaluating the potential for cross-media transfer of pollutants. These guidelines shall emphasize mechanisms available to permit writers to encourage waste reduction at the source rather than end-of-pipe treatment if such treatment results in cross-media transfer of pollution. Ecology is encouraged to develop such effluent guidelines and technical standards as may be necessary to assist in the efficient administration of the permit program.

Ecology shall provide opportunity for the public to review and comment on the draft procedures manual and any significant updates to it.

A checklist shall accompany each public draft and final issued permit. The checklist shall document that all appropriate requirements of the Puget Sound plan were met and procedures in the permit writers manual were followed during preparation of the permit.

5.2. Technical Assistance and Quality Control

Ecology shall establish an internal technical assistance team to assist permit writers in researching and writing appropriate conditions for NPDES and state permits. Ecology shall build upon initial efforts and develop a comprehensive permit quality control and internal technical assistance plan.

5.3. Inspector's Manual

Ecology shall prepare and update as necessary an inspector's manual which shall incorporate all appropriate components of this plan and shall make use of existing manuals, such as those published by the U.S. Environmental Protection Agency, to the maximum extent possible.

5.4. Permit Review

The Washington Departments of Natural Resources, Health, Fisheries, and Wildlife, appropriate federal agencies, and tribal governments shall review and comment on selected NPDES permits with regard to protecting the respective resources for which they have responsibility. Ecology shall provide training for these departments upon request for the purpose of reviewing permits (see P-26).

5.5. NPDES Rule Revision

Ecology shall revise the rules governing NPDES permits (WAC 173-220) to include the plan's permit improvements as appropriate.

Target Dates: 5.1: Complete final permit writer's procedures manual, incorporating changes required by the Puget Sound plan by June 30, 1991, and update as necessary thereafter. Develop final chapters for permit writers manual on chronic biomonitoring and monitoring-based effluent limits by May 30, 1990. In the interim, Ecology shall use EPA's chronic biomonitoring guidance in NPDES permits. 5.2: Complete and submit to the Authority for approval the comprehensive permit quality control and internal technical assistance plan by June 30, 1991. Complete implementation by June 30, 1992. 5.3: Complete inspector's manual by June 30, 1992. 5.4: Agencies and tribal governments initiate review of permits by December 31, 1991. 5.5: Revise NPDES rule by June 30, 1993.

[Status: Ecology has initiated efforts to achieve some of the permit program coordination and quality assurance objectives, particularly with regard to sediments. The original permit manual target date of December 31, 1988, was not met but a two-thirds draft manual was completed by June 30, 1989. The sections addressing monitoring, application of sediment standards, stormwater permitting, and external advisory committee comments have not yet been completed. Ecology has established an internal permit quality control review team which selectively reviews permits after they have been issued. A draft inspector's manual is two-thirds completed.]

P-6. Toxicant Effluent Limits in Permits

6.1. Discharge Limits

The objective of toxicant effluent limits in permits is to control through the use of all known, available, and reasonable methods of treatment ⁴ the sources of toxicants in wastewater discharges. In issuing or reissuing NPDES or state waste discharge permits, Ecology permit writers shall follow the procedures set out in the permit procedures manual developed under element P-5 and shall review the dischargers' operations and incorporate permit conditions which require all known, available, and reasonable methods to control toxicants in the dischargers' wastewater. Such conditions may include, but are not limited to, limits on the discharge of specific chemicals and/or limits on the overall toxicity of the effluent. The toxicity of the effluent shall be determined by techniques such as chronic or acute bioassays. Such conditions shall be required regardless of the quality of receiving water and regardless of the minimum water quality standards. In no event shall the discharge of toxicants be allowed that would violate any water quality standard, including toxicant standards, sediment criteria, and mixing zone criteria.

Wastewater discharge permits shall have quantitative discharge limits for all toxicants present in significant amounts. ⁵ At a minimum, discharge limits, including an appropriate mixing zone, shall be established for all toxicants which would exceed applicable ambient water quality standards at the end of the pipe (based on all known, available and reasonable methods, of treatment, AKART). Similarly, discharge limits, including a mixing zone, if appropriate, shall be established if monitoring results show that applicable ambient water quality standards are exceeded at the end of the pipe based on AKART.

Permit writers shall take into consideration, subject to Ecology policy, the background levels of pollutants in setting discharge limits. For stormwater runoff, Ecology shall determine appropriate discharge limits which are based on best management practices implemented to the maximum extent practicable and consistent with state and federal law.

6.2. Fact Sheets and Public Involvement

The objective of enhancing the fact sheets is to facilitate meaningful public review. In the fact sheet accompanying each draft major permit, Ecology shall clearly explain how the draft permit fulfills the goal of reducing and eventually eliminating harm from toxic contaminants in Puget Sound, including a summary of the information used to determine which limits on specific toxicants and/or overall effluent toxicity should be included in the permit (see also element P-28, Reporting Requirements). It is the Authority's intent that the fact sheet information be as concise, consistently presented, and efficiently prepared as possible,

⁴ Ecology has considered the following criteria, among others, in determining reasonable methods: (1) status of planning needed to proceed with the proposed method, (2) environmental or siting constraints, and (3) economic factors. The Pollution Control Hearings Board has upheld Ecology's use of these criteria and confirmed that water quality considerations are irrelevant to the selection of the technology to be imposed (see PCHB Nos. 84-178, 84-206, 84-211).

⁵ Significant amounts may be determined from the permit application or monitoring results, or may be expected from land use types, pretreatment evaluations, best professional judgment, technical literature, and sediment, water quality, or ambient environmental problems.

making use of computerized information, and focusing on the issues addressed in this program. Fact sheets shall be written in language which can be understood by the lay public.

Ecology shall ensure that the dischargers and the public have equal opportunity for access to and involvement in the permit decisions pertaining to discharge limits, mixing zones, monitoring schemes, or other negotiable requirements of the permits.

EPA shall provide a similar explanation for any draft major permit issued by EPA.

Target Date: 6.1 and 6.2: Ongoing, with full implementation by June 30, 1992.

[Status: Language similar to the first paragraph of this element was enacted by the 1987 legislature and is now RCW 90.48.520. Implementation was delayed due to delays in the permit procedures manual (P-5). Toxicant limitations are now being considered in most major industrial permits and some toxic limits are required. Few major municipal permits consider or require toxics limits. Future toxicant limits may result from the new monitoring requirements now being included in many major permits. There has been substantial improvement in the fact sheets for many major permits. However, additional improvements are needed for the fact sheets to be fully effective.]

P-7. Particulate Effluent Limits and Solids Handling

7.1. Particulate Effluent Limits

In issuing or reissuing NPDES permits, Ecology shall obtain and review information on particulate contamination in the applicant's effluent (or similar data for comparable effluents) and shall include specific conditions on particulate contamination, appropriate to each case, sufficient to assure that the ambient sediment standards will not be violated, subject to any authorized sediment impact or mixing zones. Such conditions may include source control measures, best management practices, numeric limits on toxicity of the particulate fraction of the effluent, numeric limits on the concentration or mass of specific chemicals discharged, or other conditions deemed appropriate by Ecology. However, permittees shall not be required to comply with conditions for which there is no appropriate laboratory protocol, as determined by Ecology. Once appropriate protocols have been determined by Ecology and referenced in the permit writers manual, thereafter any draft of a major permit proposed without conditions on particulate contamination shall include in the accompanying fact sheet a written explanation of reasons why such conditions are not applicable to the specific discharger (see also element P-28, Reporting Requirements).

EPA shall carry out this element with respect to every NPDES permit issued by EPA in the Puget Sound basin (see also element P-11).

7.2. Solids Handling and Disposal

NPDES, pretreatment, and federal facilities permits shall include solids handling and disposal plans which prevent pass-through of excessive solids. For municipal permits, these plans shall also address disposal of solids generated from cleaning out sanitary and combined sewer collection systems. Stormwater

permits (including general or group permits) shall include solids handling and disposal plans for maintenance and cleaning.

Ecology shall evaluate the current disposal mechanisms, laws, policies, and issues relating to municipal and industrial dischargers' sludge and solid by-products and prepare a report to ensure proper handling of these materials. In preparing the report, Ecology shall involve local governments and other interested parties. The report shall address: (a) municipal sludge; (b) pretreatment sludges; (c) land disposal of contaminated sediments (see element S-5); (d) stormwater drainage system maintenance solids (see elements SW-4 and SW-5); (e) changes needed to implement the new federal municipal sludge regulations; (f) changes needed to state statutes and rules; (g) coordination with the NPDES, pretreatment, and stormwater permitting programs; (h) technical assistance to landfill permitting authorities and NPDES and pretreatment permit writers; and (i) adequately overseeing and enforcing proper solid waste disposal.

Target Date: 7.1: This element shall be implemented by June 30, 1992. 7.2: Submit report to Authority by June 30, 1992. Continue phasing into permits and complete by June 30, 1995.

[Status: Ecology has begun investigating centrifuge, modeling, and sediment trap technology as methods of evaluating the contamination of particulates in effluent. Implementation of particulate effluent limits has not started. Ecology has also begun developing a plan to address changes in the federal municipal sludge disposal requirements.]

P-8. Monitoring Requirements in Permits

In issuing, modifying, or reissuing NPDES permits (municipal, industrial, and stormwater), Ecology shall consider the need for each of the five types of monitoring listed below and shall include requirements in permits for all types of monitoring that are appropriate to each permittee. Monitoring requirements included in permits shall be tiered so that if initial (baseline) sampling discloses no problems, a reduced monitoring schedule may then apply. Likewise, if initial (baseline) sampling indicates the possibility of problems, a more frequent and/or more comprehensive monitoring schedule would apply. Initial monitoring schemes shall be set to ensure that enough data is collected to determine if additional discharge limits should be set.

Ecology shall develop (and revise as necessary) guidelines for the frequency and methodology of these tests and for reporting requirements and format. The guidelines shall include the tiered approach described above.

The guidelines shall focus dischargers' monitoring resources on the mandatory monitoring of effluent and the receiving environment and leave most of the in-plant process control monitoring to the discretion of the discharger except in cases of significant non-compliance, as necessary to meet permit effluent limits. Ecology shall minimize the mandatory in-plant process control monitoring to only what is necessary to verify that the appropriate technology is being used and to characterize influents as appropriate.

The guidelines shall use the Puget Sound protocols when available and data management systems compatible with the Puget Sound Ambient Monitoring Program. The guidelines shall also define triggers for determining when action is necessary to modify a permit. Ecology shall develop the guidelines in consultation with municipal and industrial dischargers, laboratories, EPA, the Authority, and others as appropriate.

In order to provide an opportunity for meaningful public review, monitoring requirements shall be fully described in the draft permit.

The fact sheet accompanying each draft major permit shall include a brief discussion of how the draft permit has dealt with each of the five types of monitoring specified below and shall explain those situations where any of these types of monitoring have not been required or otherwise addressed in the draft permit. Although these monitoring requirements shall be primarily directed toward the detection of impacts from individual wastewater discharges, as a second priority, and to the extent practicable, Ecology shall develop monitoring requirements for permits that will facilitate the calculation of the total quantity of contaminants discharged to Puget Sound.

The five types of monitoring are as follows:

1. Monitor specified parameters in the sediment in the vicinity of every significant outfall;
2. Separately analyze samples of the particulate fraction of the effluent from each significant outfall;
3. Conduct periodic acute and chronic toxicity bioassays on a sample of the effluent from each outfall and on the sediment near each outfall;
4. Conduct periodic surveys of the population, species composition, and health of biota in the vicinity of each significant outfall; and
5. Monitor water quality at the boundary of the mixing zone. Mixing zone modeling may suffice, provided that appropriate field verification determined by Ecology is carried out.

All major municipal dischargers shall perform priority pollutant scan analyses on their effluent at least annually and more frequently if appropriate. The permit writer may exclude groups of chemicals (e.g., pesticides) from the priority pollutant scan requirements of discharges with a capacity less than five million gallons per day, if there is recent monitoring data or literature documenting that the particular group of chemicals is not of concern for that discharge.

If, for a given test, Ecology finds that there is no analytical protocol reasonably available, or if there is no public or private laboratory capability to carry out the test, Ecology may suspend the testing requirement for that test until such time as such a protocol and/or laboratory capability becomes available. Ecology shall promote the development of protocols and laboratory capability in cases where these are not available for the types of monitoring tests listed above (see also Laboratory Support elements L-1 and L-2). If a discharger believes there is no protocol reasonably available, they may request a review of it by Ecology. Ecology shall then report the results of the review to the Authority.

Ecology, in cooperation with EPA, shall prepare a list of the highest priority permits (based on the probability of effluent containing a significant quantity of toxic pollutants of concern) to be reopened prior to expiration for inclusion of these monitoring requirements. Ecology shall submit this list to the Authority together with a schedule for completion of permit modifications to include these requirements.

Every major and minor permit issued or reissued by Ecology before the monitoring guidelines are implemented shall include a reopener provision allowing the



modification of the permit to incorporate monitoring requirements in accordance with this element. Every permit issued or reissued by Ecology shall include a reopener clause allowing Ecology to modify, based on monitoring results or other causes consistent with state and federal regulations, the effluent limitations, monitoring requirements, or other conditions in the permit. EPA shall include similar reopener provisions in every NPDES permit issued by EPA in the Puget Sound basin.

Ecology shall submit a report to the Authority on the advisability of providing an option B in which Ecology would arrange for an independent organization to conduct some or all of the monitoring activities (especially those involving sampling outside the effluent pipes—e.g., 1, 4, and 5 above) for some dischargers in lieu of the individual dischargers performing this monitoring themselves, to be funded by a surcharge on the NPDES permit fee paid by these dischargers. The study shall estimate the amount of the fee surcharge that would be necessary to support this alternative and whether the overall cost to dischargers would be reduced. The study shall also address whether the quality of information derived under such an alternative would be improved. This study shall not be construed as authorizing any delay in the implementation of the monitoring requirements described in this element.

Target Dates: Include reopener language in all permits issued or reissued after March 31, 1987. Complete monitoring guidelines by December 31, 1988. Submit report on option B by June 30, 1992. Continue to phase in inclusion of monitoring requirements in permits issued or reissued after December 31, 1988, and complete the phase in implementation by June 30, 1992. Submit list of high priority permits and schedule for completing modifications by June 30, 1992. Review the monitoring guidelines and update as necessary by June 30, 1991, and annually thereafter.

[Status: Monitoring guidelines were delayed. Reopener language is now routinely included in permits. Many major discharge permits now include additional monitoring requirements. The option B report has not been started and Ecology is discussing other options with the Authority. The list of high-priority permits has been started but not submitted.]

P-9. Spill Control Plans Required

Every major permit issued or reissued, and minor permits as appropriate, shall include conditions requiring the development or updating of spill control plans. At a minimum, such plans shall apply to both oil and hazardous substances. Ecology, in consultation with EPA, shall actively review and comment on the plans and shall require the permittee to implement the approved plan. Spill plans shall include the provisions of WAC 173-303-630 regarding secondary containment.

Consistent with other state and federal requirements, Ecology shall: track and improve requirements in dischargers' spill control plans; follow up on and improve upon dischargers' compliance with spill control plans; and ensure adequate staff to perform on-site compliance inspections for spill control plans and to update spill control plans in permits as appropriate.

Ecology shall take enforcement action, consistent with its enforcement guidelines, against any permittee found out of compliance with its spill control plan (refer to Spill Prevention and Response Program).

Target Date: Begin implementation by March 31, 1988. Ecology shall phase in incorporation of improved spill control plans into new and revised permits by June 30, 1992.

[Status: Many major permits already include basic spill control provisions; improved spill control plans are needed. Implementation and follow-up are not complete and not consistent across Ecology regional offices.]

P-10. Explanation of Relaxed and Increased Limits in Permits

For any draft permit whose effluent limitations are in any way less stringent than those in the preceding permit, Ecology shall include a conspicuous notice and clear explanation of the reasons for such limits in the public notice of the draft permit. This requirement shall apply to all effluent limitations that are, or appear to be, a relaxation of limits in comparison to the previous permit. This requirement for notice and written explanation shall also apply to any draft permit proposing to allow a greater amount of effluent to be discharged due to increases in production. In every such explanation, Ecology shall report on measures available to and undertaken by the discharger to reduce the production of pollutants per unit of product. Ecology shall adopt rules implementing this program element. (See also element P-28, Reporting Requirements.)

Target Dates: Begin notice and explanation process by March 31, 1987. Adopt final rules when the NPDES permit rule (WAC 173-220) is revised by December 31, 1992.

[Status: Guidance to Ecology permit writers to implement this element was issued on schedule. Due to lack of a reporting mechanism it is unclear whether the notice requirement is being implemented in applicable cases. The Authority's spot checking of permits indicates this effort has begun in very few applicable permits.]

P-11. Enhanced Requirements for EPA-Issued Permits/Ecology Certifications

11.1. EPA-Issued Permits

The Environmental Protection Agency shall include conditions in EPA-issued permits in the Puget Sound region at least as stringent as those that are required under this plan in permits issued by Ecology. This applies to all toxicant and particulate limits and to monitoring, spill control, frequency of inspection, and public notice requirements. EPA shall also review existing EPA-issued permits and modify any permit as necessary to include such limits and requirements.

11.2. Ecology Certifications

Ecology shall not issue an NPDES permit, nor certify the issuance or renewal of any NPDES permit for a federal facility under Section 401 of the Clean Water Act, unless the permit includes numeric limits and other conditions required to comply with all applicable water quality and sediment standards and other elements of this plan. Before considering a permit or 401 certification for a federal facility permit, Ecology shall seek to be familiar with the facility site, through site visits, inspections, or other means.

Target Date: This element shall be applied to Ecology 401 certifications in a phased manner, beginning April 30, 1988. All appropriate guidance from the permit procedures manual (P-5), monitoring guidelines (P-8), and sediment standards (P-2) shall be used as those products are completed.

[Status: Not started. Implementation was delayed pending completion of permit procedures manual, monitoring guidelines, and sediment standards. There have been no federal facility permits issued since the 1989 plan was adopted.]

P-12. Reevaluate Allocation of Permits into Major/Minor Categories

EPA shall give special consideration to early completion of its reevaluation of the major/minor permit classification for permits in the Puget Sound basin. Ecology shall communicate to EPA any discrepancies it is aware of in the classification of permits in the Puget Sound basin. As soon as is feasible, Ecology shall use its discretionary authority to reclassify minor dischargers to majors where appropriate and upgrade their permits, along with EPA reclassified majors.

Target Date: Complete upgrading of reclassified major permits by June 30, 1996.

[Status: Delayed at the national level.]

Compliance Assurance

P-13. Urban Bay Action Teams (UBATs)

The Authority recognizes the urban bay approach as an essential part of a comprehensive strategy to control sources of toxic pollution and requests EPA to continue providing resources for the urban bay programs. Additional support for the sediment-related tasks of the UBATs is contained in the Contaminated Sediments and Dredging Program element S-8.

Ecology shall submit to the Authority a UBAT long-term implementation plan which addresses:

- Criteria (consistent with element S-8) for identifying areas of Puget Sound where additional urban bay programs are warranted;
- Criteria for setting priorities among and within each UBAT for resources (staff, lab support, contractor support, etc.);
- Criteria for determining when a goal has been met (i.e., when source control is complete, when transition to sediment cleanup is appropriate, etc.) and evaluating (on a bay-by-bay basis) overall effectiveness;
- Procedures for obtaining public participation in the preparation of action plans;
- Coordination with other Ecology programs, and other state agencies such as Health and Parks;
- Procedures for gaining the concurrence and commitment of all appropriate groups (federal and state agencies, local and tribal governments, citizens, environmental, business, etc.) consistent with element PI-1.1, involved in

the implementation of the action plan, including a description of the approval process; and

- Determination of general milestones and success criteria of urban bay programs along with an implementation schedule for the long-range plan.

The Authority recognizes that UBAT programs are in progress, and intends that these programs not be delayed by the preparation of the long-term implementation plan.

For each area where an urban bay program is undertaken, an urban bay action plan shall be prepared that describes the condition and problems in the study area and contains an integrated program of actions to be undertaken by federal and state agencies, local and tribal governments, and dischargers, to solve problems (see also element S-8.4). Federal and state agencies and local and tribal governments shall implement their piece of the adopted UBAT plans. Each urban bay action plan shall be reviewed by the Puget Sound Estuary Program Management Committee, and following such review, the plan shall be transmitted to the Authority. Ecology shall report on the progress of the UBAT programs in the written and verbal reports required in P-28.

Ecology shall track progress toward implementation of each UBAT program, and ensure coordination and consistent implementation among the programs. UBAT coordination shall include evaluation and resolution of barriers to success of the UBATs.

Target Dates: Submit UBAT long-term implementation plan to the Authority June 30, 1991 and each urban bay action plan to the PSEP Management Committee when completed.

[Status: With substantial efforts and cooperation among EPA, Ecology, local governments, and interested citizens and business groups, urban bay action teams have completed plans for Elliott Bay, Commencement Bay, Sinclair/Dyes Inlet, and Everett Harbor. Teams are nearing completion of plans in Bellingham Bay and Budd Inlet. An interim action plan has been completed for Lake Union/Ship Canal. Implementation has been started in some bays with significant results (including successful EPA and Ecology efforts to negotiate implementation with military facilities). In other bays, implementation has been delayed or inconsistent. Ecology has begun an overall UBAT plan.]

P-14. Inspections

Ecology shall conduct a significant number of class I inspections⁶ on an unannounced basis. Similarly, a significant number of class II inspections shall include an unannounced sampling visit. Ecology shall assure that appropriate permits include such conditions as may be necessary to provide a prearranged means for Ecology inspectors to obtain unannounced samples of effluent on a 24-hour basis.

⁶ Class I inspections are walk-through inspections, including a visual inspection of the facility and some examination of records (self-monitoring reports, procedures manuals, operation and maintenance records, etc.). Class II inspections include all of the Class I activities plus effluent and some sediment sampling and analyses to determine compliance with the permit.

Ecology shall conduct inspections in accordance with the following minimum schedule:

Type of permit	Number of inspections per year per permit	
	Class I	Class II
Major	2	1
Significant minor	1	0.5
State and minor NPDES	1	0.1

Additional inspections (both announced and unannounced) shall be conducted based on the permittee's record of compliance. Ecology is encouraged to frequently perform quick surprise walk-through visits where a grab sample of the effluent is taken and obvious permit violations are addressed on the spot. Ecology inspectors shall ensure that they notify dischargers prior to leaving the facility of any obvious permit violations and any immediate corrective actions required. Ecology shall also ensure that copies of the results of the inspections reports (including lab data, see element P-16) are sent to permit writers and the dischargers within 90 days of the inspection date for Class I inspections and within 120 days for Class II inspections. Ecology shall ensure that discharge permits are modified as necessary to incorporate appropriate monitoring requirements, effluent limits, or other conditions to correct problems identified through inspections.

In conjunction with reporting requirements under element P-28, Ecology shall submit a report to the Authority on the number and types of inspections (including unannounced inspections) undertaken. The report shall also describe a system for tracking inspection information, including the number and type of inspections (including unannounced inspections), inspection results, the number and type of violations discovered, actions initiated in response to violations, lab data and inspection report turnaround times, and occasions on which an authorized inspector was denied access to a facility.

Target Date: Establish an inspection tracking system by June 30, 1991. Complete phase-in by June 30, 1994. Implement turnaround by June 30, 1993.

[Status: Actual numbers of phased-in inspection increases (data provided by Ecology) have been well below the goals for municipal dischargers while industrial inspections have met or nearly met the goals. Policies for unannounced class I inspections have been developed. Policies for unannounced class II inspections still must be evaluated. A tracking system is being developed under P-17. The number of actual inspections performed compared to the goals required by the plan are shown below:]

Class II inspections of major dischargers in Puget Sound with the goal/percentage of goal achieved noted in parentheses:

YEAR	MUNICIPAL	INDUSTRIAL
1987	2 (28/ 7%)	18 (23/ 78%)
1988	8 (28/ 29%)	20 (23/ 87%)
1989	8 (28/ 29%)	17 (23/ 74%)

Class I inspections of major dischargers in Puget Sound:

YEAR	MUNICIPAL	INDUSTRIAL
1987	52 (56/ 93%)	39 (46/ 85%)
1988	29 (56/ 52%)	36 (46/ 78%)
1989	25 (56/ 45%)	47 (46/ 102%)

Firm data for the other types of inspections were not available.]

P-15. Study of Independent Verification of Self-Monitoring

Ecology shall submit to the Authority the results of a study evaluating alternative methods of carrying out independent verification of self-monitoring reports submitted by dischargers, together with Ecology's proposed plan, schedule, and estimated costs for implementing a verification program. Possible methods to be evaluated may include combining the independent verification function with the quality assurance/quality control procedures contemplated under the laboratory certification program (see elements L-1 and P-16) and also option B in element P-8.

Target Date: Submit plan by December 31, 1995; implement plan by June 30, 1996.

[Status: Not funded; no activity during 1989-91 biennium.]

P-16. Lab Support and Certified Labs for Self-Monitoring

Ecology shall ensure that its own laboratory adheres to the Quality Assurance Management Plan described in element L-4.1 and provides timely turnaround of samples to inspectors on all compliance samples associated with the discharge permit program, as specified in the laboratory capacity plan (element L-2).

Ecology shall adopt regulations requiring all permittees to use a certified laboratory for their compliance and self-monitoring wastewater analyses and requiring all certified laboratories to use specified protocols and comply with specified quality assurance/quality control procedures (see Laboratory Support program). Before implementing this requirement of permittees, Ecology shall ensure that the laboratory certification program is operational (see element L-1) and that a sufficient number of certified labs are available to carry out needed analyses. Labs owned and operated by individual industrial and/or municipal dischargers shall be eligible for certification. Ecology shall report to the Authority (see P-28) and the Lab QA/QC Working Group (see L-4.2) on the progress in meeting the lab support goals associated with the permit program.

Target Dates: Major NPDES dischargers to begin using labs participating in the accreditation program by July 1992, dischargers with permitted flows exceeding five million gallons per day by July 1993, and all other dischargers by July 1994.

[Status: WAC 173-50-110 requiring lab accreditation (certification) was adopted on April 20, 1989. The lab accreditation program is underway. As of September 1990, 25 labs have been accredited, including Ecology's Manchester lab.]

P-17. Data Management

Ecology shall evaluate its data management needs to implement the Puget Sound plan's municipal and industrial discharges program and its current data management system and submit to the Authority a plan to upgrade the system as appropriate.

Ecology shall complete the initial implementation of its computerized Wastewater Discharge Information System for tracking self-monitoring reports of dischargers and other information related to major NPDES permits.

Ecology shall complete the initial loading of data related to state (pretreatment) and minor NPDES permits and begin incorporating routine self-monitoring data for these permits into the Wastewater Discharge Information System (WDIS). Ecology shall ensure that the WDIS system incorporates results of class I and class II inspections.

Ecology shall store monitoring data of the five types outlined in element P-8 submitted by dischargers in a manner compatible with information in the Puget Sound Ambient Monitoring Program (see element M-6). In addition, Ecology shall maintain accurate records of outfall locations (and other useful information pertaining to mapping the effluent impacts of discharges as additional funds become available) in the Wastewater Discharge Information System as appropriate, and provide this information to the Puget Sound Geographic Information System (GIS) (see M-4).

Target Dates: Submit Data Management System Plan by June 30, 1991. Continue to load as much data as is possible with the current system and resources. Complete implementation of the data management plan by June 30, 1994.

[Status: Basic data entry for selected permit program information is ongoing, but difficulties persist as the WDIS system has been undergoing major revision. WDIS currently provides conventional pollutant data and enforcement data tracking.]

Enforcement

P-18. Adopt Enforcement Policies as Regulations; Report on Enforcement; Encourage Compliance

The objective of this element is to develop a more effective enforcement program which is consistently, efficiently, and fairly applied to the regulated community for the purposes of protecting the water and sediment quality of Puget Sound.

In a joint effort with the Authority, Ecology shall build upon its current efforts and complete an enforcement program evaluation study and long-range plan which address but are not limited to the following issues:

- a. Determining rule versus policy guidance;
- b. Modifying statutes and developing rules;
- c. Ensuring effective public involvement (including a feedback mechanism to the public on the status of enforcement actions);
- d. Identifying and addressing concerns from: Ecology inspectors, the regulated community, environmental and citizen groups, federal and state agencies, and tribal governments;

- e. Identifying and removing barriers to effective enforcement;
- f. Having the Pollution Control Hearings Board develop and codify consistent appeals review criteria. The criteria should ensure procedures which provide equal risks that appealed actions may result in either more stringent or less stringent results;
- g. Improving the efficiency of the enforcement procedures and incorporating any appropriate recommendations of the Efficiency Commission;
- h. Ensuring adequate staffing, resources, and legal support;
- i. Evaluating monetary issues pertaining to program funding mechanisms, establishing appropriate penalty amounts, indexing penalties for inflation, and charging interest for delinquent penalties;
- j. Providing incentives to dischargers and enforcement mechanisms to encourage waste minimization, recycling, and creative compliance;
- k. Ensuring consistency of enforcement actions;
- l. Ensuring enforceable sample collection and security procedures;
- m. Incorporating training and quality control mechanisms;
- n. Ensuring even-handed enforcement of both public and private dischargers, and establishing stormwater enforcement procedures;
- o. Defining violation types, a penalty matrix based on severity of the violation, an exclusion of penalties for violations (1) within established analytical error factors, or (2) minor infrequent violations due to the variability of the effectiveness of treatment methods, and escalation of penalties for repeating violations ultimately to permit revocation;
- p. Providing efficient tracking and reporting mechanisms;
- q. Continuing to track enforcement trends; and
- r. Providing recommendations for priorities and an implementation schedule.

In accordance with a budget proviso in Chapter 7, Section 303, Laws of 1987, 1st ex. session, Ecology shall adopt regulations specifying minimum penalties for permit violations. Ecology is encouraged to seek legislation to modify existing statutes as necessary. Ecology shall adopt as regulations other significant policy elements of its enforcement guidelines, including the escalation policy for continuing or repeated violations and, if appropriate, creative tools for encouraging compliance. It is the intent of this element that Ecology fully consider for adoption the significant policy aspects of its enforcement guidelines rather than the procedural details. It is the intent of the Authority in directing that the significant aspects of the enforcement guidelines be considered for adoption as rules that significant changes be subject to the public review and comment process required by the Administrative Procedures Act before such changes are implemented.

As part of the enforcement study and plan, Ecology shall submit to the Authority a list of all water-quality related civil and criminal enforcement actions taken during the previous year, together with statistics on the percentage of Ecology enforcement actions that were appealed and the dollar amounts of

penalties assessed versus those sustained. Where possible, Ecology may include statistics on cases in which the Pollution Control Hearings Board has considered the post-penalty behavior of a violator in determining the amount of penalty to be sustained. Ecology is encouraged to submit its analysis of the effects of the Board's actions on the department's enforcement program together with any recommendations it may have.

Target Date: Submit the enforcement study and plan to the Authority by December 31, 1993. Complete rule adoption and any necessary legislative revisions by June 30, 1995.

[Status: This element previously required the Pollution Control Hearings Board to submit a report on the issue of de novo review of Ecology's enforcement actions; the report was submitted on schedule. PCHB could not review Ecology's enforcement guidelines due to lack of information; the guidelines are not considered in appeals due to their status as guidelines rather than formal regulations. Ecology has issued an enforcement manual that contains guidelines and procedures. Ecology updated its enforcement policy in early 1990. Ecology has begun to evaluate its enforcement program and compiled an enforcement trends report.]

P-19. Training for Inspectors and Permit Writers

In addition to the technical assistance provided under element P-5.2, Ecology shall establish an ongoing, vigorous program of training for inspectors and permit writers, including cross-training in other environmental regulatory programs, recognition of problems related to cross-media transfer of pollution, and opportunities to reduce or recycle waste at the source. Ecology shall assure that an appropriate percentage of inspectors' and permit writers' time is allocated to training activities. Ecology shall provide specialized training sessions on checklist items of the permit writers manual, setting discharge limits for toxicants, setting sediment standards, biomonitoring, pretreatment, conducting inspections, taking samples, data management, enforcement procedures, and waste minimization. Ecology shall establish minimum training requirements for permit writers and ensure that staff shall write permits only after they have completed these requirements. Ecology shall take advantage of existing training programs, such as those offered by the U.S. Environmental Protection Agency, to the maximum extent practicable.

Target Date: This program is ongoing.

[Status: Funding to begin this element became available in February 1988. Ecology hired a training coordinator in February 1989, drafted a training strategy, and sponsored several permit writer training sessions in 1989.]

P-20. Search for Unpermitted or Illegal Discharges

In coordination with the urban bay action teams, Ecology shall carry out a program for detection of illegal dischargers or wastewater discharges not covered by permits. This shall apply to both direct and indirect wastewater discharges and to direct discharges of stormwater from industrial facilities. Ecology shall ensure that its enforcement guidelines incorporate appropriate automatic penalty provisions for instances when dischargers without permits are discovered. Ecology shall submit a report to the Authority on the number and characteristics of unpermitted discharges discovered through this element and through the urban bay action teams, together with any analysis and recommendations that the department may have.

Target Date: Ecology to submit report by June 30, 1996.

[Status: Not funded to date. Ecology formed an internal committee and started work; also, there has been effort to find unpermitted discharges in areas where urban bay action teams are functioning.]

P-21. Felony Provisions

The Authority shall submit proposed legislation to the legislature to amend appropriate sections of the state water pollution control act (RCW 90.48) to provide for felony penalty provisions. The proposed legislation shall ensure that accidental or emergency bypasses are not subject to the felony penalty, but rather shall target willful violators with demonstrated knowledge and intent to commit the violation.

Target Date: Resubmit to 1993 or subsequent legislature.

[Status: Proposed legislation passed the House but failed to pass the Senate in the 1987, 1988, and 1989 legislative sessions. It was not resubmitted to the 1990 session.]

Pretreatment

P-22. Pretreatment Program Enhancements

Ecology shall assign sufficient staff to fully carry out the pretreatment program, including permitting (with appropriate conditions for monitoring and control of toxicants in accordance with elements P-5 through P-8), compliance tracking, inspections, spill control, public notice, auditing of local programs, and enforcement as needed. Ecology is encouraged to develop such effluent guidelines and technical standards as may be necessary to assist in the efficient administration of state and local pretreatment programs.

With the involvement of local governments, delegated and non-delegated pretreatment agencies, federal and other state agencies, tribal governments, and interested citizens, Ecology shall prepare a report which will evaluate the pretreatment program and addresses but is not limited to the following issues:

1. Ensuring program consistency across jurisdictions in order to eliminate the creation of pollution-tolerant zones for indirect dischargers;
2. Requiring all municipal treatment plants of five million gallons per day (dry weather) flow and greater (or less than 5 MGD if appropriate) to develop and implement their own pretreatment program, with Ecology serving in a technical assistance and oversight/enforcement role;
3. Ensuring the adequacy of staffing and funding resources;
4. Completing revisions of the domestic sewer exclusion rules, planning for future federal revisions, and ensuring that widespread education regarding proper small business and household hazardous waste disposal is a minimum requirement of all pretreatment programs;
5. Coordinating with the pretreatment sludge disposal program developed as part of element P-7;
6. Setting minimum pretreatment program requirements for municipal NPDES and pretreatment permits and establishing a permit quality review mechanism to ensure that those requirements are being included;

7. Developing mechanisms to ensure that local governments (via comprehensive plans, etc.) identify new indirect dischargers resulting from regional growth and conversion of rural land use to urban uses including coordination with the state Growth Management Act (SHB 2929), and evaluating the cost impacts and enforcement issues for municipalities;
8. Developing computerized program data management and tracking tools to effectively track compliance with minimum pretreatment program requirements;
9. Consulting with Ecology staff, the regulated community, the public, and other state and federal agencies as appropriate to identify and resolve any other barriers to success;
10. Providing recommendations and an implementation schedule for pretreatment program enhancements.

Ecology shall regularly report pretreatment program status and the progress in implementing the enhancements as part of the P-28 reports.

Ecology shall amend Chapter 173-216 WAC (and other rules as necessary) to clarify that the domestic sewage exclusion under federal law does not apply under Washington's hazardous waste rules and that a hazardous waste may not be legally discharged to a sewer unless this is specifically allowed by permit. Ecology shall take steps to ensure that hazardous waste generators are aware of this clarification.

Target Dates: Begin phasing in additional staff by January 1, 1988. Submit pretreatment report to Authority by December 31, 1991, and complete program enhancements by June 30, 1993.

[Status: Plan resources were used during fiscal year 1988 to allow Ecology to retain existing pretreatment staff when federal funding ceased. A modest increase in staff levels occurred in fiscal year 1989. The staffing level remains substantially below the target level due to budget shortfalls. The moderate staffing increases have helped to start some needed program improvements. Revisions to the state Dangerous Waste Rule regarding the domestic sewer exclusion are nearing completion. Federal revisions to 40 C.F.R. 403 pretreatment regulations occurred in 1990.]

Information/ Education/Technical Assistance

P-23. Municipal Operator Training

The Waterworks and Wastewater Certification Board shall ensure that each wastewater treatment plant operator certification examination covers basic issues and facts about industrial discharges, pretreatment laws and regulations, treatment technologies, maintenance and troubleshooting, and recognition of pretreatment-related problems. The Board shall consult with the Authority and affected groups of wastewater treatment plant operators in drafting any additional test questions related to these topics. The Board shall also assist the Department of Ecology in the preparation of handouts identifying up-to-date pretreatment rules, regulations, and technology. Such handouts shall be mailed to all certified operators at least annually. The Board shall encourage certified operators to attend pretreatment workshops, conferences, and courses for credit toward the mandatory professional growth requirement.

The Board is encouraged to review its testing and certification methodology to reflect the level of responsibility of the operator for pretreatment programs.

Target Date: Annual mailings are ongoing.

[Status: Ecology and the Board met the target dates.]

P-24. Certify Industrial Treatment Plant Operators

In conjunction with its technical outreach to dischargers under element P-27, Ecology shall explore and facilitate the development of a voluntary process for certification of both direct and indirect discharger industrial treatment plant operators, through a private trade or professional association or other appropriate entity. Certification shall initially be voluntary and evolve into a mandatory process. In exploring this approach, Ecology shall consult with industrial dischargers and treatment plant operators, private trade and/or professional organizations, appropriate labor unions, the Authority, and other interested individuals and groups in Washington and other states.

Target date: Phase in implementation of voluntary program by June 30, 1996; phase in mandatory program by June 30, 1997.

[Status: Not funded; no activity undertaken to date.]

P-25. Employee Education Assistance

(See also element EPI-5.1.) In connection with the current employee education programs required under the state Worker Right-to-Know law (Chapter 49.70 RCW), Ecology and the Department of Labor and Industries shall prepare and implement a coordinated plan for developing and distributing educational materials for employees to appropriate employers in the Puget Sound basin. This plan shall establish a schedule for distribution of such materials to these employers and shall establish a schedule for any necessary rulemaking by Ecology or Labor and Industries. Educational materials to be prepared shall provide information on the environmental consequences of waste disposal decisions typically made by employees of the firms and/or agencies included in the program.

Target Dates: Begin implementation by December 31, 1995.

[Status: Not funded; no activity to date.]

Public Involvement

P-26. Public Outreach

Ecology shall establish a public outreach position to act as a central clearinghouse for the public to contact regarding permits, and to actively contact and assist groups and individuals regarding the NPDES and state waste discharge permit program and related activities. For each permit or action under consideration, this person shall seek out those who may be interested or affected, inform them of the significance of the action, highlight key decision-making points, and provide technical assistance in working through the process. The public outreach person shall take an active role in reviewing permit fact sheets for completeness and understandability by the public and publicizing which permits are open for public comment. This position shall also assist citizens and environmental groups, as well as federal and state agencies and local and tribal governments upon their request (Washington Departments of

Natural Resources, Fisheries, Parks, Wildlife, and Health, etc.) in reviewing NPDES permits (see element P-5.4), and shall ensure that they get copies of draft permits for dischargers that may affect their jurisdiction or areas of interest.

Ecology shall also expand its permit mailing lists to achieve broad circulation, regularly provide program information in general publications (e.g., newsletters, brochures), provide informative and widespread public notice of draft permits, and establish criteria for deciding when a public hearing will be held on a permit. In establishing criteria, adopting guidelines, and developing rules, Ecology shall actively seek and provide opportunity for meaningful public involvement in accord with the public involvement policy (EPI-3) of this plan.

Target Date: Establish centralized permit outreach mechanisms by March 31, 1991.

[Status: Ecology filled the position in July 1990 and work has begun on a public outreach plan.]

P-27. Technical Outreach to Dischargers

(This element constitutes a part of element EPI-5.1. The target audience is municipal and industrial dischargers.)

Ecology shall develop (or contract with an appropriate organization to develop), and submit to the Authority for approval, a program plan to provide technical outreach to dischargers on the new permit improvements required by the permit writers' procedures manual, with which they are expected to comply, including the requirements of other Ecology programs. Ecology shall establish a regular discharger newsletter to inform all dischargers of the upcoming changes in permitting requirements and the reasons for them, along with other useful information. To the maximum extent possible, Ecology shall consolidate water pollution control information with other environmental requirements to provide useful, timely, coordinated, and accessible information and one-stop answers regarding multiple environmental programs. For maximum efficiency, the program shall emphasize delivery of information through existing mechanisms such as trade and professional organizations rather than to individual dischargers. In developing the program, Ecology shall consult with staff who operate similar functions in other states. Ecology shall coordinate this program with the business assistance (pollution prevention pays) program authorized by RCW 70.105B.200.

In coordination with Ecology's Office of Waste Reduction and Recycling, and the Point Source Section, the Authority shall initiate the development of a Technology Institute at the University of Washington or other appropriate state universities (pursuant to RCW 28B.20.420 and .422). The institute shall identify, develop, and promote the latest pollution control technologies (emphasizing field-tested, cost-effective waste recycling/reduction/minimization strategies as well as treatment technologies or combinations thereof) for the applied purpose of determining all known and available technology for use in the regulatory process for direct and indirect dischargers. The Authority shall coordinate efforts to disseminate the results of the technology institute's work. In conjunction with Ecology, the Authority shall investigate appropriate mechanisms for long-term funding of the institute including the state general fund, taxes, or permit fees. The Authority shall also research funding mechanisms to assist businesses with implementation of pollution control strategies.

Experience gained in providing consolidated information to dischargers shall be transmitted to agency program development staff to ensure that environmental programs are consistent with each other.

Target Date: Submit technical outreach plan to Authority by December 31, 1992. Authority to initiate the Technology Institute by September 30, 1993.

[Status: This element has not been funded to date.]

P-28. Ecology Reporting Requirements

In addition to the biennial reporting requirement under RCW 90.70.070, Ecology shall publish a report annually on the NPDES and state permits in the Puget Sound basin that it has considered for issuance, renewal, or modification.

Ecology shall briefly summarize in the report for the previous 12 months the following items and compare them to goals and historical trends when such data are available:

- a. Permit Quantity: The number of permits issued (major, minor, state, 401 certifications); the number of backlog expired permits; comparison to State/EPA agreement; the amount of permit fees collected.
- b. Permit Quality: The number and percent of issued permits which fully met the minimum checklist requirements (see P-5.1, P-22).
- c. Inspections Performance: The number and type of inspections (P-14); the average and maximum turnaround times for inspection reports to dischargers and permit writers, and for compliance sample lab data (P-16).
- d. Compliance/Enforcement Trends: Rates for significant noncompliance, both direct and indirect dischargers, and enforcement actions and trends.
- e. High Priority Elements: Major accomplishments toward implementing elements P-1 through P-4.1 (rules), P-4.3 (efficiency improvements), P-5.2 (quality assurance), P-9 (spill plans), P-13 (UBATs), P-16 (lab support), P-17 (data management), P-19 (training), P-22 (pretreatment), P-26 (public outreach, and P-27 (discharger outreach).

Ecology is encouraged to include other information that may be useful, to present the information in tabular, comparative, or other form that facilitates review and analyses, to comment on its experience in implementing these elements, and to provide appropriate recommendations.

Target Date: Submit report by June 30, 1991, and annually thereafter.

[Status: This element was proposed to begin in July 1989. Ecology has not begun preparing the report due to lack of funding. The Authority and Ecology have compiled some preliminary data which demonstrate substantial improvements in both the quantity and quality of permits issued.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Revision to water quality standards rule (P-1).
2. Adoption of sediment standards rule (P-2).

3. Adoption of mixing zone rules (P-3).
4. Revision to rules for expanded permit fees (P-4).
5. Adoption of permit writers' procedures manual and permit quality control plan. (P-5).
6. Adoption of monitoring guidelines (P-8).
7. Adoption of enforcement policy rules (P-18).
8. Employee education program (P-25).
9. Report on waste discharge permits (P-28).

LEGISLATION REQUIRED

Future Sessions

1. Ecology to consider removing the municipal permit fee cap (P-4.1).
2. DNR encouraged to modify aquatic lands leasing rates.
3. Ecology to consider revisions to solid waste/hazardous waste statutes (P-7).
4. Ecology encouraged to modify enforcement statute.
5. Authority to resubmit felony provisions (P-21) in 1993 or subsequent sessions.

[Status: Legislation authorizing expanded permit fees was enacted in October 1987 and subsequently amended by Initiative 97; felony provisions were considered but not enacted by the 1987, 1988, and 1989 legislatures.]

ESTIMATED COST

Funding requested for this program totals \$9.3 million for the 1991-93 biennium of which \$6.4 million is permit fee-eligible. The elements with the largest costs during the 1991-93 biennium include the effort to strengthen effluent limits and monitoring requirements in permits (P-6 through 10), increased staffing for the urban bay action program (P-13), inspections (P-14), pretreatment (P-22), and completion of the permit writers' manual (P-5). In future biennia, costs increase substantially as the full schedule of inspections (P-14) is phased in.

In accordance with legislation enacted in October 1987, Ecology began charging increased permit fees on July 1, 1988. Initiative 97, adopted in November 1988, amended the permit fee statute, calling for permit fees to fully recover expenses related to the permit program and removing the statewide cap of \$3.6 million per year imposed by the October 1987 statute. It is assumed that about \$3.8 million per year will be available from permit fees to support the fee-eligible activities in the Puget Sound basin during the 1991-3 biennium. Activities in the Municipal and Industrial Discharges Program that are not fee-eligible as defined in RCW 90.48.465, as well as any fee-eligible activities that exceed the fee revenues collected, would be funded from other sources such as the general fund.

The cost estimates do not include costs that may be incurred by dischargers in complying with the more stringent monitoring requirements, permit limits, and other elements of the plan. Most dischargers would incur increased costs for the additional monitoring that would be required under element P-8. While the specific costs would depend on the content of the guidelines that Ecology is directed to prepare and on the particular characteristics of each effluent stream and the local receiving environment, the tiered approach would be expected to minimize additional monitoring costs for dischargers where no problems are discovered during first-tier monitoring. A rough estimate of the maximum cost of first-tier monitoring for the largest, most complex discharges is \$20,000 to \$50,000 per year. An industry association estimated monitoring costs at 10 times these levels. Their estimates, however, included many requirements already mandated by federal and state law, and not the incremental costs associated with implementation of the Puget Sound plan. They also selected worst case sites for their example, which would not be typical. Monitoring costs would be much less for smaller, less complicated discharges. In cases where problems are discovered in first-tier monitoring, costs for further monitoring to confirm and characterize the source of the problem (and for additional pollution control of any problem pollutants discovered) could be substantial, but cannot be estimated with current information.

Some dischargers would have new or more stringent limits imposed on the discharge of specific toxicants (in the dissolved or particulate phase) or on the overall toxicity of the effluent. The cost of meeting more stringent limits would depend not only on the specific limits that are chosen by Ecology but also on the particular circumstances of the plant involved.

Costs to meet effluent limits could vary widely, from virtually no cost to many millions of dollars for new treatment systems or process changes. For example, a toxicant in the effluent of a pulp mill was traced to contamination in one of the chemicals purchased by the mill. This toxicant was controlled at virtually no cost to the mill by having a chemical supplier provide uncontaminated chemicals. This and other waste minimization and recycling efforts can be very cost-effective. The 1991 plan provides more emphasis to these concepts than did earlier plans.

Dischargers have commented strongly that the plan should tally up the total cost spent to date on treatment and monitoring by dischargers. We have not done this because these costs are associated with meeting previously existing federal and state law, and do not reflect the incremental costs associated with the plan implementation.

Some toxicants are either unavoidable byproducts of or required in the discharger's process. Requiring known, available, and reasonable treatment to control these toxicants may necessitate substantial modification of the process or the installation of a new, end-of-pipe treatment system. Costs for toxicant control cannot be estimated until Ecology determines specific case-by-case limits and each discharger determines what modifications, if any, are necessary to meet the limits.

Other elements of the program may also affect costs to dischargers. Permit fees under this program have increased substantially in accordance with the statutory changes enacted in 1987, 1988, and 1989 and are expected to increase further in 1991. A number of financial incentives are included which would significantly increase costs for polluters and decrease costs for those in compliance. Laboratory costs will increase due to the requirement to use certified labs. Industrial treatment plant operators would incur some cost in complying

with certification requirements to be established and in paying certification costs. Some dischargers would incur costs as a result of enforcement action taken when violations are detected through increased inspections and compliance review efforts by Ecology. Finally, dischargers would incur some increased costs to comply with spill and stormwater control requirements for plant sites. Dischargers are particularly concerned about the costs for managing contaminated stormwater. These costs would be extremely variable and would depend on the characteristics of the site and the types of materials used or stored on the site. Compliance costs for permitting stormwater could be minimal (as for best management practices) for municipal stormwater outfalls or fairly costly for monitoring and best available technology implementation for the most complex industrial stormwater outfalls.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Municipal and Industrial Discharges

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
P-0 Program Management ²	\$26,000	\$57,042	\$409,016	\$409,373	\$409,016
P-2 Sediment Standards	\$199,863	\$263,508	\$418,934	\$28,616	\$28,616
P-3 Mixing Zone Criteria ³	\$27,496	\$68,842	\$32,292	\$0	\$0
P-4 Discharger Fees	\$160,936	\$275,186	\$86,668	\$36,944	\$56,976
P-5 Permit Manual and Technical Assistance ⁴	\$244,599	\$275,186	\$999,026	\$533,826	\$533,826
P-6, 7, 8, 9 ⁵ , 10 Wastewater Permits ⁶	\$575,031	\$1,307,402	\$2,649,008	\$3,166,222	\$3,604,661
P-11 Enhanced EPA-issued Permits ⁷	\$31,551	\$187,804	\$134,024	\$134,024	\$134,024
P-13 Urban Bay Action Teams ⁸	\$0	\$0	\$1,434,721	\$1,691,374	\$1,691,374
P-14 Inspections	\$252,482	\$1,281,738	\$2,551,460	\$4,540,176	\$4,471,680
P-15 Independent Verification of Self-Monitoring	\$0	\$0	\$0	\$64,388	\$0
P-16 Certified Labs for Self-Monitoring ⁹	\$0	\$0	\$152,271	\$143,084	\$143,084
P-17 Data Management	\$154,969	\$344,132	\$1,009,084	\$652,336	\$632,336
P-18 Adopt Enforcement Policies	\$17,000	\$0	\$304,542	\$752,168	\$1,324,504
P-19 Training Permit Writers and Inspectors ¹⁰	\$33,441	\$68,840	\$445,904	\$379,094	\$379,094
P-20 Search for Unpermitted Discharges	\$0	\$0	\$0	\$0	\$659,084
P-21 Felony Provisions	\$0	\$8,556	\$12,644	\$25,288	\$25,288
P-22 Pretreatment Program Enhancements	\$196,542	\$312,714	\$581,722	\$715,759	\$2,415,452
P-23 Municipal Operator Training	\$79,991	\$180,000	\$168,808	\$168,808	\$168,808
P-24 Certify Industrial Plant Operators	\$2,852	\$0	\$0	\$0	\$354,542
P-25 Employee Education Assistance	\$0	\$0	\$0	\$0	\$338,271
P-26 Public Outreach	\$54,156	\$137,890	\$263,670	\$263,670	\$263,670
P-27 Technical Outreach to Dischargers ¹¹	\$0	\$0	\$413,180	\$400,318	\$400,318
P-28 Ecology Reporting Requirements	\$0	\$0	\$106,589	\$100,158	\$100,158
TOTALS	\$2,056,909	\$4,768,840	\$12,173,563	\$14,205,626	\$18,134,782

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² PSWQA and Department of Ecology administration and coordination.

³ Assumes that permit writer training time is funded by elements P-6, 7, 8, and 9; and training, tuition, etc., is funded in element P-19.

⁴ Includes professional editing of permit writer manual.

⁵ New tasks are funded under Spill Prevention and Response element SP-6.

⁶ Elements P-6 through P-10 involve writing discharge permits, establishing effluent limits, and monitoring requirements.

⁷ Includes state certification of EPA-issued permits under section 401 of the federal Clean Water Act.

⁸ UBAT personnel also funded under Sediments element S-8.

⁹ Portions of this are funded in Laboratory element L-2.

¹⁰ Cost estimate is for trainers. Permit writer and inspector training is included in elements P-6,7,8,9,10,14, and 22.

¹¹ Includes funds for a discharger newsletter and the UW Technical Institute, funded through the state general fund.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Municipal & Industrial Discharges

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Natural Resources	\$0	\$0	\$48,595	\$26,596	\$26,596
Department of Health	\$0	\$0	\$22,910	\$21,910	\$21,910
Department of Ecology	\$1,945,066	\$4,390,390	\$11,413,580	\$13,471,460	\$17,374,616
EPA Region 10	\$0	\$132,852	\$211,410	\$211,410	\$211,410
Department of Labor and Industry	\$0	\$0	\$0	\$0	\$26,000
Local Governments	\$65,991	\$180,000	\$163,800	\$163,800	\$163,800
Pollution Control Hearings Board	\$17,000	\$0	\$0	\$0	\$0
Puget Sound Water Quality Authority	\$28,852	\$65,598	\$251,150	\$263,794	\$263,794
Tribal Governments	\$0	\$0	\$26,000	\$26,000	\$26,000
Department of Fisheries	\$0	\$0	\$16,575	\$9,894	\$9,894
Department of Wildlife	\$0	\$0	\$19,543	\$10,762	\$10,762
TOTALS	\$2,056,909	\$4,768,840	\$12,173,563	\$14,205,626	\$18,134,782

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$26,000	\$26,000	\$26,000
Federal Funding Sources	\$0	\$446,712	\$211,410	\$211,410	\$211,410
Local Funding Sources	\$65,991	\$180,000	\$163,800	\$163,800	\$163,800
Permit Fee	\$1,618,000	\$2,162,288	\$9,038,353	\$10,935,450	\$13,004,761
State General Fund	\$372,918	\$1,979,840	\$2,678,000	\$2,868,966	\$4,728,811
Toxics Accounts	\$0	\$0	\$56,000	\$0	\$0
TOTALS	\$2,056,909	\$4,768,840	\$12,173,563	\$14,205,626	\$18,134,782

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

CONTAMINATED SEDIMENTS AND DREDGING PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION

Environmental Problems



The accumulation of toxicants in sediments and resulting damage to natural populations is recognized nationally and internationally as one of the most serious threats industrialized society poses to the marine ecosystem. Toxic contaminants bind to particles and are retained as sediments in the Puget Sound basin. Toxic compounds are found in a wide range of concentrations in recently deposited surface sediments at many locations in the Puget Sound area. Although contaminant levels in some surface sediments have started to decrease since the introduction of pollution controls over the last few decades, contamination levels in the deep central Puget Sound basin are still significantly higher than estimated preindustrial levels. In urban areas the present levels of contamination are much higher, up to 100 times the levels in the cleanest rural bays.

The Department of Ecology compared chemical concentrations in sediments at 1,054 Puget Sound stations with the chemical criteria in the Interim Sediment Quality Evaluation Process for Puget Sound Sediments, issued December 4, 1989. Sediments that exceed the criteria are presumed to be causing harm in the environment. The stations are concentrated in the urban bays and are not representative of the overall distribution of contamination in Puget Sound sediments. More than 400 of the stations exceeded the sediment quality criteria. Forty-eight different chemicals exceeded the chemical criteria at one or more stations.

Sediment samples collected in recent years from many locations in Puget Sound—including Bellingham Bay, Commencement Bay, Port Gardner Bay, Elliott Bay, and Eagle Harbor—were very toxic to bioassay organisms. Lower levels of toxicity have been observed in samples from many other locations. These samples were generally collected from the top two centimeters of sediment—the material that had accumulated within the last one to five years—indicating recent or ongoing sources of contamination.

The benthic (bottom-dwelling) populations at many locations are also considered damaged (significantly altered in composition or seriously reduced in total abundance) by sediment pollution.

Toxicants reach the water from many sources, but the principal ones are unpermitted discharges, stormwater runoff, raw sewage discharges (e.g., combined

sewer overflows), and permitted point source discharges (industrial and municipal outfalls). Air pollution appears to be a large contributor of toxicants to Puget Sound. Some of the airborne contaminants enter the water directly. Others are washed off the land by runoff. In addition, dredging and disposal can disturb and redistribute these materials.

Institutional Problems

Sediment contamination is generally regulated by programs aimed at protecting water quality. Since toxicants can concentrate in sediments, harmful sediment contamination can occur even when the water column is not seriously contaminated. Prior to adoption of the 1987 Puget Sound Water Quality Management Plan, the existing programs lacked clearly stated goals or policies for the prevention of sediment contamination.

The regulation of discharges, the management of dredging and disposal, and the identification and ranking of contaminated sediment sites for cleanup have all been hampered by the absence of any adopted sediment standards. In addition, regulation of sources of toxicants has generally not addressed the contaminated sediment particles suspended in effluents.

Dredging is necessary to create and maintain docks and navigation channels. Dredging and disposal are highly regulated through state and federal permit systems. Dredged material with low levels of contamination may be disposed of at open water sites. Dredged material with higher levels of contamination is required by these programs to be disposed of at confined disposal sites. The Puget Sound Dredged Disposal Analysis (PSDDA), a cooperative effort by the U.S. Army Corps of Engineers, the Environmental Protection Agency, and the state Departments of Natural Resources and Ecology, has developed evaluation procedures and established new sites for unconfined open water disposal. However, the disposal of sediments that are too contaminated to be disposed of in unconfined open water sites is still being evaluated on a case-by-case basis without uniform standards. In addition, no decision has been made about establishing multiuser disposal sites for the more contaminated sediments.

Areas that have been identified as having serious sediment contamination are being addressed in several locations through the EPA-Ecology urban bay action program and Superfund investigations. The National Oceanic and Atmospheric Administration (NOAA) has notified a number of dischargers and property owners around Puget Sound that they may be subject to claims for natural resource damages associated with sediment contamination. Until lately, an inventory of locations with contaminated sediments would have been impossible. Although an inventory is now possible, funding for investigations and sediment cleanup actions is an ongoing problem.

PROGRAM STATUS

Implementation of the contaminated sediments program was initially delayed by severe funding limitations, delays in hiring Ecology staff, and delays in the PSDDA program. The program received only 40 per cent of the Ecology funding needed in the 1987-89 biennium and about 75 per cent of the Ecology funding needed in the 1989-1991 biennium to implement the program. Highest priority was placed on those elements (such as S-4) which produce crucial management rules. As a result, very little funding was provided for the investigations of contaminated sediment areas (S-8). Ecology has strengthened the urban bay program (S-8) using other funding sources. Significant progress has now been made on all other elements.

The first phase of PSDDA, covering central Puget Sound, was completed during the summer of 1988, and three phase I disposal sites are in operation. Phase II, covering northern and southern Puget Sound, was completed during the fall of 1989. Shoreline permits have been granted for the five planned phase II sites. Baseline studies of the sites have been completed.

Ecology has made significant progress on adopting sediment quality standards (a vital part of the sediment program required under element P-2). A number of technical studies have been completed and an issue paper was released, dealing with issues raised by Ecology's Sediments Advisory Group. Ecology issued the Interim Sediment Quality Evaluation Process in December 1989. The proposed sediment management rule, combining sediment quality standards and source control and cleanup standards, is being taken through the formal rulemaking process.

Consultant studies supporting standards for the confined disposal of dredged material (S-4) have been completed and reviewed by a Technical Advisory Committee. A Confined Disposal Work Group discussed additional policy issues and a rule is being drafted that also includes open water unconfined disposal standards developed under PSDDA.

Ecology has researched issues affecting the question of establishing multiuser confined disposal sites (S-6) and is preparing its report to the Authority. An Agency Forum on Sediment Issues (AFSI) has been meeting to work with Ecology on the multiuser confined disposal sites program.

Funding restrictions have severely limited the investigations of contaminated sediment sites (S-8). Urban bay action teams were established at several additional bays, but funding for field studies has been inadequate. EPA's role has decreased, with Ecology generally taking the lead on new projects. Ecology has increased urban bay action team activities using other funding sources and is now involved in seven projects.

A number of major projects related to contaminated sediments have moved forward. The Navy Everett Homeport project originally proposed capped in-water disposal of sediments unsuitable for open water disposal. The project received a water quality certification from Ecology and a shoreline permit from the city of Everett. The shoreline permit and the water quality certification were immediately appealed to the Shorelines Hearings Board and the Pollution Control Hearings Board. Those boards upheld the permits. The federal court subsequently ruled, in a case brought by several environmental groups, that the environmental impact statement for the project was not adequate. The Navy and the environmental groups entered into an agreement under which the Navy redesigned the project to leave the most contaminated sediments in place. Less contaminated sediments (suitable for open water disposal) were dredged and disposed of at the PSDDA site in Port Gardner. The project is proceeding. Ecology established an urban bay action team for Everett to address the remaining sediment contamination.

In a major project involving a cleanup action, Simpson Tacoma has capped highly contaminated sediments at its plant on Commencement Bay. The Commencement Bay Nearshore/Tideflats Superfund project has proposed a \$28 million cleanup of other contaminated sediments in that area.

The Washington Department of Transportation, at the suggestion of Metro and the City of Seattle, placed clean sediments over an existing sedimentation hot spot along the Seattle waterfront as part of a major reconstruction of the Seattle

Ferry Terminal. Metro placed clean dredged material on the hot spot caused by the Denny Way combined sewer overflow in Elliott Bay.

PROGRAM GOAL

To reduce and ultimately eliminate adverse effects on biological resources and humans from sediment contamination throughout the Sound by reducing or eliminating discharges of toxic contaminants and by capping, treating, or removing contaminated sediments.

STRATEGY

The strategy for achieving this goal is to (1) classify sediments that cause adverse biological effects and significant human health risks; (2) implement Soundwide controls on sources of contaminants causing sediments to fail the sediment standards; (3) provide rules and sites for disposal of dredged materials; and (4) expand the urban bay program to provide for additional source control and consideration of cleanup actions for existing areas of high sediment contamination levels.¹

PROGRAM ELEMENTS

Policies

S-1. Sediment Program Policies

The following policies shall be followed by all state and local agencies in actions affecting sediment quality, including rulemaking, setting priorities for funding and actions, and developing permit programs:

- a. All government actions will lead toward eliminating the presence of sediments in the Puget Sound basin that cause adverse effects to biological resources or pose a significant health risk to humans.
- b. Programs for management of dredging and disposal of sediments should result in a net reduction in the exposure of organisms to adverse effects.²
- c. Sediment cleanup programs (which may include capping in place) shall be undertaken when reasonable to reduce, with the intent of eliminating, the exposure of aquatic organisms to sediments having adverse effects.³

¹ The first two elements of this strategy, classification of contaminated sediments and source controls, are included in the Municipal and Industrial Discharges Program and the Stormwater and Combined Sewer Overflows Program.

² The intent of this policy is that dredging and disposal contribute to the cleanup of the Sound by allowing unconfined open water sites to have only low levels of contamination and to dispose of more contaminated sediments in a manner that prevents continued exposure of organisms to adverse effects. For proposals where dredging will expose contaminated sediments, project-specific mitigation measures may be required.

³ Element S-7 directs Ecology to develop a decision process which will resolve the question of when cleanup actions are reasonable.

[Status: Agencies are increasingly incorporating these policies into their programs and activities. The PSDDA program and the confined disposal methods being developed by Ecology accomplish policy B. A number of sediment cleanup actions are being undertaken, as called for by policy C.]

Unconfined Open Water Disposal

S-2. Program for Unconfined Open Water Disposal

[Element Completed]

[Status: This element called for the Authority to review and comment on the Puget Sound Dredged Disposal Analysis (PSDDA) Program and to adopt final recommendations of the PSDDA Management Plans into the plan. The PSDDA program developed evaluation procedures, disposal sites, and management plans for unconfined open water disposal of dredged material, in two phases. The Authority reviewed and commented on the reports as they were produced, and adopted the recommendations in appropriate sections of the PSDDA management plans as element S-3.]

The element further provided that after the Authority adopts those sections of the PSDDA Management Plans as part of the Puget Sound Water Quality Management Plan, they shall be used by state agencies and local governments in reviewing and acting on proposals for unconfined open water disposal. This requirement has been shifted to element S-3. Element S-2 stated that the Authority might require state and local agencies to modify existing regulations and programs (including shoreline master programs) to conform to the adopted management plan. In adopting the PSDDA management plan the Authority did not require local governments to amend shoreline master programs to conform to the PSDDA recommended language.]

S-3. Unconfined Open Water Disposal Sites

The Authority adopts by reference the following portions of the Management Plans for Unconfined Open Water Disposal Phase I and Phase II :

- Selection of dredged material disposal sites at or near Everett, Seattle, Bellingham, Port Angeles, Port Townsend, Rosario Strait, Anderson/Ketron Islands, and Tacoma to serve as regional sites for disposal of dredged material that meets the PSDDA evaluation procedures (page 4-5 of the PSDDA Phase I Management Report and Chapter 5 of the PSDDA Phase II Management Report).
- Selection of disposal guidelines based on site condition I for the dispersive sites at Rosario Strait, Port Angeles, and Port Townsend and less restrictive disposal guidelines based on site condition II for the remaining non-dispersive sites (page 4-5 and Chapter 5 of the PSDDA Phase I Management Report and Chapter 4 and Exhibit A of the PSDDA Phase II Management Report).

It is the Authority's long-term goal that dredged material disposal sites have no chemical adverse effects. The Authority concurs with the PSDDA selection of Site Condition II (minor adverse effects) at the non-dispersive sites for the near term because: the sites were selected to minimize the resources affected; the

sites will receive large of amounts of material that would be cleaner than the dispersive site guidelines of site condition I, which will moderate the potential effects of the material that falls between conditions I and II; and the program of monitoring and reevaluation will allow protective adjustments to the evaluation procedures if problems develop.

- Evaluation procedures (Chapter 5 and Appendix A of the PSDDA Phase I Management Report and Chapter 5 and Exhibit A of the PSDDA Phase II Management Report).
- Disposal Site Management Plans (Chapter 6 of both the PSDDA Phase I and Phase II Management Reports). The Authority supports model shoreline master program language proposed by PSDDA for adoption by local governments and suggests that local governments consider amending their programs but is not requiring local governments to do so.
- Disposal site environmental monitoring (Chapter 7 of both the PSDDA Phase I and Phase II Management Reports).
- Data management (Chapter 8 of both the PSDDA Phase I and Phase II Management Reports).
- Annual review and program update (page 9-6 of both the PSDDA Phase I and Phase II Management Reports).

Each federal and state agency, local and tribal government, and port is required to manage dredged material disposal in open water according to the PSDDA program and the goals of the Puget Sound plan.

Changes to any of these PSDDA recommendations are considered major public actions subject to Authority review.

Target Dates: As described in PSDDA Management Reports.

[Status: Permits for the three phase I sites and the five phase II sites have been issued. The annual reviews of PSDDA were started in early 1989 and are held each spring.]

Confined Disposal

S-4. Confined Disposal Standards for Sediments

Ecology shall develop and adopt by regulation standards for reuse or disposal of dredged material that exceeds the sediment standards developed under element P-2 and that will not be disposed of at unconfined open water disposal sites established by the PSDDA process. These standards for confined disposal will be used by Ecology, shoreline jurisdictions, and local health departments in approving or denying permits for the use or disposal of dredged material that exceeds the P-2 standards. The objective of these disposal standards is to prevent the exposure of aquatic or terrestrial organisms, including humans, to adverse effects from the contaminants in the sediments.

In developing the standards Ecology shall consult with agencies and other parties with technical expertise and shall provide a public education/public involvement program. The standards shall address treatment as well as in-water and upland confined disposal methods.

Target Dates: Adopt interim standards by September 1, 1989. Adopt final standards by July 1, 1991.

[Status: Ecology did not adopt interim standards. Ecology is drafting rule language for the final standards.]

S-5. Revision of Rules and Programs

After the adoption by Ecology of disposal standards for sediments that exceed sediment standards (S-4), the Authority shall review the standards and consider the degree to which local governments and other state agencies should conform their programs to the Ecology standards so that the use or disposal of sediments in compliance with the disposal regulations is not unreasonably precluded. Shoreline master programs, solid waste rules, and the hydraulics permit rules may be affected. The Authority may then amend the Puget Sound Water Quality Management Plan to direct state agencies and local governments to revise their programs. If required, these revisions shall occur no later than two years after final action by the Authority. Any agency or local government that cannot meet this deadline shall request, at the earliest possible time, an extension from the Authority.

Target Dates: Begin review on January 1, 1991. Propose new plan language, if necessary, by July 1, 1991. Complete state/local revisions by October 1, 1993.

[Status: The actions in this element will follow those in S-4. The schedule for the Authority to adopt plan revisions has been adjusted to follow after final adoption of the 1991 plan and to allow time for the new state register notice requirements for plan amendments. The schedule for state agencies and local governments to revise their programs has also been extended.]

S-6. Multiuser Confined Disposal Sites Study

Ecology shall undertake a study of the utility and viability of establishing a system of multiuser confined disposal sites. This study shall consider the amounts, locations, and contaminant characteristics of sediments projected to be dredged; the fraction of this material that might be disposed of at multiuser sites; the legal feasibility, including liability issues; the financial feasibility of establishing such sites including fee options; the institutional options for such sites; and the technical feasibility of such sites, including in-water and upland methods. The results of the study, including specific recommendations as to whether, and by whom, multiuser sites should be established, shall be provided to the Authority.

In carrying out this element, Ecology shall consult with agencies and other parties with technical expertise and shall provide a public education/public involvement program.

Ecology may choose to make an early recommendation on whether a multiuser confined disposal site program should be established and then prepare recommendations on siting guidelines, liability management, and possible candidate sites.

The Authority will review the recommendations and decide whether a supplemental budget request should be submitted to the legislature for the 1992 regular session to support actual site development. The Authority may then amend the Puget Sound Water Quality Management Plan to direct appropriate state agencies to implement adopted recommendations.

Target Dates: Begin study by July 1988. Complete study by January 1, 1991.
Propose new plan language, if necessary, by July 1, 1991.

[Status: Elements on schedule.]

Contaminated Sediment Investigations and Cleanup

S-7. Guidelines for Sediment Cleanup Decisions

To establish a uniform decision process concerning what to do about sediment contamination, Ecology shall develop guidelines for deciding whether existing sediments that exceed the sediment standards developed under element P-2 should be capped, excavated, or otherwise treated, or whether no action should be taken. In developing the guidelines, Ecology shall consult with agencies and parties with expertise in these issues and provide a public education/public involvement program. Development of the guidelines shall include consideration of deadlines for making decisions on cleanup actions. As a guide in deciding whether to wait for natural processes to cap or dilute the sediments or to undertake cleanup actions, the guidelines shall also include consideration of a time by which surface sediments should no longer have adverse effects. Because of the high cost of treatment or removal of contaminated sediments, the guidelines shall include a process and criteria for establishing priorities for such actions, including consideration of the cost of cleanup. Development of the guidelines should include a process for ranking sediments with high levels of contamination by relative potential risk posed to human health and the environment.

Target Dates: Complete guidelines by January 1, 1991.

[Status: Ecology has completed extensive work on the decision process and has included appropriate portions, including maximum allowed cleanup levels and a decision process for establishing site-specific cleanup requirements, as part of the rule adopting sediment standards. A ranking process relative to human health risk is not currently available and has not been included in the proposed rule. Ecology considered the need for trigger levels during development of the rule and decided they were not necessary.]

S-8. Investigations and Cleanup of Contaminated Sediments

This element constitutes an expansion of the ongoing EPA and Ecology program of investigations and source control efforts in urban bays and other areas of the Sound where sediment contamination is known or suspected. This element deals with sediment contamination in three tiers. In subelement 8.1, specific sample locations that exceed sediment standards are inventoried. In 8.2, Ecology uses the inventory and other information to identify bays or other similarly sized areas for further investigation under elements 8.3 and 8.4. In 8.6, Ecology identifies specific sites that should be considered for cleanup actions under subelements 8.6 and 8.7, using ranking criteria developed in 8.5.

Element P-13 in the Municipal and Industrial Program provides additional detail on the Urban Bay Action Program.

Although this element contains specific directives and assignments, the Authority intends that EPA, Ecology, and other agencies and local governments exercise flexibility in resolving contaminated sediment problems. EPA is re-

requested to continue or increase existing support for this effort through various programs including the national funding for estuary programs, federal Superfund activities, and federal funding for Ecology water quality and hazardous waste programs. To organize and coordinate the program, Ecology, in cooperation with EPA, shall undertake an integrated program consisting of the guidelines called for in S-7 and the following components:

8.1. Inventory of Locations With Contaminated Sediments

To provide information to the Authority and the public and to allow for tracking of increases or decreases in the extent of sediment contamination, Ecology shall maintain an inventory of points or locations in the basin where sediment samples have been taken which violate the sediment standards developed under element P-2. The inventory should consist of graphic displays with locations of contamination indicated. All available sources of data, including monitoring, permit applications, and published research studies, should be used in developing the inventory. The inventory shall be integrated into the Puget Sound Geographic Information System (GIS) and used to update the Puget Sound Atlas if possible. This inventory shall be updated every two years and made available using the data transfer formats developed under element M-4. The Authority shall assist in distributing the inventory and include a summary of the inventory in the State of the Sound Report. As an aid in targeting source control activities, Ecology's inventory shall identify the chemicals or other characteristics for each location that causes it to be on the inventory.

Target Date: Establish computerized inventory and make data available to the Puget Sound GIS by January 1, 1991.

[Status: Ecology has compiled much of the existing sediment contamination information into a computerized database and can identify those stations in the database which exceed the proposed sediment standards.]

8.2. Contaminated Sediment Area⁴ Priority List and Investigation Schedule

Ecology shall develop decision criteria for identifying areas of Puget Sound where locations with sediment contamination have been identified or are suspected and where investigations both to control sources and to consider cleanup actions should be undertaken. These criteria will be used to establish a priority list of areas to be investigated, to allocate resources for contaminated sediment investigations, and to establish a schedule for these investigations. (Under element P-13, Ecology is to prepare a long-term implementation plan for the Urban Bay Action Program.) Every effort should be made to investigate each area on this priority list within five years of its first appearance on the list. Ecology shall reevaluate both the area priority list and the investigation schedule every two years. Ecology shall provide the Puget Sound Estuary Program Management Committee an opportunity to review and comment on the priority list of areas.

Although this element focuses urban bay action programs on areas with sediment contamination, Ecology may include other factors in selecting areas for inclusion in the plan for urban bay action programs.

⁴ An "area" is a bay or similar-sized region where sediment contamination might be studied and an effort made to control sources of contamination. A "site" is smaller than an "area" and defines a specific "hot spot" that might be caused by a single source and considered for cleanup action.

Target Date: The priority list of areas to be investigated is to be completed within 12 months of final adoption of sediment standards under element P-2.

[Status: Ecology presently has urban bay action programs underway in seven areas. These areas were selected over the years based on information on sediment contamination and other water quality problems. Decision criteria for identifying areas and sites based on sediment station information are being developed as part of the element S-7 and element P-2 efforts.]

8.3. Investigations of Contaminated Sediment Areas

Ecology, in cooperation with federal and state agencies and local and tribal governments, shall carry out investigations of contaminated sediment areas identified and listed under element 8.2. Investigations shall be designed on a case-by-case basis using Elliott Bay and Commencement Bay studies as the models. The investigations shall include reviews of existing information on contamination and sources as well as field investigations designed to refine information on levels and distribution of contamination and probable sources.

8.4. Action Teams and Source Control

For each contaminated sediment area being investigated, Ecology, EPA, local governments, and other appropriate agencies will form a team of investigators to work on source controls. The teams should include Ecology regional office inspectors and permit writers who normally handle the area. DNR shall participate in each urban bay action team as part of its efforts to reduce contamination of state-owned aquatic lands. Each team's activities shall be integrated with the Municipal and Industrial Discharges Program by focusing activities under that program in areas associated with contaminated sediment areas.

Urban bay action teams shall carry out various source control and investigation actions including:

- Review existing discharge permits and compliance with them;
- Reopen and modify discharge permits of sources in the vicinity to control toxicants identified at problem levels in the sediments;
- Search for unpermitted discharges and take enforcement actions;
- Investigate contamination in storm drains or groundwater and search for sources of such contamination;
- Take other actions to control sources of sediment contamination by seeking to achieve full compliance with applicable laws and regulations in locations that drain into the contaminated area; and
- Identify sites within the area that should be considered for cleanup.
- Develop urban bay action plans for each urban bay. (The development and adoption of action plans is described in element P-13.)

Ecology and EPA are encouraged to make use of industry scientists, engineers, and other experts to assist in these efforts.

[Status: Interim or final urban bay action plans have been developed for a number of bays. Implementation has been a problem because of the difficulty in funding state agency activities and because existing plans had no formal adoption process and are not considered firm commitments by participants.]

8.5. Ranking Method Study

Ecology shall review the existing method of ranking contaminated sites in urban bays as well as the ranking systems used under the federal Superfund law (CERCLA and SARA) and the state Model Toxics Control Act (Initiative 97, Chapter 2, Laws of 1989) and recommend how the ranking of sites with sediments that violate the sediment standards established under the Municipal and Industrial Discharges Program can be made consistent with the other programs. The study also shall identify and compare various funding sources for contaminated sediment area investigations, sediment site cleanup action feasibility studies, and actual cleanup actions and shall make recommendations on future funding. Contaminated sediment sites should also be ranked and investigated under a separate system that is comparable to the state and federal Superfund programs. Then funding from these programs may be available should sediment cleanup actions with public funds be necessary. The results of this study shall be used in updates of the site priority list called for in element 8.6.

Target Date: Complete initial ranking system study by June 1, 1990. Complete final ranking system by June 1, 1991.

[Status: Ecology has integrated this element into the development of a ranking method for sediment sites under the state's Model Toxics Control Act. Consultant studies are complete and the method is being developed into a computer model ranking system.]

8.6. Sediment Site Cleanup Actions

Following the guidelines developed under S-7, when sites with high levels of sediment contamination are identified, Ecology shall consider the feasibility and reasonableness of sediment cleanup actions, coordinating with DNR on actions that affect state-owned aquatic lands. Ecology, as part of this element, shall develop decision criteria for determining when sediment cleanup actions should be taken pursuant to water quality and discharge permit laws (sediment restoration activities) and when cleanup actions should be taken pursuant to the Model Toxics Control Act (sediment remedial actions). If sediment cleanup actions are necessary, funds for such actions will be sought first from responsible parties and then from public sources. All cleanup actions shall be consistent with the guidelines developed under element S-7. Ecology shall maintain a priority list of specific sediment sites where cleanup will be considered.

Target Date: Establish initial priority list of sites by January 1, 1992.

[Status: Because of a decision to adopt language about sediment cleanup standards as part of the sediment standards (P-2), Ecology has completed the conceptual design of how sediment station information will be used to identify sites, how sites will then be ranked, and the general factors to be used in selecting the legal authorities appropriate for each cleanup action. Additional work will be needed before a priority list is completed.]

8.7. Responsible Parties

The Authority recognizes that identifying the parties responsible for sediment contamination is generally difficult. Often neither the underlying property owner nor the abutting property owner is responsible for the contamination. But cases have occurred and will occur when responsible parties can be identified. Where treatment or removal of contaminated sediments is recommended, Ecology shall attempt to have such cleanup actions, including investigations and feasibility studies, undertaken and paid for by responsible parties whether they are dischargers under water quality laws or liable persons pursuant to the Model Toxics Control Act. DNR shall utilize state proprietary

authority to secure, to the extent possible, site cleanup, natural resource damages, and cost recovery from responsible parties whose contamination is located on state-owned aquatic lands. Every reasonable attempt will be made to recover cleanup costs from responsible parties including study costs.

Target Date: Ongoing activity.

[Status: Ecology and EPA are requiring responsible parties to undertake sediment cleanup actions in Commencement Bay.]

Education

S-9. Public Involvement/Education/Technical Assistance

Ecology shall increase staffing for public involvement for sediment program issues including sediment standards (P-2). A staff person will be assigned to coordinate Ecology public outreach and education on sediment issues and improve the response to technical inquiries. This element will be coordinated with the development of educational materials on sediments under element EPI-3.1.

Target Date: Establish staff position by December 1992.

[Status: This element has not been funded. Ecology's sediment management unit is providing some effort in this area.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Changes to PSDDA recommendations adopted by reference in element S-3.
2. Adoption of sediment management standards which include the sediment quality standards (P-2) and maximum allowed cleanup levels and site specific cleanup requirements (S-7, S-8.6).
3. Adoption of contaminated sediment disposal standards (S-4).
4. Priority list for contaminated sediment area investigations (S-8.2).

LEGISLATION REQUIRED

New legislation may eventually be required to allow the establishment of multi-user dredged material disposal sites.

ESTIMATED COST

The final 1989 plan requested \$3 million for the sediment program for the 1989-91 biennium. Actual funding was about \$1.8 million. Future cost estimates are for approximately \$4 million per biennium. Full funding for the same period would require over \$5 million per biennium. The program's largest cost in the future is the investigation and cleanup of contaminated sediments (element S-8). Between \$1.4 and \$1.9 million is being requested annually, as funds are shifted over to S-8 when other elements are completed. This would allow some progress on site investigations and source control but does not include public funds that might be needed to clean up contaminated sediments. Such costs could run \$100,000 per acre for removal or treatment and \$5,000 per acre for capping. Estimates of costs to dredge and dispose of sediment hot spots in Commencement Bay ranged from \$8 to \$79 per cubic yard depending on the type of disposal selected.

Large public and private sector costs are currently associated with dredging or disposal of dredged material. As recently as 1984 dredging and open water disposal of clean material cost only \$2 to \$3 per cubic yard. For the past few years testing of material suspected of being contaminated has cost an additional \$1 per cubic yard. In addition, disposal fees have increased and will increase more in the future. Disposal of dredged material that cannot go to open water now costs anywhere from \$15 to \$40 per cubic yard. Disposal of highly contaminated material, as discussed above for cleanup actions, has been estimated at up to \$79 per cubic yard. Since annual dredging volumes are in the hundreds of thousands of cubic yards, most of it clean material, these are significant costs for the region.

Private sector costs associated with investigating and dealing with contaminated sediments sites may also increase. This would occur when responsible parties are required to investigate and remedy sediment hot spots resulting from their discharges.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Contaminated Sediments and Dredging

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
S-2 Unconfined Disposal Planning	\$17,104	\$22,816	\$0	\$0	\$0
S-3 Unconfined Open Water Disposal Sites	\$0	\$0	\$6,322	\$6,322	\$0
S-4 Sediment Confined Disposal Standards	\$774,315	\$292,592	\$268,345	\$128,270	\$128,270
S-5 Revision of Rules and Programs	\$0	\$468,186	\$902,502	\$0	\$0
S-6 Multi-user Confined Disposal Sites	\$90,108	\$236,624	\$140,219	\$0	\$0
S-7 Guidelines for Remedial Actions	\$75,704	\$141,152	\$70,771	\$70,771	\$0
S-8 Investigations of Sediment Sites ²	\$478,545	\$982,744	\$2,939,424	\$3,700,940	\$3,900,940
S-9 Public Involvement	\$0	\$0	\$233,084	\$183,084	\$183,084
TOTALS	\$1,435,776	\$2,144,114	\$4,560,667	\$4,089,387	\$4,212,294

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Natural Resources	\$0	\$0	\$478,285	\$383,638	\$383,638
Department of Ecology	\$1,182,747	\$1,402,180	\$2,578,022	\$2,879,003	\$3,008,232
EPA Region 10	\$0	\$0	\$117,450	\$117,450	\$117,450
Local Governments	\$210,261	\$667,854	\$965,000	\$390,000	\$390,000
Puget Sound Water Quality Authority	\$42,768	\$74,080	\$18,966	\$6,322	\$0
Tribal Governments	\$0	\$0	\$260,000	\$260,000	\$260,000
Department of Fisheries	\$0	\$0	\$100,658	\$52,974	\$52,974
Department of Wildlife	\$0	\$0	\$42,286	\$0	\$0
TOTALS	\$1,435,776	\$2,144,114	\$4,560,667	\$4,089,387	\$4,212,294

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Centennial Clean Water Account	\$157,700	\$130,000	\$0	\$0	\$0
Federal Funding Sources	\$0	\$0	\$117,450	\$117,450	\$117,450
Local Funding Sources	\$52,561	\$537,854	\$965,000	\$390,000	\$390,000
Permit Fee	\$0	\$232,156	\$0	\$0	\$0
State General Fund	\$1,225,515	\$1,244,104	\$1,522,568	\$925,723	\$848,630
Toxics Accounts	\$0	\$0	\$1,695,649	\$2,396,214	\$2,596,214
Tribal Funding Sources	\$0	\$0	\$260,000	\$260,000	\$260,000
TOTALS	\$1,435,776	\$2,144,114	\$4,560,667	\$4,089,387	\$4,212,294

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Includes funding of UBAs, which are also funded in Municipal and Industrial Discharges element P-13.

STORMWATER AND COMBINED SEWER OVERFLOWS (CSOs) PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION

Combined Sewer Overflows (CSOs)



Nine cities¹ around Puget Sound have combined sewers where sanitary sewage, industrial wastewater, and stormwater are collected in a single sewer system. Metro, because it accepts wastewater for treatment from Seattle, handles wastewaters from combined sewers, although Metro owns no combined system. In a combined sewer system neither the pipes nor the sewage treatment plants are sized to carry all of the volume of combined wastewater, and during large storms some of the effluent is discharged directly to the Sound and adjacent waters without treatment.

Except for Metro and Seattle, basic information on frequency, quantity, and effects has been lacking for most CSOs discharging into Puget Sound. In an average year, Metro and Seattle discharge about 2.8 billion gallons of raw sewage, untreated stormwater, and industrial effluents from about 110 CSOs in the Seattle area. This volume is approximately six percent of the annual discharge from the West Point treatment plant. The Metro and Seattle discharge contains approximately five percent of the total annual load of biochemical oxygen demand (BOD) and total suspended solids discharged from the West Point sewage treatment plant. Although the volume of effluent of CSOs is relatively small compared to the discharge of sewage treatment plants, CSO discharges are untreated and are usually in close proximity to sensitive shoreline areas.

The discharge of raw sewage from CSOs contains high concentrations of fecal coliform bacteria, nutrients, and suspended solids. Sediment samples collected around the Denny Way CSO in Seattle have shown highly elevated concentrations of heavy metals and organic toxicants. These sediments have been capped by Metro recently. The biota around the CSO has also been adversely affected

¹ Anacortes, Bellingham, Bremerton, Everett, Mount Vernon, Olympia, Port Angeles, Seattle, and Snohomish.

by the discharge. Because the high numbers of fecal coliform bacteria in raw sewage indicate the presence of pathogens, areas around CSOs have been closed to swimming and shellfishing.

Until recently, the control of CSOs was given a low priority by federal and state agencies. Since the mid-1950s, EPA policy, and standard engineering practice, has been to install separate sanitary and storm sewers for newly developed areas. EPA will not fund construction of combined systems. Also, all CSOs are now regulated under the NPDES program with discharges required to meet all applicable requirements. With the passage of HB 815 by the Washington State Legislature in 1985, all municipalities with CSOs are required to develop plans for the greatest reasonable reduction at the earliest possible date. The legislation required submittal of CSO reduction plans to Ecology by January 1, 1988. All of the municipalities with CSOs are making efforts to control the overflows and have submitted plans to reduce them. These plans include locations, baseline annual frequency and volume, and some water quality and sediment sampling.

CSO control techniques have typically involved separation and/or storage. Separation involves construction of storm drainage systems which collect stormwater and discharge to natural waters. Storage means using tanks, vaults, oversized pipes, and related equipment and facilities to hold and store combined effluent for later discharge to the treatment plant. Typically, separation systems are the less expensive to construct of the two alternatives. Separated drainage systems will be consistent with applicable NPDES regulations and will be subject to stormwater management programs as mandated by the stormwater elements of the plan (SW-1 and SW-2).

Stormwater

Rainfall may evaporate, be transpired by plants, infiltrate into the ground, or run off into drainage courses that discharge into natural waters. Residential, commercial, and industrial land uses have a much higher volume of runoff than rural land uses. This is because urban land uses have a much higher percentage of impervious areas. Impervious areas are hard surfaces such as rooftops, driveways, streets, parking lots, and highways; even grass lawns are almost as impervious as some paving. Stormwater is defined as runoff from these land uses and is often called urban runoff.

In developed areas, certain pollutants are more prevalent than in undeveloped areas. Typically, contaminants include suspended solids, nutrients, bacteria, oils and grease, and metals and other toxicants. Many of these contaminants come from motor vehicles; others from applications of fertilizers, pesticides, or herbicides; pet feces; or poor management of various wastes.

Pesticides are a potential threat to water not only when they are disposed of improperly, but also when they are used improperly. Unlike other pesticide users, household users are not trained in proper application procedures or in diagnosing whether a particular pesticide is needed. Urban and suburban use of pesticides often occurs directly adjacent to pavement and storm drains, to ditches, or to streams and lakes. Pesticides applied incorrectly (either excessively, in highly concentrated formulations, or right before rainfall) can flow or leach as runoff into local waterways or seep into the groundwater.

The atmosphere in urban areas contains particles and associated contaminants from cars, factories, and wood stoves. When it rains, these particles—and pollutants—may be deposited on the water, or they may be deposited on the land and be washed into the nearest body of water—a stream, lake, or Puget Sound.

Stormwater is a significant source of the pollutants that have concentrated in sediments in several urban bays. Some storm drains in Seattle were found to be major sources of lead and PCBs found in the sediments of Puget Sound.

The potential for significant pollution from stormwater has been increasingly recognized in the past 10 years. Metro² detected six metals in all 78 samples collected in the Seattle area between 1980 and 1982: arsenic, cadmium, chromium, copper, lead, and zinc. Nickel was detected in over 50 percent of the samples. The average stormwater concentrations exceeded chronic water quality criteria for cadmium, copper, lead, nickel, and zinc. The concentrations of metals did not appear to be different among the three basic land use types sampled—residential, commercial, and industrial. Runoff from freeways, however, was consistently higher for most metals. Compared to effluent from secondary sewage treatment, urban runoff in Bellevue contained higher concentrations of lead and zinc. Average concentrations of total suspended solids, chemical oxygen demand, and nitrate/nitrite from the Nationwide Urban Runoff Program³ runoff data were higher than the annual mean concentrations in secondarily treated effluent from the Renton treatment plant.

Based on the known volume of discharge from municipal and industrial sources and the relative area of urban development in the Puget Sound basin, the quantity of pollutants contributed to the Sound and area waters from stormwater runoff is approximately equal to the contribution from municipal and industrial sources. As urbanization of the Puget Sound basin continues, the contribution of stormwater to the pollution of surface waters will become more severe—unless effectively managed. The projected urban growth in the Puget Sound basin is expected to add over a million people to the basin by 2010. This could dramatically increase the amount of toxicants discharged into Puget Sound from stormwater runoff, unless runoff and toxicants are effectively managed.

Construction activities contribute to the stormwater pollution problem because of the potential for erosion from construction sites. Local governments typically attempt to control erosion and sedimentation during construction by requiring certain techniques known as best management practices (BMPs). Proper application of appropriate BMPs can significantly reduce the amount of sediment leaving a site. Additionally, local governments often regulate the construction of drainage systems by requiring permits and reviewing designs. These processes are most effective in controlling erosion and the quality and quantity of runoff following development when utilized together.

Preventive measures such as drainage and land use regulations can stop problems before they occur. Examples include ordinances to limit development on sensitive features such as steep hillslopes, floodplains, and wetlands. Establishment of stream corridors and native growth protection easements protect water quality and fish habitat in natural drainage systems. Areas experiencing frequent flooding and erosion can be designated as critical areas subject to special restrictions that minimize impacts or improve conditions within a specific stream drainage basin.

2 Toxicants in Urban Runoff, Metro, 1982.

3 The Nationwide Urban Runoff Program was a five-year study (1978-82), sponsored by EPA and many cooperating federal, state, regional, and local agencies, which addressed the quality of urban runoff, the significance of the urban runoff problem, and the effectiveness of best management practices.

The primary effect of development on streams has been to increase both the volume and speed of peak flows. The resulting erosion, scouring, and deposition of sediment affect the ecological balance in the stream. Diversity of species decreases and more tolerant (and usually less desirable) species remain.

To date, drainage management has focused on controlling flooding problems. Detention basins are used to control the release rate of stormwater from developed properties. Stormwater is then discharged to surface water, groundwater (via infiltration systems), and/or combined sewers. Now many jurisdictions are considering both quality and quantity in surface water management. Traditional techniques to manage quantity offer opportunities to improve water quality; for instance, detention basins, while slowing the rate of flow, may also settle out particulates and associated pollutants.

Management of surface water may conflict with other management goals, including management of fisheries, groundwater, and wetlands. The potential for groundwater contamination from stormwater is significant. Seven of the 12 counties in the Puget Sound basin rely on groundwater for more than 75 percent of their domestic water supply. In urban areas, stream flows are higher than the natural rate in the wet season, because of the increased rate of runoff, and lower in the dry season because of the decrease in groundwater recharge resulting from covering the ground with impervious areas. Management of streams and rivers for stormwater conveyance may hinder the movements of migratory fish, both by obstructing their passage and by changing flows. Peak flows also scour gravel beds needed by migratory fish for spawning. Wetlands, both natural and artificial, are being used for storage and treatment of stormwater, with only limited knowledge of the effect of stormwater on wetland habitats.

Because most stormwater quality programs are just beginning, we do not know how successful they will be in keeping contaminants out of surface water and groundwater. Even if source controls and BMPs are considered successful, we still don't know whether the resulting water will be clean enough to fully protect Puget Sound from harm.

Stormwater pollution is a problem associated with land utilization and development and the common use of potential pollutants such as pesticides, fertilizers, petroleum products, and numerous others. The pervasiveness of the stormwater problem requires solutions from diverse segments of society—the development community, businesses, and individuals. Federal, state, and local governments may lead the way by defining control methods, leading educational and research efforts, conducting investigations, implementing controls in existing urban areas, and providing enforcement activity where necessary, but success in solving the problem will be a function of society-wide efforts. Local programs are needed to address stormwater problems. However, for those programs to successfully implement such large and diverse projects, a cooperative partnership of federal, state, and local funding is needed.

PROGRAM STATUS

Combined Sewer Overflows (CSOs)

With the passage of HB 815 (RCW 90.48.460-490) in 1985, all municipalities with CSOs were required to develop plans for the greatest reasonable reduction at the earliest possible date. The legislation required submittal of local CSO reduction plans to Ecology by January 1, 1988. Ecology established a new regulation (Chapter 173-245 WAC) to implement the law consistent with these requirements. The 1987 Puget Sound plan called for CSO reduction guidelines

by Ecology (SW-8) and CSO reduction plans by cities with CSOs (SW-9). Ecology's guidelines for the implementation of Chapter 173-245 WAC were completed in September 1987.

As of September 1990, the CSO reduction plans of Metro, Seattle, Everett, Olympia, and Bellingham had been approved by Ecology. The Bremerton and Snohomish plans had been submitted for approval. Ecology was negotiating consent orders with Mount Vernon and Anacortes, and has issued an administrative order to Port Angeles. The regulation provides that CSO reduction plans will be updated every five years.

In its report to the legislature on the implementation of HB 815,⁴ Ecology defined greatest reasonable reduction as one overflow per year at each CSO location. In addition, Ecology has negotiated interim goals of 75 percent and 79 percent reductions of CSO volumes systemwide over the next 20 years with Metro and Seattle, respectively. This will continue the effort to reduce discharges of raw sewage from all sources. In Metro's case, such efforts have resulted in a 90 percent reduction in raw sewage discharges since 1960.

As a specific example of actions to be taken under CSO reduction plans, Metro's Lander and Hanford CSOs in Seattle, which now discharge over 900 million gallons per year into the Lower Duwamish River close to its mouth in Seattle's Elliott Bay, will be corrected by late 1991.

Stormwater

Progress on the stormwater elements of the plan has included establishment of a stormwater unit at Ecology in early 1988 and the start of development of the highway runoff program at the Department of Transportation. As of December 1990, Ecology has nearly completed a stormwater technical manual, a rule for highway stormwater runoff, and model ordinances for local governments. The Puget Sound Wetlands and Stormwater Management Research Program, led by King County, has continued without funding from the plan. Independent development of stormwater management programs at the local level has made rapid progress.

A recent informal opinion from the Attorney General holds that Ecology lacks clear legal authority to direct local governments to adopt stormwater regulatory programs. The Attorney General, however, believes that the Authority has more authority to accomplish this task. Therefore, the plan provides for the Authority to adopt the stormwater rule. Ecology will adopt minimum standards for new development to accompany the rule. As of December 1990, the Authority and Ecology are nearing completion of the dual stormwater rules.

The federal Water Quality Act of 1987, which reauthorized the Clean Water Act, establishes new procedures, requirements, and deadlines for the regulation of stormwater discharges by municipal and industrial sources. Cities with populations greater than 250,000 are to submit the first part of an application for permits by November 1991, a second part of the permit applications by November 1992, and sources are to be in compliance by 1994. Cities with populations greater than 100,000 but less than 250,000 are given an extra six months to submit their two-part permit applications (May 1992 and May 1993,

4 The Status and Future of Combined Sewer Overflow Control, Washington Department of Ecology, September 1987.

respectively), and are to be in compliance by 1996. EPA will issue regulations for smaller sources by October 1992. The new law provides that permits for municipal discharges may be issued on a systemwide basis. The law also ~~includes a requirement effectively prohibiting~~ non-stormwater discharges to storm sewers. ~~It also~~ requires controls to reduce the discharge of pollutants to the maximum extent practicable.⁵ Industrial stormwater sources are ~~still~~ subject to BAT/BCT-based standards.⁶

Stormwater permitting requirements consistent with the new federal stormwater regulations are being developed under element P-5 of the Municipal and Industrial Discharge Program.

EPA has recently provided guidance documents for new initiatives in the Water Quality Act. "Nonpoint Source Guidance" describes how states should assess their waters to determine where uses are impaired by nonpoint sources (including stormwater) and develop nonpoint source management plans required under Section 319 of the Act.⁷ "State Clean Water Strategies: Meeting the Challenges of the Future"⁸ is intended to serve as an umbrella document for a number of initiatives⁸ and describes what EPA views as a rational process for states to use in satisfying their Water Quality Act requirements.

Stormwater is being addressed on a watershed basis through the plan's Nonpoint Source Pollution Program. Regulations adopted by the Authority (Chapter 400-12 WAC) encourage local development of management frameworks which will facilitate nonpoint source pollution management. Section 400-12-630 WAC specifically addresses stormwater and erosion management.

The Uniform Fire Code (UFC) can be used to control surface water runoff pollution. The UFC is adopted by reference in RCW 19.27A.010; the current version was adopted in November 1989 and went into effect in July 1990. Counties and cities are required to enforce the minimum provisions of the UFC. The 1989 Code, Article 80, Section 104(b) (Release of Hazardous Materials), says, "Hazardous materials shall not be released into any sewer, storm drain, ditch, drainage canal, lake, river or tidal waterway, or upon the ground, sidewalk, street, highway or into the atmosphere." This section gives local fire departments wide latitude to deal with inappropriate release and control of hazardous materials. Since all fire departments conduct regular inspections of commercial and industrial facilities, they can be particularly effective at detecting and correcting potential problems.

The Urban Bay Action Program, a joint effort by Ecology, EPA, and local agencies, has conducted source control programs in urban bays since 1985. Stormwater is one source of toxic contamination to many urban bays. The urban bay action teams have developed specific source control programs to control stormwater and other sources of toxic contamination in these bays (see element P-13).

5 A new standard from the Water Quality Act of 1987, 33 U.S.C. Section 1345 as amended by PL 100-4, Section 405.

6 Best Available Technology/Best Conventional Technology, as defined by the CWA.

7 33 U.S.C. Section 1251 et. seq., as amended by PL 100-4, Section 319.

8 Surface water toxics control, nonpoint source, estuary, clean lakes, and Great Lakes program areas.

At the local level, the trend has continued toward establishment of surface water utilities. Surface water utilities are currently in place in Anacortes, Auburn, Bellevue, Gig Harbor, Issaquah, Kent, Lacey, Mountlake Terrace, Olympia, Port Townsend, Poulsbo, Redmond, Renton, Seattle, Shelton, Steilacoom, Tacoma, Tumwater, Winslow, and portions of King, Snohomish, Pierce, and Thurston counties. Several other cities, including Bellingham, Bremerton, Kirkland, Marysville, and Mukilteo, are considering formation of utilities. Many more cities are reviewing and revising stormwater management policies, programs, and ordinances.

The Puget Sound Wetlands and Stormwater Management Research Program is a regional effort coordinated by King County to scientifically establish the short- and long-term effects of urban stormwater on regional wetlands and to determine the downstream water quality benefits which might be provided by the use of man-made wetlands to treat stormwater. While the bulk of the research is long-term and results will not be available for several years, a survey of the characteristics of upland wetlands both affected and unaffected by urban runoff as well as a literature review have been completed.

PROGRAM GOAL

To protect shellfish beds, fish habitat, and other resources, to prevent the contamination of sediments from urban runoff and combined sewer overflows, and to achieve standards for water and sediment quality by reducing (to the maximum extent practicable) pollutant discharges from stormwater and CSOs throughout Puget Sound.

STRATEGY

The strategy for achieving this goal is to (1) develop stormwater programs in urbanized areas of Puget Sound in a phased program starting with the largest cities; (2) require that all cities and counties develop operation and maintenance programs, adopt ordinances for new development, and develop stormwater education programs; (3) provide technical assistance through roving trainers who work at the local level; and (4) require all cities with CSOs in the Puget Sound basin to develop and implement plans providing for the greatest reasonable reduction of CSO events.

PROGRAM ELEMENTS

SW-1. Operation and Maintenance Programs and Runoff Ordinances: Stormwater Programs for All Counties and Cities

The basic program

All counties and cities in the Puget Sound basin shall adopt ordinances requiring stormwater controls for new development and requiring maintenance of public and private stormwater systems. These ordinances and maintenance programs shall meet minimum requirements which shall be set in a rule adopted by Ecology (see SW-4). The Authority shall adopt a rule to formalize this requirement. This program shall not affect Ecology's authority to require appropriate corrective action (pursuant to Chapter 90.48 RCW) whenever existing facilities cause or contribute to violations of state water quality standards.

Each county and city shall also develop operation and maintenance programs for new and existing public stormwater systems. Each county and city shall maintain records of new public and private storm drainage systems and appurtenances. Counties are responsible for the stormwater programs in unincorporated residential, commercial, and industrial areas. Ecology's guidelines will ensure that all appropriate areas are included in these programs. All programs

and ordinances developed under this element shall be consistent with the rules, guidelines, and model ordinances in elements SW-3 and SW-4. Each city and county shall adopt ordinances consistent with the model ordinances (SW-4) requiring stormwater quality and quantity controls for new development and requiring and enforcing maintenance of privately owned stormwater systems. Education programs to inform citizens about stormwater and its effects on water quality, flooding, and fish/wildlife habitat, and to discourage dumping of waste material or pollutants into storm drains, are included in the Education and Public Involvement Program (EPI-2.1 and EPI-2.3) and the Household Hazardous Waste Program (HHW-1 and HHW-2). The Household Hazardous Waste Program (HHW-2) and the Nonpoint Source Pollution Program (NP-17) also provide education to reduce the likelihood of pesticides entering stormwater systems.

Each city or county which adopts a comprehensive land use plan and development regulations under the provisions of Section 4 of SHB 2929 (the Growth Management Act, Chapter 17, Law of 1990, 1st ex. sess.) **shall incorporate the goals of the local stormwater program into the goals of the comprehensive plan and shall incorporate the ordinances required by this element into the development regulations.**

Ecology shall monitor compliance with these requirements, reviewing each city's and county's operation and maintenance and runoff control program every two years to ensure consistent and adequate implementation and report to the Authority. Ecology's oversight role shall pertain only to compliance with the objectives of the plan's stormwater program and appropriate rules and statutes and technical suggestions to improve implementation. This should ensure maximum flexibility and creativity for local governments to resolve site-specific stormwater problems in accordance with their land use and other local policies. If local governments fail to prepare and implement the required programs under this element, the Authority shall follow procedures in RCW 90.70 and in element EM-8 of the plan. The status of the stormwater ordinances and maintenance programs and the effectiveness of Ecology's focus on assistance in implementation instead of inspections and enforcement shall be evaluated by the Authority as part of the 1994 Puget Sound Water Quality Management Plan.

Target Date: **All cities and counties shall adopt ordinances and comply with the operation and maintenance program requirements by May 1, 1993.** By the same date, cities and counties with ordinances and operation and maintenance programs predating Ecology guidance under element SW-4 shall bring their ordinances and programs into compliance with the standards or provisions adopted in the rule (SW-4). Cities and counties shall comply with the operation and maintenance requirements on a phased schedule as designated by the Authority. By May 1, 1995, Ecology shall complete the first round of biennial reviews.

[Status: This program has been delayed by underestimates in the amount of time required to draft the guidelines and model ordinances (SW-4) and the technical manuals (SW-3), and by questions concerning Ecology's legal authority to adopt portions of the rules contemplated under element SW-4. The current schedule will give local governments approximately two years to develop their programs and adopt ordinances.]

**SW-2. Comprehensive
Urban Stormwater
Programs: Stormwater
Management
Programs for
Urbanized Areas⁹**

*"Comprehensive
side"*

Starting with six of the larger cities in the basin and four other cities or unincorporated or watershed areas¹⁰ and eventually expanding to cover all urbanized areas, each city and unincorporated urbanized area shall develop and implement a stormwater management program consistent with the rules promulgated under SW-4. This program shall not affect the Department of Ecology's authority to require appropriate corrective action (pursuant to Chapter 90.48 RCW) whenever existing facilities cause or contribute to violations of state water quality standards. The stormwater program shall be submitted to the Authority for approval. Ecology will schedule submittal of stormwater management programs to the Authority by the remaining cities and counties.

Cities and counties which adopt comprehensive land use plans and development regulations under the provisions of Section 4 of SHB 2929 shall incorporate stormwater management programs developed under this element into the land use language of their comprehensive plans and shall incorporate the ordinances required by this element into the development regulations.

The purposes of the management program shall be:

1. To control erosion and manage the quantity and quality of stormwater runoff from public and private activities;
2. To protect and enhance water quality, and achieve water quality and sediment quality standards;
3. To reduce the discharge of pollutants to the maximum extent practicable;
4. To protect beneficial uses, as described in Chapter 173-201 WAC; and
5. To achieve items 1 through 4 above in a manner that makes efficient use of limited resources to address the most critical problems first.

Each urban stormwater program shall seek to control the quality and quantity of runoff from public facilities and industrial, commercial, and residential areas including streets and roads. Each program shall cover both new and existing development. Early action by urbanized areas which are prepared to implement stormwater control programs shall be allowed. Emphasis shall be placed on controlling stormwater through source controls and best management practices. In some cases, significant stormwater problems may be originating in urbanized areas outside of a local jurisdiction. In those situations, the sequencing of areas for urban stormwater programs may be modified to address problems in shared watersheds. The neighboring jurisdictions will develop local coordination mechanisms to cooperatively resolve the identified problems. Where joint programs are not developed, Ecology shall ensure consistency in programs through its oversight role.¹¹

⁹ Urbanized areas are as defined by the United States Bureau of the Census. Counties are responsible for the comprehensive urban stormwater programs (SW-2) in unincorporated urbanized areas. Ecology will ensure that all appropriate areas are included in these programs.

¹⁰ The six cities are Seattle, Tacoma, Bellevue, Everett, Bellingham, and Bremerton. The four other areas will be selected by Ecology following a procedure which ranks local jurisdictions against objective criteria such as density and population size.

¹¹ The priority watershed process (elements NP-2, NP-3, and NP-4) would require joint efforts.

The urban stormwater programs shall be based on minimum standards contained in the technical manuals, model ordinances, rules, and guidelines developed in SW-3 and SW-4. Ecology shall provide technical assistance to the cities and counties developing and implementing stormwater programs. Ecology will coordinate its stormwater program development with other state programs which have stormwater implications, i.e., wetlands, floodplain management, nonpoint, underground injection control, and the sediment quality criteria development program. Ecology will comply with applicable NPDES regulations which may be used to implement urban stormwater programs. Each city or urban area will have the flexibility to design its own program to be phased in over several years, but the content, priorities, and deadlines for compliance with the program shall be subject to review and approval by the Authority.

At a minimum, each urban stormwater program shall include:

- a. Identification of potentially significant pollutant sources and their relationship to the drainage system and water bodies.
- b. Investigations of problem storm drains, including sampling.¹²
- c. Programs for operation and maintenance of storm drains, detention systems, ditches, and culverts.¹³
- d. A water quality response program, to investigate sources of pollutants, spills, fish kills, illegal hookups, dumping, and other water quality problems. These investigations should be used to support compliance/enforcement efforts.
- e. Assurance of adequate local funding for the stormwater program through surface water utilities, sewer charges, fees, or other revenue-generating sources.
- f. Local coordination arrangements such as interlocal agreements, joint programs, consistent standards, or regional boards or committees.
- g. Ordinances requiring implementation of stormwater controls for new development as defined by SW-3 and SW-4.
- h. A stormwater public education program aimed at residents, businesses, and industries in the urban area.
- i. Inspection, compliance, and enforcement measures.¹⁴
- j. An implementation schedule.
- k. If, after implementation of the control measures listed in a-j above, there are still discharges that cause significant environmental problems, retrofitting of ex-

¹² The Elliott Bay Revised Action Program: Storm Drain Monitoring Approach, March 1988 (draft), Tetra Tech, for EPA Region 10 presents an approach particularly suited to industrial areas.

¹³ Items c and g are parts of the areawide stormwater programs (SW-1), but may be developed under SW-2 by those cities and counties which proceed directly with the comprehensive stormwater program.

¹⁴ Local governments may request Ecology's assistance with enforcement measures.

isting development and/or treatment of discharges from new and existing development may be required.

Stormwater quality in public stormwater systems in commercial and industrial areas shall have a high priority in city and county programs. Ecology shall determine, in compliance with EPA regulations, and in consultation with local governments, the appropriate approach to controlling stormwater discharges from industrial and commercial facilities which are not currently required to have point source discharge permits. Stormwater controls are included in NPDES permits for discharges of stormwater from commercial and industrial point source facilities, which are addressed in the Municipal and Industrial Discharges Program (P-5).

Ecology shall have oversight responsibilities for the urban stormwater programs, pursuant to the Authority's rule. Ecology shall review each urban stormwater program every two years to ensure consistent and adequate implementation and report to the Authority. If local governments fail to prepare and implement urban stormwater programs, the Authority shall implement the process in RCW 90.70 and element EM-8 of the plan to encourage their compliance. The effectiveness of the urban stormwater programs and Ecology's focus on assistance in implementation instead of inspections and enforcement shall be evaluated by the Authority as part of the 1994 Puget Sound Water Quality Management Plan.

Ecology shall participate with Bellevue in a pilot areawide stormwater permit process intended to result in issuance of an areawide stormwater permit to Bellevue at the earliest possible date. The purpose of this permit process is to gain experience with use of the permit to implement the urban stormwater programs.

Urban stormwater programs may be part of the priority watershed action plans (NP-2 and -4).

Jurisdictions which annex an area from another jurisdiction must manage stormwater runoff consistent with the standards designated for the area prior to the annexation. Any new development or retrofitting of existing systems shall meet the most stringent standards. Areas that incorporate shall adopt standards at least as strict as those in place prior to incorporation.

Target Dates: By May 31, 1991, the six named cities and another four cities or unincorporated designated areas begin developing stormwater programs. By the year 2000, all urbanized areas in the Puget Sound basin implement urban stormwater programs. Ecology shall review each city or county program for substantial progress toward implementation of the elements listed above within two years of its initiation and report to the Authority.

[Status: Since the 1989 plan was adopted, most urban cities and counties have expanded their stormwater programs. Ecology is working with local governments in the development of these programs to ensure that the direction of local programs is compatible with upcoming standards. Ecology is in the process of developing a draft areawide stormwater permit for Bellevue. This permit will include monitoring requirements and numerical standards for certain pollutants. This permit has been delayed because of legal issues related to whether or not detention/retention systems are defined as waters of the state.]

SW-3. Technical Manuals and Assistance on Stormwater and Erosion Controls

3.1. Manuals

Ecology shall produce technical manuals for use by local jurisdictions in stormwater planning. In preparing these manuals Ecology shall use existing information. The technical manuals shall define minimum standards for inclusion in local programs (SW-1 and SW-2). The technical manuals shall include, but are not limited to:

- a. Best management practices for the control of erosion and sedimentation from construction sites, including standards for operation, maintenance, and inspection procedures.
- b. Hydrologic analysis procedures, including selection of design storms and estimation of runoff.
- c. Design, operation, and maintenance standards for public and private retention/detention facilities and conveyance systems. Emphasis is to be placed on systems which will maximize water quality benefits as well as water quantity control, such as the inclusion of biofiltration techniques where practicable.
- d. Techniques for the reduction or elimination of pollutants in runoff from problem land uses.

The development of these manuals shall be closely coordinated with the development of the guidelines and model ordinances for stormwater programs (SW-4). Ecology shall also update these manuals as needed and provide technical assistance in interpretation of these manuals to local jurisdictions.

3.2. Local Government Stormwater Assistance Service

The intent of this subelement is to provide technical assistance to local governments through people who have up-to-date hands-on experience with (1) the design and implementation of stormwater programs at the local level; and (2) current best management practices for stormwater, and who are familiar with the local basin characteristics. Ecology shall work with specific county and/or city governments with current stormwater expertise to establish a technical assistance service which will support the exchange of technical information and assistance on stormwater among local governments, will train Ecology and local government staff in current practices and real world application and problems in stormwater technology, and will operate as an integral part of the state technical assistance program. The service will have the goal of acting as an in-the-field branch of Ecology's technical assistance program.

Ecology shall develop training programs and materials for those local governments that have staff to carry out the stormwater programs. Ecology shall also provide specially trained technical assistance staff that act as roving trainers to work among jurisdictions to provide assistance for program development and implementation. These roving trainers will focus on local governments that do not have staff to develop stormwater programs and smaller jurisdictions experiencing high growth. The roving trainers will also be available to any local government for technical assistance as resources allow. In addition, Ecology and the American Public Works Association Stormwater Managers Committee,

in consultation with local governments and other appropriate stormwater experts, shall develop a list of local government and private sector staff with expertise in each aspect of stormwater planning, design, implementation, inspection, and maintenance who could provide technical assistance to local governments. The list of experts will be distributed to local governments.

Ecology, in consultation with local governments, the Association of Washington Cities, the Washington State Association of Counties, the Center for Urban Resources Management, the County Road Engineers Group, and other interested parties, shall develop curriculum for training courses for local government and Ecology staff. Training will include explanation of state requirements, development and implementation of local programs, and use of the state technical manual. Ecology shall provide the training and shall contract with local government experts to provide additional information on in-the-field problems and solutions to current control techniques. Ecology shall investigate incorporating some of these courses into the state educational system.

Ecology technical assistance staff shall receive training in stormwater control techniques and implementation including all training courses designed for local government. Local governments with significant experience in stormwater management shall provide in-the-field training on implementation of stormwater projects and basin characteristics for the technical assistance staff. Ecology and Fisheries shall provide basic training for these staff in wetlands and fisheries issues and programs.

The technical assistance staff will: (1) assist Ecology in training of local staff both in program design and implementation and in permit review and inspection for local checks on compliance; (2) provide feedback and updates on technical manuals and changes in regulations; (3) share current information among local governments; (4) identify issues and solve problems related to the development and implementation of the local stormwater programs; (5) and provide assistance when possible to the Puget Sound Cooperative River Basin Team (NP-6). The roving trainers will provide review of and assistance with program-wide implementation. They will not inspect individual sites for enforcement of regulations.

Target Dates: Ecology shall complete the technical manuals and prepare the list of experts by May 1991. Ecology shall establish the local government assistance service by December 31, 1991.

[Status: A stormwater unit was established at Ecology in January 1988. A draft manual was circulated for technical review in June 1990. Ecology staff is already providing technical assistance on site-specific stormwater problems.]

SW-4. Rules, Guidelines, and Model Ordinances for SW-1 and SW-2

Ecology shall prepare and update guidance, consisting of a rule, guidelines, and model ordinances, for stormwater programs for all cities and counties (SW-1) and for comprehensive urban stormwater programs (SW-2).¹⁵ The Authority shall adopt a rule which requires that all cities and counties adopt stormwater programs which include minimum requirements for new development set by Ecology by rule.

¹⁵ Regulations for stormwater discharges requiring permits are addressed under the Municipal and Industrial Discharges Program elements P-3 and P-5.

The Authority and Ecology shall consult with cities, counties, the Association of Washington Cities, the Washington State Association of Counties, the Municipal Government Research Center, developers, citizens' groups, and other interested parties as it develops the rules, guidelines, and model ordinances. The rules and guidelines shall provide minimum program requirements and shall be consistent with NPDES requirements. Ecology shall develop, as appropriate, additional supplemental guidance for stormwater programs to remain consistent with applicable NPDES requirements. The model ordinances shall be developed with local government assistance and shall be accompanied by useful methods and examples which will assist local governments in adopting these minimum requirements into their regulations. Ecology shall also provide technical assistance to local jurisdictions (SW-3) during preparation and implementation of their stormwater programs.

Ecology's Financial Assistance Program shall ensure that stormwater-related projects are awarded state grants only if they are consistent with the goals of this program and include design elements that implement best management practices consistent with Ecology guidelines. The Authority encourages Ecology to offer financial assistance to projects that meet these criteria.

4.1. Guidance for SW-1 and SW-2

The rules and supplemental guidelines for SW-1 and SW-2 shall include:

- a. Procedures for developing local programs, including procedures for review and approval of programs.
- b. Minimum requirements for runoff controls and system maintenance required in local ordinances.
- c. Minimum requirements for control of private sector maintenance of private drainage systems.
- d. Minimum requirements for the operation and maintenance programs, including record-keeping requirements for new drainage systems and facilities.
- e. Methods for assuring practical and appropriate disposal procedures for decant water, solids, and other substances from drainage system cleanout and maintenance. Methods shall address catch basins, oil/water separators, pipelines, swales, detention/retention basins, and other appropriate drainage elements.

Additionally, the rules and supplemental guidelines for the comprehensive urban stormwater programs (SW-2) shall include:

- f. Procedures for identification of potentially significant pollutant sources and their relationship to the drainage system and water bodies.
- g. Procedures for source tracing investigations, including sampling of problem storm drains.
- h. Procedures for investigations, implementation of spill control measures, enforcement, and remedial actions.
- i. Methods for assuring adequate local funding for the urban stormwater program.

- j. Provisions for agreements with neighboring jurisdictions when stormwater and watersheds do not follow jurisdictional boundaries.
- k. Requirements for public education programs.
- l. Requirements for retrofitting and/or treatment measures, if necessary.
- m. Procedures for inspection, compliance, and enforcement measures.
- n. Requirements for implementation schedules.

The rules and supplemental guidelines shall lay out acceptable approaches to control stormwater from new development, such as water quality policies for use in SEPA, NPDES, and other permit decisions; density controls to limit development in sensitive areas; development standards to limit the amount of impervious surfaces; regional detention ponds; oil separators or other treatment facilities; grading and drainage ordinances; erosion control programs; buffers next to waterways; preservation of wetlands; and other appropriate elements.

In the rules and supplemental guidelines for SW-1 and SW-2, Ecology shall address the issue of responsibility and procedures for dealing with direct discharges of stormwater from industrial and commercial facilities into the waters of the state.

4.2. Model Ordinances

The model ordinances for elements SW-1 and SW-2 are intended to describe how local governments can meet or exceed the minimum standards local governments must adopt, and shall include at least the following elements:

1. A drainage element which (a) sets policy; (b) defines the role of surface water management; (c) defines water quality criteria and standards; (d) provides local enforcement authority; (e) provides for inspection and maintenance of private drainage facilities; (f) authorizes administrative development of operation and maintenance standards, development standards, and spill response procedures; and (g) generally integrates the management of surface waters with other appropriate codes affecting water quality (i.e., the Uniform Fire Code, public health codes, and land use codes).
2. A clearing and grading element which specifies erosion-control authority and provides for inspection and enforcement.
3. An element ensuring protection of streams and wetlands that is consistent with Ecology standards and policies developed under plan elements W-4 and SW-7.

Target Date: Ecology completes the rules, guidelines, and model ordinances including an interim policy for handling and disposal of generated waste by November 1, 1991.

[Status: A stormwater unit was established at Ecology in January 1988. Ecology submitted an evaluation of rules versus guidelines on February 1, 1989.]

SW-5. Puget Sound Highway Runoff (WSDOT)

The Washington State Department of Transportation (WSDOT) shall develop a program to control runoff from freeways and highways in the Puget Sound basin. This program shall be consistent with the Ecology rule discussed below.

Ecology shall adopt a rule for the Puget Sound Highway Runoff Program and shall coordinate with WSDOT in its development of a runoff program. During preparation of this rule, Ecology shall consult with WSDOT, other appropriate Ecology programs, the Authority, tribal governments, and affected local jurisdictions. Ecology shall provide technical assistance to WSDOT and local jurisdictions during development and implementation of this program.

The rule shall include requirements for:

- a. Control and/or treatment of runoff from highways in the Puget Sound basin.
- b. Implementation of BMPs and/or treatment facilities for new construction.
- c. The use of BMPs addressing water quality and quantity control, the use of pesticides in highway rights-of-way, and the use of de-icing chemicals.
- d. Compliance with Ecology and local stormwater programs. Ecology shall seek to provide consistent requirements for the highway program in different jurisdictions.
- e. Phasing in the runoff program. A priority ranking system will be developed in consultation with Ecology and local and tribal governments for retrofitting water quality BMPs which will factor in vehicle use and site-specific constraints of implementing best management practices. Additional criteria may be considered. Opportunities for public involvement in the process shall be provided.
- f. WSDOT funding of construction and operation and maintenance of local or private stormwater systems receiving highway runoff. Such funding shall be in accordance with RCW 90.03.525. WSDOT is encouraged to negotiate its appropriate share of specific or private stormwater facilities receiving highway runoff, as allowed for in RCW 90.03.525.
- g. Determining site-specific constraints in implementing best management practices and/or treatment measures for existing highways.
- h. An implementation schedule.

To clarify the requirements needed for (f) the Authority shall request a formal opinion from the Attorney General on whether RCW 90.03.525 allows local governments to negotiate with WSDOT to be reimbursed for stormwater management costs that exceed 30 per cent of the rate for comparable real property.

Target Date: The Department of Transportation shall adopt its highway runoff program within six months of adoption by Ecology of final rules. Ecology shall complete the final rule by June 30, 1991. A formal opinion from the Attorney General on RCW 90.03.525 shall be provided to the Authority by December 30, 1991.

[Status: A highway runoff unit was established in WSDOT in March 1988 and a similar unit in Ecology in May 1988. Both units have been working on the program. Ecology has prepared a draft rule. The program has been delayed because the negotiations and consultations required among Ecology, WSDOT, and local and tribal governments were more time-consuming than anticipated. WSDOT will prepare a programmatic EIS on its roadside pesticide use policy for the state.]

SW-6. Runoff from Federal Facilities

As part of the state certification process under Section 401 of the federal Clean Water Act, Ecology shall require that all NPDES permits for federal facilities, including military bases, written by EPA contain stormwater controls that (1) are at least as stringent as those required for industrial facilities in Municipal and Industrial Discharges Program element P-5, including all toxicant and particulate limits and requirements for monitoring, spill control, and public notice; and (2) are consistent with the wetlands protection policies under plan elements SW-7 and W-4. EPA shall review existing EPA-issued permits and modify any permit as necessary to include such limits and requirements. (See Municipal and Industrial Discharges Program elements P-5 through P-11.) Before considering a Clean Water Act Section 401 certification for a federal facility permit, Ecology shall seek to be familiar with the facility site through joint site visits or inspections with EPA or through other means (for discharges of wastewater from federal facilities, see Municipal and Industrial Discharges Program element P-11).

Target Date: Ecology shall initiate this program on January 1, 1987. After September 30, 1987, Ecology shall not certify the renewal of any NPDES permit for a federal facility under Section 401 of the Clean Water Act unless the permit includes numerical limits and/or other conditions required to comply with all applicable water quality and sediment standards and other elements of this plan.

[Status: No federal facility permits have been issued since the 1989 plan.]

SW-7. Stormwater-Related Research

7.1. Stormwater-Wetlands Research

Using the expertise in the state universities and local governments as appropriate, Ecology shall continue to fund and participate in research on short- and long-term impacts of stormwater quality and quantity on wetland values and functions. Ecology shall cooperate with state and local agencies that are participating in the Puget Sound Wetlands and Stormwater Management Research Program developed by King County and the Urban Water Resources Management Program. Ecology shall encourage a research program designed to obtain the data necessary to develop and support policy and regulatory decisions regarding water quality and the management of stormwater discharges entering wetlands that are consistent with wetlands protection in element W-4. If they become available before completion of SW-3 and SW-4, results from this research shall be integrated in the development of the technical manual (SW-3) and the rules (SW-4).

7.2. Stormwater Research Needs

Ecology shall conduct a comprehensive search of the literature to identify and rank stormwater research needs, in collaboration with the Research Program (see element R-1), and report the results.

7.3. Stormwater, Wetlands, Fisheries, Growth Policy Assessment

The Authority shall form a temporary Policy Assessment Workgroup to prepare an assessment of the federal, state, and local policy mandates pertaining to stormwater management, wetlands protection, and fishery protection and enhancement. The assessment shall be developed in consultation with EPA; the state departments of Ecology, Transportation, Fisheries, Wildlife, Natural Resources, and Community Development; and local and tribal governments in an attempt to develop a consensus policy that addresses competing program

mandates. This assessment shall include proposed solutions and implementation mechanisms for timely resolution of all such competing mandates identified.

Target Date: Ecology shall participate in the wetlands research project which commenced on January 1, 1987. The Authority shall form the Policy Assessment Workgroup by March 31, 1991, and complete an implementation plan and schedule by September 30, 1991.

[Status: The research project is proceeding with funding from King County, Metro, the federal Coastal Zone Management Program, and the Centennial Clean Water Fund. Seven guide sheets have been produced, along with the fourth draft of guidelines for wetlands and stormwater management.]

COMBINED SEWER OVERFLOW

SW-8. CSO Reduction Guidelines

The Authority recognizes that Ecology is nearing completion of guidelines for local planning to achieve greatest reasonable reduction of CSOs. The goal of the guidelines shall be to achieve the greatest reasonable reduction of pollutants from both stormwater and sanitary sewage in CSOs. If local governments choose stormwater separation as a CSO reduction technique, best management practices, including a source control program, shall be required and the impacts of stormwater on receiving waters shall be monitored by the municipality as required by Ecology. Ecology shall also update the guidelines and provide technical assistance to local governments implementing the guidelines (SW-9).

[Status: Ecology completed the regulations for CSO reductions (Chapter 173-245 WAC) in January 1987 and the guidelines for implementation in September 1987. EPA recently approved Washington's CSO program.]

SW-9. CSO Reduction Plans by Cities (or Sewer Districts)

As required by RCW 90.48.480, each city, sewer jurisdiction, or other entity with CSOs¹⁶ shall submit to Ecology a plan to achieve greatest reasonable reduction of CSOs consistent with Ecology guidelines. The plans will include priority ranking of CSOs, implementation schedules, and provisions for funding of the corrections. Ecology will review the plans, develop compliance schedules, and modify NPDES permits.

Target Dates: Cities with CSOs were to submit CSO reduction plans to Ecology for approval by November 1, 1987. Ecology was to approve or disapprove of the plans by January 1, 1988. The controls are to be implemented according to a compliance schedule negotiated between Ecology and each jurisdiction. Ecology will review and approve or disapprove plans as they are submitted by local agencies.

[Status: Metro, Seattle, Everett, Olympia, and Bellingham had their CSO plans approved by Ecology. The Bremerton and Snohomish plans have been submitted for

¹⁶ Deadline set by current state law. All CSO deadlines in this program are based upon the need to comply with current state law requiring CSO reductions. Cities known to have CSOs and therefore affected by this requirement are Seattle (and Metro), Anacortes, Bellingham, Bremerton, Everett, Mount Vernon, Olympia, Port Angeles, and Snohomish.

approval. Ecology is negotiating consent orders with Mount Vernon and Anacortes, and an administrative order has been issued to Port Angeles.

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Ecology guidelines for urban stormwater programs (SW-4).
2. Authority adoption of stormwater rule (SW-4).
3. Program for Puget Sound highway runoff (SW-5).
4. Ecology CSO guidelines (SW-8) (completed).

LEGISLATION REQUIRED

None.

ESTIMATED COSTS

Stormwater and Combined Sewer Overflows (CSOs)

The costs to the state for the stormwater and CSOs program are estimated to be \$4.4 million for the 1991-93 biennium. These costs are reduced approximately 30 percent from a full program budget resulting in emphasis on implementation of the regionwide stormwater program (SW-1) and slower implementation of the comprehensive urban stormwater programs. Local costs are estimated to be \$2.5 million in biennium 1991-93, increasing to \$8.7 million, and then to \$15.2 million in subsequent biennia. For planning purposes, the local costs are considered to be the incremental, or additional, cost of providing water quality programs above and beyond other drainage activities, typically oriented towards water quantity (i.e., flood) control. Some local governments contend that the costs for implementing the plan's stormwater program should be much higher. The Authority's estimates assume that about 20 percent of the total costs of a comprehensive stormwater/drainage program are the incremental costs related to water quality, while about 80 percent are attributable to water quantity (flooding and drainage) costs. The Authority's cost estimates for the plan budget include only the 20 percent related to water quality.

Although some of the local costs may be supported by the Centennial Clean Water Fund, the bulk of the costs are expected to be funded through the formation of drainage or utility districts. Comprehensive control of stormwater from non-NPDES permitted industrial or commercial facilities is a potentially expensive task, not currently included in cost estimates for the stormwater or municipal and industrial discharges programs. Once permit requirements are determined for these discharges, costs will be able to be estimated as part of the Municipal and Industrial Discharges Program.

CSOs

The CSO control programs are expensive. Metro, Seattle, and Everett estimated the costs of eliminating their CSOs, and Ecology did the same for other cities. Over the next 18 years these costs are estimated to be \$223 million. Total costs for these cities to control CSOs to the ultimate goal of one overflow per year is approximately \$425 million, of which \$289.5 million is for Metro. These costs are a result of existing legal requirements; this plan does not impose new requirements on CSOs.

Urban Stormwater Program

An informal survey was conducted in 1988 of local stormwater management programs, including all of the drainage utilities which could be identified. The survey included King, Skagit, and Snohomish counties, and Anacortes, Auburn, Bellevue, Bellingham, Kent, Lacey, Mountlake Terrace, Olympia, Port Townsend, Poulsbo, Redmond, Renton, Seattle, Shelton, Steilacoom, Tacoma, Tumwater, and Winslow. Many of these cities and counties have already completed several elements of the urban stormwater program. Local governments which already have vigorous stormwater programs underway would be expected to have less of an increase in costs than those with only minimal programs. The total budgets for drainage and stormwater functions currently in place by the jurisdictions surveyed was approximately \$35.3 million. An extrapolation of this figure to the region indicates an annual budget of \$50 million to \$160 million to perform current functions, which typically include drainage operation and maintenance, capital improvements, comprehensive drainage planning, and drainage-related permitting for property development. Given the tendency of most local surface water management programs to emphasize flood control rather than water quality control, some additional costs would be incurred by virtually all local governments to implement water quality programs.

Because source controls and best management practices are emphasized before treatment, the costs to local government may not be as significant as they would be if treatment were required. There will, however, be costs for operation and maintenance of systems, remedial actions, public education, and the other elements of the comprehensive stormwater management programs.

Operation and Maintenance Programs and Runoff Ordinances

Because there are fewer requirements, the costs for the regionwide stormwater programs to be developed by all cities and counties (SW-1) will be less than the urban stormwater programs (SW-2). Also under the regionwide stormwater programs, the cities and counties will have to review or adopt ordinances for maintenance of privately owned stormwater systems.

Highway Runoff Program

The Washington State Department of Transportation (WSDOT) estimates that it would cost \$50 million to implement stormwater controls on all state highways in the Puget Sound basin.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Stormwater and Combined Sewer Overflows

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
SW-0 Coordination	\$0	\$50,574	\$181,014	\$181,014	\$181,014
SW-1 Maintenance Programs and Ordinances	\$0	\$1,736,000	\$2,165,252	\$3,820,924	\$5,843,952
SW-2 Urban Stormwater Management Progs	\$2,800	\$681,112	\$991,623	\$6,184,222	\$10,572,078
SW-3 Technical Manuals and Assistance	\$150,363	\$250,626	\$729,084	\$1,211,420	\$1,450,027
SW-4 Rules and Guidelines for SW Progs	\$169,540	\$217,556	\$26,119	\$0	\$0
SW-5 Puget Sound Highway Runoff Prog.	\$74,660	\$197,938	\$2,584,789	\$3,477,692	\$3,477,692
SW-6 Runoff from Federal Facilities	\$81,133	\$101,232	\$44,952	\$44,952	\$44,952
SW-7 Stormwater-Related Research	\$15,069	\$0	\$134,939	\$114,308	\$114,308
SW-9 CSO Reduction Plans	\$204,473	\$230,910	\$143,084	\$143,084	\$143,084
TOTALS	\$698,038	\$3,465,948	\$7,000,856	\$15,177,616	\$21,827,107

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
WA Department of Transportation	\$0	\$84,750	\$2,438,128	\$3,334,608	\$3,334,608
Department of Ecology	\$639,326	\$828,344	\$1,968,031	\$3,000,788	\$3,202,647
EPA Region 10	\$33,200	\$33,200	\$23,490	\$23,490	\$23,490
Local Governments	\$0	\$2,400,000	\$2,507,990	\$8,780,800	\$15,228,432
Puget Sound Water Quality Authority	\$25,512	\$119,654	\$63,217	\$37,930	\$37,930
TOTALS	\$698,038	\$3,465,948	\$7,000,856	\$15,177,616	\$21,827,107

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
State Capital Funds	\$0	\$0	\$1,461,376	\$2,111,376	\$2,111,376
Federal Funding Sources	\$33,200	\$50,112	\$23,490	\$23,490	\$23,490
Local Funding Sources	\$0	\$2,400,000	\$2,507,990	\$8,780,800	\$15,228,432
Motor Vehicle Fund	\$0	\$84,750	\$976,752	\$1,223,232	\$1,223,232
Permit Fee	\$0	\$39,300	\$0	\$0	\$0
State General Fund	\$664,838	\$891,786	\$2,031,248	\$3,038,718	\$3,240,577
TOTALS	\$698,038	\$3,465,948	\$7,000,856	\$15,177,616	\$21,827,107

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

LABORATORY SUPPORT PROGRAM

PROGRAM ELEMENT DIRECTORY

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PROBLEM DEFINITION



Many of the programs in this plan, such as monitoring and shellfish protection, depend on accurate and timely laboratory analyses. Labs provide information on the presence, concentrations, and effects of contaminants in Puget Sound. Lab information will be needed to design programs to remedy the effects of contaminants and prevent or limit future contamination.

Many lab analyses are conducted pursuant to federal, state, or local laws designed to prevent degradation of water quality and threats to human health. For example, the Clean Water Act requires routine monitoring of municipal and industrial wastewater discharges. Ecology and EPA rely on lab results to assess compliance with the law and specific permit requirements, and to determine whether enforcement action is necessary. The Department of Health relies on results of water quality and shellfish tissue analyses to determine whether fecal coliform bacteria levels are within specific levels designed to protect human health. Lab analyses are also conducted for routine ambient monitoring to establish trends and for investigations designed to answer specific questions.

Analyses of environmental samples within Ecology are performed or contracted by Ecology's environmental laboratory at Manchester. Improvements in sample tracking, management systems, turnaround time, information flow, and training of lab users and personnel have occurred at Manchester laboratory. Continuing work is needed to adequately service the growing analytical needs of the programs the laboratory supports. For example, Ecology programs need to improve their ability to predict sample volumes in order to allow accurate estimations of staffing needs at the laboratory. Samples above the capacity of Manchester laboratory are sent to outside private (or sometimes public) laboratories for analysis.

Standardized protocols (procedures) for the collection and analysis of many types of environmental samples within Puget Sound exist, but their use is not uniform. The Puget Sound Estuary Program Protocols and Guidelines (Puget Sound Protocols and Guidelines) were developed to standardize sample collection and analysis within the Sound, allowing for comparability of data and determination of long-term environmental trends. The Puget Sound Protocols and Guidelines are being used with increasing consistency by many agencies and other organizations in the Puget Sound basin. There continues to be a lack of widespread awareness of the Protocols and Guidelines and their uses, however, resulting in the production of data that are not comparable.

Standardized, clearly-defined quality assurance and quality control procedures are lacking for many types of analyses. When they exist, there is no method to determine the extent to which they are followed, or whether quality assurance and quality control procedures are uniformly applied across different programs and among different agencies. Thus, lab results may come into question, and their usefulness can be impaired.

PROGRAM STATUS

The Washington State Legislature passed a law in 1987 (RCW 43.21A.230) that authorizes Ecology to establish a laboratory certification program (L-1). Ecology completed the plan for the laboratory certification (accreditation)¹ program by August 1988, a rule was adopted by April 1989, and the first application for lab accreditation was received in August 1989. Rules to require dischargers to use accredited labs were initially proposed for adoption in April 1989. Revised versions of these rules were adopted in October 1990. These revised rules established a special status known as "registration" for certain labs associated with dischargers. Registered labs participate in a program to prepare for accreditation. By November 1990 Ecology had accredited 29 laboratories, including Manchester.

Ecology completed the first laboratory plan (L-2) in March 1989, and has chosen to update the plan annually rather than biennially. The laboratory plan recommended 11 new staff members (full-time equivalents, or FTEs) and \$454,000 in new equipment to meet fiscal year 1990 needs. The plan also recommended a thorough study of the advantages and disadvantages of contracting out all laboratory work instead of operating the current laboratory at Manchester. Concurrently with developing the plan, Ecology has been implementing changes to improve services and data quality. Ecology has implemented a new cost-allocation system which allows the laboratory to operate more efficiently, and results in more accurate and reliable tracking of costs. This system is funded by user fees that reflect real cost, and has been approved by the Office of Financial Management and the U.S. Department of Interior. Ecology also has the ability to perform same-day contracting of samples above the capacity of Manchester laboratory.

Ecology established a Quality Assurance Section in March 1988 in Manchester, separate from the Manchester Laboratory facility. The section is staffed by six FTEs and is responsible for the tasks outlined in elements L-1 and L-4.

PROGRAM GOAL

To assure the quality and timeliness of physical, chemical, and biological laboratory tests necessary to support the protection and enhancement of the waters of Puget Sound.

PROGRAM STRATEGY

The strategy for achieving this goal is to (1) establish a laboratory certification program administered by Ecology that will review the capability of environmental laboratories to generate data of known quality; (2) assure that adequate laboratory support exists for agency and other sampling programs; (3) develop and update protocols and guidelines to standardize data collection, analysis, and transfer within Puget Sound, and to encourage their use uniformly for all data collected in Puget Sound; and (4) develop and encourage the use of uniform quality assurance guidelines for data collected under all Puget Sound programs.

¹ Ecology uses the term "accreditation" to have the same meaning as "certification" as used in RCW 43.21A.230 and this plan.

PROGRAM ELEMENTS

L-1. Laboratory Certification Program

[Completed portions of this element have been deleted.]

Ecology shall continue to implement a laboratory certification program. Under the program, Ecology shall certify all labs performing environmental analyses for substances and chemical groups and media in a phased manner, with first priority given to certifications that support water quality programs. During the design and implementation of the certification program Ecology shall work with federal and state agencies and local and tribal governments. Ecology shall also consult with individuals from the scientific community, private labs, environmental groups, and industry. Laboratories owned and operated by individual industrial and/or municipal dischargers shall be certified unless exempted by the enabling legislation. Agency-operated laboratories shall also apply for certification under the same rules that apply to private laboratories. The certification program shall be coordinated to the maximum extent possible with existing laboratory certification programs. Ecology shall negotiate agreements with other state certification programs meeting the standards of the Washington program to allow for reciprocity.

As a part of the certification program Ecology shall adopt rules requiring all certified laboratories to use approved field and laboratory protocols and to comply with specified quality assurance/quality control procedures. Ecology shall inform all certified labs that the use of adopted Puget Sound Protocols and Guidelines (L-3) is required for many Puget Sound plan programs. Ecology shall implement the Protocols and Guidelines in the Ecology laboratory at Manchester.

Lab users shall not be required to use certified labs until the certification program is operational and an adequate number of certified labs are available to perform needed analyses. (See also element P-16.)

Target Dates: Ecology to continue its ongoing efforts to carry out the lab accreditation program.

[Status: This element directed the Authority to propose legislation to authorize Ecology to design and implement a lab certification program (including certification fees). The required legislation was submitted and passed in 1987, see RCW 43.21A.230. Ecology adopted a rule (Ch. 173-50 WAC) governing the lab accreditation program in April 1989. Implementation of the laboratory accreditation program began in mid-1989. By November 1990 Ecology had accredited 29 laboratories, including Manchester. Amendments to discharge permit program rules to require use of accredited or registered labs were adopted in October 1990 (see element P-16).]

L-2. Laboratory Capacity

Ecology shall prepare a biennial laboratory plan that addresses the short- and long-term needs, capacity, and data management of Ecology and other state agencies and local and tribal governments, and make recommendations regard-

ing means to rectify shortfalls in the ability of the labs to support agency programs. The plan shall: identify target turnaround times² and specify acceptable holding times for analyses; assess available means to assure that all samples are analyzed within those times while meeting the highest possible quality standards; describe sample tracking and data management systems; include a consideration of the need for additional staff, including night shifts, to fully utilize existing agency lab equipment and facilities; and fully explore the use of lab capacity possessed by other agencies and the use of contract labs before recommending establishment of new lab facilities.

Ecology shall biennially submit to the Authority and the legislature an updated laboratory plan that includes (1) a revised estimate of the number and types of analyses needed to support Ecology programs; (2) a review of the service provided by Ecology laboratories including holding and sample turnaround times, data quality, and data management during the preceding two years; and (3) an updated analysis of the additional laboratory capacity needed to carry out these analyses within the target turnaround times which Ecology shall specify.

In preparing the laboratory plan, Ecology shall consult with the State Laboratory Coordinating Council and other state agencies, including the Departments of Health, Agriculture, and Labor and Industries, and tribal and local governments to incorporate their laboratory needs and capabilities related to the Puget Sound plan in the reports.

Target Dates: Ecology submits the laboratory plan to the Authority by November 1, 1988, and biennial updates every two years thereafter.

[Status: Ecology completed the first analytical needs assessment and laboratory plan in March 1989. Ecology has improved sample tracking and has implemented a cost allocation system. Delegation of specific purchase authority to Manchester laboratory by the Office of State Procurement in 1989 enabled same-day contracting of samples. This effectively extended the capacity of Manchester laboratory to include all accredited contract laboratories. By September 1990 the lab was producing accurate and precise results within their prescribed holding times, for a wide range of environmental parameters.]

L-3. Puget Sound Protocols and Guidelines

The Authority, in consultation with EPA and Ecology, shall develop and implement a process for the review and adoption of Puget Sound Estuary Program Protocols and Guidelines (L-1). The process shall provide for development of new protocols and guidelines, for review and revision of existing protocols and guidelines, and for formal adoption of the protocols and guidelines.

The development and review of the protocols and guidelines shall involve technical experts in fields relevant to the individual protocols and guidelines. The technical experts shall prepare recommendations which shall undergo extensive peer review. Consideration shall be given to involving experts from federal, and state agencies, local and tribal governments, the private sector, the academic community, and the public. The Authority shall recommend the Puget Sound Protocols and Guidelines to the Puget Sound Estuary Program Management Committee for adoption.

² Turnaround time is the time between submittal of sample to laboratory and receipt of results (after quality assurance) by the requester.

New protocols and guidelines shall be developed and existing protocols and guidelines revised as needed and reviewed biennially.

Target Dates: The PSEP Management Committee adopts Puget Sound Protocols and Guidelines beginning January 1991, and reviews them on a biennial basis thereafter.

[Status: The process for the development, review, and adoption of the Puget Sound Protocols and Guidelines was designed by Authority staff, in consultation with EPA and Ecology, during spring 1990. The 10 existing protocols and guidelines are: (1) General QA/QC considerations; (2) Conventional sediment variables; (3) Laboratory bioassays; (4) Station positioning; (5) Metals in Puget Sound water, sediment, and tissue samples; (6) Microbiological studies; (7) Organic compounds in Puget Sound sediments and tissue samples; (8) Subtidal benthic macroinvertebrate assemblages; (9) Fish pathology studies; and (10) Conventional water quality variables and metals. Authority, EPA, and Ecology staff are conducting outreach activities with local and tribal government and other organizations to increase the awareness and use of the protocols and guidelines. EPA, Ecology, and the Authority share responsibility for funding and managing the protocols and guidelines. The Authority staff made its initial recommendations to the Management Committee for adoption of the Puget Sound Protocols and Guidelines in the spring of 1990, and also have completed design of the development, review, and adoption process.]

L-4. Ecology Quality Assurance/Quality Control

4.1. Quality Assurance Management Plan

Ecology shall prepare a Quality Assurance Management Plan that addresses quality assurance and quality control (QA/QC) issues related to the collection of environmental data in support of Ecology programs and projects. The plan shall require that uniform quality assurance practices be incorporated into all Ecology data development activities. The plan should include requirements for (1) QA project plans; (2) training in, and technical assistance with, QA/QC principles and practices; and (3) QA audits of selected projects. Ecology QA project plans shall require the use of Puget Sound Protocols and Guidelines and of data qualifiers and data transfer formats specified in element M-4 where appropriate.

The QA/QC program shall include the following:

- Establishment of guidelines for the preparation of quality assurance project plans as required by the state/EPA agreement. The guidelines shall include establishment of specific objectives and development of sampling and analysis plans commensurate with objectives for major surveys.
- Audits of data quality (based on selected QA project plans), including checks that sampling and analytical procedures have been correctly performed, and reviews of data to verify that they meet user requirements including data quality objectives.
- A training plan for Ecology staff, including training needed to determine the appropriate number and type of samples and analyses for areas of investigation commonly encountered. Training needs will build upon informa-

tion gained during the planning process and during implementation and oversight of the resulting program.

- QA/QC assistance to the Ecology staff, including guidelines for use by regional office and Industrial Section staff in reviewing discharge monitoring report (DMR) data, guidelines for use by regional and Environmental Investigations staff in their evaluation of environmental laboratories, and technical guidance to Ecology staff concerning QA/QC in general.
- Other appropriate measures resulting from issues identified during the planning process.

4.2. QA/QC Working Group

The Authority shall convene a QA/QC working group to include Ecology, Health, EPA, DNR, and other agencies, tribal governments, and/or universities as appropriate to oversee the development of QA/QC standards for data collected under Puget Sound plan programs. The working group shall consist of QA/QC professionals, chemists, toxicologists, and managers from the appropriate agencies, a representative of the PSAMP Steering Committee, contract laboratory representatives, and other plan program staff as needed. For data routinely collected in Puget Sound, the working group shall: determine the level of QA/QC needed to meet data quality objectives appropriate for human health risk assessment and environmental trend analysis; determine training needs to allow program staff to handle routine QA/QC checks; design and implement training programs to meet those training needs; and determine the amount of professional QA/QC personnel time needed to complete QA/QC reviews. The working group shall report to the Authority on updated QA/QC needs annually.

Target Dates: 4.1: Ecology submits its QA/QC plan to the Authority by April 1, 1989. Ecology completes guidelines for quality assurance project plans for programs requiring analytical services by January 1, 1991. Ecology prepares QA project plans as needed starting July 1, 1990, and performs audits of selected projects for the purpose of identifying QA/QC deficiencies and corrective measures by July 1, 1990. Ecology provides annual reports on the implementation of the QA Management Plan to the Authority beginning July 1, 1991.

4.2: The QA/QC working group forms by September 1990 and reports on QA/QC to meet data quality objectives, training needs, and the amount of professional QA/QC help needed by January 1991. The working group shall design and begin implementation of QA/QC training programs by July 1991, and shall report annually to the Authority on updated QA/QC needs beginning in January 1992.

[Status: Ecology has created a Quality Assurance Section. Ecology developed a draft revision of its QA Management Plan in September 1989. A draft guidance document for the preparation of Ecology QA project plans was completed November 1989. Ecology QA training and technical assistance activities are ongoing and some QA project plans are being prepared.]

MAJOR PUBLIC ACTIONS FOR AUTHORITY REVIEW

1. Ecology's laboratory certification program (L-1).
2. Ecology's biennial laboratory plan (L-2).
3. Ecology's QA/QC plan (L-4).

**LEGISLATION
REQUIRED**

[Status: The required legislation was approved in 1987.]

ESTIMATED COST

This program is estimated to cost approximately \$0.8 to \$0.9 million per year. An increasingly large proportion of the costs are supported by lab certification fees.

Costs presented for element L-1 of this program are for the water quality component of the certification program and do not include costs for other areas (such as hazardous waste) for which Ecology may eventually certify laboratories. Costs for laboratory analyses needed by other programs in the Puget Sound plan are found in the cost estimates for those programs. Certification fees are expected to fund nearly all of the certification element.

The laboratory certification program may entail private sector costs (beyond the certification fees) to those NPDES permit holders not participating in an EPA-approved quality assurance program, to private laboratories, and to others who utilize private laboratories. These costs will vary depending upon several factors, including the current quality of the equipment and staff of the lab applying for certification and the protocols called for in the certification program Ecology designs.

If the laboratory plan (L-2) recommends new lab facilities for agencies, considerable additional costs could be incurred. The magnitude of those costs would depend on the location and size of the new lab. Any such costs would only be incurred after approval by the legislature.

Responsibilities for quality assurance and quality control within the Department of Ecology have been transferred from element L-2 to element L-4. Appropriate financial resources have also been transferred.

A goal of elements L-3 and L-4 is to achieve greater efficiencies in Ecology and other agencies. These efficiencies should result in cost savings in the long term.

1991 PUGET SOUND PLAN COST ESTIMATES¹

Laboratory Support

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
L-1 Laboratory Certification Program	\$0	\$577,946	\$1,094,102	\$1,281,557	\$1,273,288
L-2 Laboratory Capacity	\$78,584	\$141,694	\$283,822	\$283,822	\$283,822
L-3 Puget Sound Protocols and Guidelines	\$0	\$134,876	\$147,382	\$147,382	\$147,382
L-4 Quality Assurance/Qual. Control Prog	\$0	\$174,168	\$392,901	\$368,206	\$368,206
TOTALS	\$78,584	\$1,028,684	\$1,918,207	\$2,080,967	\$2,072,698

BY IMPLEMENTING AGENCY

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Department of Agriculture	\$17,488	\$0	\$6,500	\$6,500	\$6,500
Department of Health	\$35,548	\$0	\$60,254	\$60,254	\$60,254
Department of Ecology	\$0	\$893,808	\$1,649,042	\$1,818,123	\$1,809,854
EPA Region 10	\$0	\$30,000	\$109,362	\$109,362	\$109,362
Department of Labor and Industry	\$0	\$0	\$6,500	\$6,500	\$6,500
Local Governments	\$0	\$0	\$6,500	\$6,500	\$6,500
Puget Sound Water Quality Authority	\$0	\$80,000	\$63,219	\$56,898	\$56,898
Tribal Governments	\$0	\$24,876	\$6,500	\$6,500	\$6,500
Department of Fisheries	\$25,548	\$0	\$4,948	\$4,948	\$4,948
Department of Wildlife	\$0	\$0	\$5,382	\$5,382	\$5,382
TOTALS	\$78,584	\$1,028,684	\$1,918,207	\$2,080,967	\$2,072,698

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Federal Funding Sources	\$0	\$30,000	\$136,750	\$136,750	\$136,750
Lab Certification Fees	\$0	\$106,496	\$829,476	\$1,281,557	\$1,273,288
Local Funding Sources	\$0	\$0	\$6,500	\$6,500	\$6,500
State General Fund	\$78,584	\$892,188	\$938,981	\$649,660	\$649,660
Tribal Funding Sources	\$0	\$0	\$6,500	\$6,500	\$6,500
TOTALS	\$78,584	\$1,028,684	\$1,918,207	\$2,080,967	\$2,072,698

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

PLAN COSTS

PROGRAM ELEMENT DIRECTORY

C-1. Study of Long-Term Funding Options 288



The Puget Sound Water Quality Management Plan imposes costs on federal and state agencies, local and tribal governments, the private sector, and individuals. Potential revenue sources to meet public sector costs include state and local general funds, the Centennial Clean Water Fund (cigarette tax), the state revolving fund for low- or no-interest loans for clean water projects, state wastewater discharge permit fees, the state superfund (toxics control accounts), a variety of fees, federal clean water funds, and the National Estuary Program. Financing decisions by the U.S. Congress, the governor, the legislature, the Authority, and local jurisdictions will affect the implementation of the plan.

Revenue constraints have delayed and continue to threaten timely plan implementation. After action by the 1987 legislature on the plan's budget, the Authority delayed and scaled back activities in many of the plan's programs because of the funding shortfall. In an effort to propose a budget that would not be severely cut for the 1989-1991 biennium, the Authority scaled back the plan to about two-thirds of the funding needed for full implementation. This was again accomplished by both delaying and cutting back activities in nearly every program. But actual funding for the plan was even further reduced.

Recognizing that stable, long-term funding is crucial for success in protecting the Sound, a study of long-term funding options (element C-1) in the 1989 Puget Sound Water Quality Plan was undertaken and partially completed during the current biennium. The study identified new and existing potential funding sources to support the long-term implementation of the Puget Sound plan. The Puget Sound Finance Committee, established under element C-1, made several recommendations for enhanced funding. In this final plan, the Estuary Management and Plan Implementation Program element EM-5 has replaced element C-1. Under EM-5 the Authority shall continue to identify and propose new sources of long-term funding for plan implementation.

Public agency costs for implementing the final 1991 plan have been estimated. Tables A and B summarize the federal, state, tribal, and local costs of each program for each two-year fiscal period through the 1995 biennium. Programs in the plan continue past 1997, but costs have not been estimated past that date. Estimated public sector costs from fiscal year 1992 through fiscal year 1997 average about \$54.2 million per year. Annual costs rise from about \$12 million in fiscal year 1988 to an estimated \$59 million in fiscal year 1997. More detailed information summarizing the estimated costs of each program is included with each program description.

These estimated costs represent the best judgment of the Authority in assessing the public agency work involved in plan implementation. The Authority has consulted extensively with federal and state agencies and local and tribal governments to develop these estimates.

The 1989-91 biennium costs for state agencies used in the tables throughout this plan are based on state agency spending reports. Federal agency and tribal and local government costs for the 1989-91 biennium are estimates from the 1989 Puget Sound Water Quality Management Plan, and do not reflect actual expenses.

ditures for that biennium. It is estimated that only \$37.8 million of the \$54 million identified in the 1989 plan actually became available.

Federal Agencies

The Authority believes that the Puget Sound effort should be more significantly assisted by federal appropriations. The U.S. Environmental Protection Agency has been instrumental in funding research and plan development through the Puget Sound Estuary Program. EPA provided funds for the development of the plan as a federal comprehensive conservation and management plan (CCMP) under the National Estuary Program. The 1991 plan will serve as both a federal and state document. With the adoption of the CCMP, most of the EPA funding under Section 320 of the Clean Water Act (CWA) will no longer be available. EPA funding will still be obtainable for nonpoint source pollution under Section 319 of the CWA. The Washington State Congressional delegation is also seeking a line item appropriation for increased funding for the Puget Sound Estuary Program. Over the next 10 years up to \$100 million may be provided if these efforts are successful.

Several other federal agencies are making significant contributions to the Puget Sound effort. For example, the U.S. Army Corps of Engineers has played a major role in developing a dredging management program for the Sound and is currently engaged in its implementation. The National Oceanic and Atmospheric Administration maintains an ongoing research program addressing a wide range of Puget Sound issues. The U.S. Fish and Wildlife Service has instituted a Puget Sound Initiative. Approximately \$200,000 has been budgeted for this program. The Soil Conservation Service (U.S. Department of Agriculture) is continuing to provide essential support to local nonpoint programs through its Puget Sound Cooperative River Basin Team. The U.S. Geologic Survey is assisting in development of the Puget Sound geographic information system. Several of the military installations around Puget Sound have expressed an interest in more direct participation in many plan activities.

State Agency Costs

State agency responsibilities under the plan are primarily funded by appropriations from the state general fund, although there are some revenues from fees, special accounts, and capital expenditures. Expenditures from the general fund will be \$14 million in the 1989-91 biennium. The general fund appropriation is a significant reduction from the final 1989 plan request of \$27 million. General fund requests in the 1991 plan have been held down to about \$30 million for ongoing programs. New initiatives, such as habitat protection, and some program enhancements will require additional support, driving the general fund request up to \$37.4 million.

In October 1987 the state legislature passed legislation popularly known as the state superfund. This legislation was superseded by Initiative 97, which required increases in waste discharge permit fees and established the toxics control accounts. One result is that general fund money previously allocated to Ecology's waste discharge permit program has become available for implementation of the Puget Sound plan.

The anticipated discharge fee revenue for the current biennium is nearly \$7 million statewide, of which \$2.67 million is devoted to plan activities at the Department of Ecology. Expected revenues for the ensuing biennium will be significantly greater as Ecology moves to recover all eligible program costs in accordance with Initiative 97 mandates. Revenue available from the permit fee ac-

count for the plan's Municipal and Industrial Discharges Program will more than double.

In addition to the general fund and waste discharge fees, state agencies may use funds from the federal Coastal Zone Management Act, the Puget Sound Estuary Program (EPA funds), the USGS, and the federal Clean Water Act to implement some plan elements. Improvements by the state Department of Transportation to highway drainage systems are expected to be paid for by federal interstate funds, state gasoline tax, and other highway revenue sources. Element EM-5, Implementation of Long-term Funding Proposals, addresses the issue of additional sources of funding.

Local Government Costs

Ecology began disbursing funds from the Centennial Clean Water Fund (cigarette tax) to local governments in fiscal year 1989. Local government activities required under the plan are expected to receive between \$4 million and \$6 million annually through grants from the Department of Ecology. Some of the federal clean water funds may also be made available to augment this account. Other sources of local funds may include sewer and storm drainage utility revenue, fees for inspections of on-site septic systems, state superfund monies, the National Estuary Program, federal Farmers Home Administration grants, and local general fund sources. Some elements of the plan will require substantial funding at the local level. While the Centennial Clean Water Fund will provide some funding, local governments may find it necessary to pay for the increasing costs for some of these activities with new long-term revenue sources. For example, funding to cover the cost of stormwater activities is expected to come from drainage utility revenues and the Public Works Trust Fund. These long-term funding issues resulting from the plan were addressed by work done under 1989 plan element C-1, Study of Long-Term Funding Options. One of the funding source recommendations is included as new element EM-6, Puget Sound Grants Program. Element EM-6 would follow the PIE-Fund concept in providing additional financial support to local governments for plan implementation.

Private Sector Costs

Many program elements will result in pollution control actions by private parties. The private sector, including individuals, may incur added costs as plan elements are implemented (for example, the private costs of upgrading septic systems). These expenses are broadly identified, where possible, in the text of each program area. It is not possible to determine private costs more precisely until public agencies adopt regulations called for in the plan and the nonregulatory programs are developed and implemented.

Private entities may participate in the financing of certain plan elements. For example, The Nature Conservancy and the Trust for Public Lands regularly assist in the acquisition of Puget Sound wetlands. Private consulting firms and research institutions helped finance the First Annual Meeting on Puget Sound Research. Corporations and other private entities have participated extensively in funding and carrying out public involvement and education activities. This kind of support is expected to continue and grow.

SUMMARY

Fully implementing the 1991 plan will cost federal and state agencies and tribal and local governments approximately \$98 million during the period from July 1991 through June 1993. The Authority is concerned that there will continue to be unmet funding needs, especially over the long term. The Authority is pursu-

ing the adoption of a variety of revenue generating measures including those recommended by the Puget Sound Finance Committee pursuant to element C-1, Study of Long-Term Funding Options; the Department of Ecology's funding assessment for shellfish under SF-6; the use of released state general funds due to increased NPDES permit fees for plan programs; the use of the state toxic accounts; and other federal, state, and local funding sources. Elements EM-5, EM-6, and EM-7 all address funding.

PROGRAM ELEMENT

C-1. Study of Long-Term Funding Options

[Completed portions of this element have been deleted. The remaining task, implementation, has been moved to element EM-5.]

[Status: The Authority established the Puget Sound Finance Committee to identify new and existing potential sources of funding to support the long-term implementation of the Puget Sound plan. This study was conducted in consultation with the Association of Washington Cities, the Washington State Association of Counties, tribal governments, the members and staffs of the legislative Ways and Means Committees, other legislators, the Governor's Office, citizens' groups, business associations, other relevant public and private entities, and state agencies.

The committee in its deliberations focused on the year 1994, when the projected shortfall would reach \$38.9 million per year, computed by extrapolating 1989 spending at the state and local levels. The committee studied over 20 possible funding sources, including a variety of state taxes, the establishment of a regional fee, rate revenues, a private foundation, and increased reliance on the state general fund.

These sources were combined into a set of six alternatives. Each alternative was designed to make up the identified \$38.9 million annual shortfall. The committee issued a draft report and held a series of public meetings throughout the Puget Sound region, and received many thoughtful comments. In general, the respondents:

- Understood the need for and supported obtaining additional revenue to carry out the Puget Sound plan;
- Were nearly universally supportive of the private foundation concept;
- Were generally, but not universally, in favor of the proposed state tax enhancements;
- Supported user rates, and the distribution of costs between polluters and direct beneficiaries;
- Were most divided in their support for a regional fee, which would fund regional activities.

The committee recommended a financing package that included new local sources of \$18.5 million, new state sources of \$8.6 million, increased use of the state general fund by \$9.3 million, and revenue raised by a private foundation of \$2.5 million. The Authority's actual financing proposal for 1991 is described in element EM-5.]

1991 PUGET SOUND PLAN COST ESTIMATES

Puget Sound Water Quality Authority Activities

BY PROGRAM

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Authority Activities	\$2,176,058	\$2,905,934	\$2,709,440	\$2,728,405	\$2,787,444
Estuary Management & Plan Implementation	\$2,282	\$28,251	\$411,836	\$584,082	\$584,082
Education and Public Involvement	\$1,370,700	\$1,200,000	\$1,113,000	\$1,213,610	\$1,243,610
Habitat Protection	\$0	\$15,000	\$44,254	\$37,932	\$37,932
Laboratory Support	\$0	\$80,000	\$63,219	\$56,898	\$56,898
Municipal and Industrial Discharges	\$28,852	\$65,598	\$251,150	\$263,794	\$263,794
Monitoring	\$208,667	\$566,626	\$769,894	\$838,580	\$758,580
Nonpoint Source Pollution	\$172,689	\$101,346	\$127,437	\$93,436	\$82,184
Research	\$179,287	\$0	\$170,114	\$37,930	\$37,930
Contaminated Sediments and Dredging	\$42,768	\$74,080	\$18,966	\$6,322	\$0
Shellfish Protection	\$10,998	\$63,448	\$1,795,020	\$1,795,020	\$1,769,732
Spill Prevention and Response	\$0	\$154,012	\$327,660	\$71,372	\$71,372
Stormwater and CSOs	\$25,512	\$119,654	\$63,217	\$37,930	\$37,930
Wetlands Protection	\$25,048	\$29,224	\$158,046	\$158,046	\$158,046
PLAN TOTALS	\$4,242,861	\$5,403,173	\$8,023,253	\$7,923,357	\$7,889,534

1991 PUGET SOUND PLAN COST ESTIMATES

Puget Sound Water Quality Authority Activities

BY FUNDING SOURCE

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$2,051,720	\$2,243,966	\$2,253,966
Centennial Clean Water Account	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000	\$1,100,000
Federal Funding Sources	\$267,365	\$474,584	\$170,114	\$37,930	\$37,930
State General Fund	\$2,875,496	\$3,828,589	\$4,701,419	\$4,541,461	\$4,497,638
TOTALS	\$4,242,861	\$5,403,173	\$8,023,253	\$7,923,357	\$7,889,534

TABLE A: 1991 PUGET SOUND PLAN COST ESTIMATES¹
BY PROGRAM

	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Authority Activities	\$2,176,058	\$2,905,934	\$2,709,440	\$2,728,405	\$2,787,444
Estuary Management & Plan Implementation	\$965,011	\$694,917	\$3,813,346	\$3,967,218	\$3,824,134
Education and Public Involvement	\$1,985,380	\$1,410,168	\$5,202,792	\$7,456,523	\$8,826,262
Puget Sound Foundation	\$0	\$0	\$408,154	\$377,154	\$369,154
Habitat Protection	\$0	\$15,000	\$4,134,234	\$3,549,524	\$3,649,524
Household Hazardous Waste	\$32,000	\$203,184	\$492,752	\$488,158	\$403,738
Laboratory Support	\$78,584	\$1,028,684	\$1,918,207	\$2,080,967	\$2,072,698
Municipal and Industrial Discharges	\$2,056,909	\$4,768,840	\$12,173,563	\$14,205,626	\$18,134,782
Monitoring	\$776,245	\$2,477,222 ²	\$7,556,493	\$7,189,073	\$7,009,074
Nonpoint Source Pollution	\$11,560,023	\$11,568,552	\$12,163,892	\$13,291,302	\$13,150,942
Research	\$179,287	\$96,000	\$296,550	\$340,804	\$309,194
Contaminated Sediments and Dredging	\$1,435,776	\$2,144,114	\$4,560,667	\$4,089,387	\$4,212,294
Shellfish Protection	\$1,507,142	\$3,160,078	\$7,249,226	\$7,216,264	\$7,190,976
Spill Prevention and Response	\$124,713	\$301,296	\$2,332,144	\$1,034,198	\$856,492
Stormwater and CSOs	\$698,038	\$3,465,948	\$7,000,856	\$15,177,616	\$21,827,107
Wetlands Protection	\$1,057,733	\$3,609,816 ³	\$25,988,163	\$24,814,956	\$24,855,027
PLAN TOTALS	\$24,632,899	\$37,849,753	\$98,000,479	\$108,007,175	\$119,478,842
BY FUNDING SOURCE					
	<u>87-89 Bien</u>	<u>89-91 Bien</u>	<u>91-93 Bien</u>	<u>93-95 Bien</u>	<u>95-97 Bien</u>
Puget Sound Grants Program (EM-6)	\$0	\$0	\$4,856,158	\$4,818,608	\$5,058,608
Aquatic Lands Enhancement Account	\$0	\$1,525,000 ⁴	\$0	\$0	\$0
State Capital Funds	\$1,049,000	\$414,982	\$21,811,376	\$22,411,376	\$22,411,376
Centennial Clean Water Account	\$8,516,737	\$10,469,784	\$10,469,500	\$9,869,500	\$9,869,500
Federal Funding Sources	\$327,565	\$1,916,342	\$1,670,340	\$1,306,178	\$1,306,178
Lab Certification Fees	\$0	\$106,496	\$829,476	\$1,281,557	\$1,273,288
Local Funding Sources	\$3,542,461	\$6,276,304	\$7,314,690	\$12,124,900	\$18,515,032
Motor Vehicle Fund	\$0	\$110,750	\$976,752	\$1,223,232	\$1,223,232
Permit Fee	\$1,618,000	\$2,674,340	\$9,038,353	\$10,935,450	\$13,004,761
Private Funding Sources	\$0	\$0	\$134,236	\$567,828	\$528,218
State General Fund	\$9,505,752	\$14,141,625	\$37,452,893	\$39,230,165	\$41,772,789
Toxics Accounts	\$0	\$140,000	\$2,954,005	\$3,771,681	\$4,049,160
Tribal Funding Sources	\$73,384	\$74,130	\$492,700	\$466,700	\$466,700
TOTALS	\$24,632,899	\$37,849,753	\$98,000,479	\$108,007,175	\$119,478,842

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government costs are based on 1989 plan estimates.

² Includes \$490,000 used by Ecology for monitoring fresh water and the marine water column. Ecology does not count this as part of its plan implementation budget.

³ Includes \$1,525,000 as a one-time revenue source from the Aquatic Lands Enhancement Account made possible by DNR.

⁴ These funds were made available by the Department of Natural Resources as a one-time revenue source for wetlands acquisition and inventory. This will not be repeated in future biennia.

TABLE B: 1991 PUGET SOUND PLAN COST ESTIMATES¹
BY IMPLEMENTING AGENCY

	87-89 Bien	89-91 Bien	91-93 Bien	93-95 Bien	95-97 Bien
Department of Agriculture	\$68,284	\$100,000	\$334,100	\$366,600	\$334,100
Attorney General	\$0	\$0	\$0	\$21,000	\$0
Bureau of Land Management	\$0	\$0	\$13,000	\$13,000	\$13,000
Conservation Commission	\$723,186	\$35,800	\$175,500	\$175,500	\$195,000
Conservation Districts	\$0	\$538,400	\$1,520,000	\$1,520,000	\$1,520,000
Cooperative Extension	\$0	\$100,000	\$1,652,784	\$2,077,604	\$2,652,025
U.S. Army Corps of Engineers	\$0	\$0	\$70,472	\$58,726	\$58,726
Department of Community Development	\$0	\$0	\$380,719	\$374,653	\$363,024
Department of Natural Resources	\$751,879	\$1,569,000 ²	\$23,757,235	\$23,306,779	\$23,297,482
Department of Health	\$1,212,786	\$2,154,000	\$5,091,110	\$4,870,651	\$4,941,861
Department of Revenue	\$0	\$0	\$0	\$0	\$0
WA Department of Transportation	\$0	\$110,750	\$2,505,728	\$3,502,208	\$3,502,208
Department of Ecology	\$6,175,927	\$11,249,788 ³	\$27,278,604	\$30,785,034	\$34,775,114
EPA Region 10	\$60,200	\$230,052	\$1,154,418	\$989,736	\$989,736
Puget Sound Foundation	\$0	\$96,000	\$534,590	\$680,028	\$640,418
U.S. Soil Conservation Service	\$0	\$0	\$15,600	\$15,600	\$15,600
Department of Labor and Industry	\$0	\$0	\$9,750	\$6,500	\$32,500
Local Governments	\$9,983,218	\$14,974,688	\$16,089,190	\$20,304,400	\$26,794,532
National Marine Fisheries Service	\$0	\$0	\$13,000	\$13,000	\$13,000
National Oceanic and Atmospheric Admin.	\$0	\$0	\$35,750	\$19,500	\$19,500
Office of Financial Management	\$0	\$0	\$0	\$0	\$0
Parks and Recreation Commission	\$963,543	\$709,306	\$981,744	\$2,176,925	\$1,987,760
Pollution Control Hearings Board	\$17,000	\$0	\$0	\$0	\$0
Private Groups	\$0	\$0	\$7,800	\$7,800	\$7,800
Puget Sound Water Quality Authority	\$4,242,861	\$5,403,173	\$8,023,253	\$7,923,357	\$7,889,534
Washington Sea Grant	\$0	\$0	\$1,003,025	\$1,110,988	\$1,464,877
Superintendent of Public Instruction	\$0	\$0	\$306,200	\$480,400	\$492,400
Department of Trade and Econ. Develop.	\$0	\$0	\$32,500	\$65,000	\$97,500
Tribal Governments	\$273,384	\$309,006	\$1,893,700	\$2,002,700	\$2,132,700
U.S. Coast Guard	\$0	\$0	\$2,350	\$2,350	\$2,350
U.S. Forest Service	\$0	\$0	\$25,842	\$14,096	\$14,096
U.S. Fish and Wildlife Service	\$0	\$0	\$138,006	\$117,452	\$117,452
U.S. Navy	\$0	\$0	\$58,726	\$58,726	\$58,726
Washington Conservation Corps	\$0	\$0	\$90,000	\$90,000	\$90,000
Department of Fisheries	\$98,566	\$210,000	\$3,094,496	\$3,174,956	\$3,239,217
Department of Wildlife	\$62,065	\$59,790	\$1,708,687	\$1,679,306	\$1,724,004
Western Washington University	\$0	\$0	\$2,600	\$2,600	\$2,600
TOTALS	\$24,632,899	\$37,849,753	\$98,000,479	\$108,007,175	\$119,478,842

¹ 1987-89 costs are based largely on 1987 plan estimates. 1989-91 costs for state agencies are based on agency reports of actual spending. 1989-91 federal agency and tribal and local government are based on 1989 plan estimates.

² Includes \$1,525,000 from the ALEA funds made available by DNR as a one-time revenue option, not to be repeated in future biennia.

³ Includes \$490,000 used by Ecology for monitoring fresh water and marine water column. Ecology does not count this as part of its plan implementation budget.

Chapter 4.

The Unfinished Agenda



INTRODUCTION

The action plan contained in Chapter 3 of this document represents a comprehensive program to protect Puget Sound. The plan consists of 15 programs that address the major threats to the Sound. A number of other issues affecting the health of the Puget Sound environment were reviewed by the Authority as part of the initial scoping of the Puget Sound plan and during public review of the 1989 plan. With adoption of the 1989 plan, the Authority decided how to address each of the unfinished agenda issues from the draft 1989 plan. This chapter summarizes the unfinished agenda decisions made in prior plan cycles and proposes additional unfinished agenda items to be considered by the Authority during the 1991 plan process and into the future.

HISTORY OF THE UNFINISHED AGENDA

During the fall of 1985, the Authority conducted a public scoping process as part of its initial efforts to prepare a comprehensive list of Puget Sound environmental problems and possible causes. Many issues of concern were suggested for consideration. In December 1985 the Authority selected the issues to be addressed in the 1987 plan. A number of issues could not be dealt with during the 1987 plan process. Many of these were presented in Chapter 7 of the 1987 plan as the "unfinished agenda." During the 1989 plan process, the public was asked to comment on the importance of these issues as part of their review of the draft 1989 plan. Extensive public comment was received. Using this information, the Authority decided, in the final 1989 plan, how to address each of the unfinished agenda issues.

THE 1989 UNFINISHED AGENDA ISSUES, DECISIONS, AND CURRENT STATUS

The 1989 plan contained a fairly complete description of each of the unfinished agenda issues as well as a decision on actions the Authority should take on each issue. The magnitude of the planned actions ranged from large (preparation by the Authority of issue papers leading to eventual plan language) to very small (Authority to monitor other agency activities and comment when appropriate). Unfortunately, the budget request needed by the Authority to carry out all of the actions was not granted. As a result, only some of the tasks were undertaken. Authority staff prepared issue papers on Fish and Wildlife Habitat, Pesticides, and Spill Prevention. The Authority has managed a major study of the

deposition of airborne contaminants. The Authority, Department of Ecology, and the Environmental Protection Agency (EPA) have jointly worked with military facilities to develop environmental plans. Other unfinished agenda issues received little or no Authority staff attention.

In the following sections, each of the unfinished agenda issues of the 1989 plan is briefly described, and the proposed Authority actions and the current status are listed.

Fish and Wildlife Habitat

Fish and wildlife habitat consists of the combination of factors such as available food, water, cover, and open space that enables animals to survive in their environment. Without food and water, protection from predators, room to breed and raise young, and territory such as migratory corridors to meet their basic needs through the seasons, animals will not survive.

The statute creating the Puget Sound Water Quality Authority calls for the Puget Sound plan to include recommendations on "protecting, preserving and, where possible, restoring wetlands and wildlife habitat and shellfish beds throughout Puget Sound" (RCW 90.70.060 (11)). Since 1987 the Puget Sound plan has included a wetlands protection program and a shellfish protection and restoration program, both of which are currently being implemented. However, prior to the 1991 plan there was no comparable program for the protection and restoration of non-wetland terrestrial or deep/open water habitats.

The 1989 plan directed Authority staff to conduct additional scoping of the fish and wildlife habitat issue and to report back to the Authority with a recommendation for the best way to address the issue. A workshop was held in December 1988 to discuss habitat protection problems and opportunities. In October 1989 a draft issue paper was released. Four public meetings were held during October 1989 to obtain public comment. The final issue paper was released in April 1990. A new program for habitat protection is included in this 1991 plan.

Hazardous Materials Spill Prevention and Response

Large quantities of petroleum and other hazardous substances are produced, stored, and used in the Puget Sound basin. There are thousands of shipments of these substances every year by barge and tanker on Puget Sound, and by air, tank, truck, rail car, and pipeline over and around the Sound. The 1989 plan directed the Authority to assess federal, state, and local spill prevention measures and to prepare a report by January 1990 recommending measures that would reduce the likelihood of spills affecting Puget Sound. The Authority formed a committee to advise it on prevention of spills of petroleum and other hazardous substances. A draft issue paper was released and four public meetings were held in October 1989 to obtain public comment. A final issue paper was released in April 1990. In the spring of 1989 the states of Alaska, Washington, and Oregon joined with the Province of British Columbia to form the States/B.C. Task Force on Oil Spills. Ecology represents Washington State on the task force. Authority staff work has been integrated into the task force effort. The recommendations of the issue paper and the task force are incorporated in the Spill Prevention and Response Program of the 1991 Puget Sound plan.

Pesticides

Pesticides are a large and varied group of substances that are specifically designed to kill biological organisms including weeds, insects, and rodents. Included in this diverse group are fungicides, herbicides, insecticides,

nematicides, rodenticides, fumigants, disinfectants, wood preservatives, and antifoulants.

The 1989 plan directed the Authority to:

- Convene an advisory committee on the pesticide issues facing Puget Sound;
- Prepare an issue paper addressing technical questions and reviewing the existing regulatory structure that controls the use and disposal of pesticides;
- Encourage Puget Sound Estuary Program funding of additional characterization studies to determine the distribution, ambient concentration, and potential effects of selected pesticides in Puget Sound water bodies, sediments, and biota; and
- Encourage educational efforts by the Cooperative Extension Service and others to promote the safe application, storage, and disposal of pesticides.

The Authority formed an advisory committee on the pesticides issue in 1989. EPA funded additional research on pesticides in Puget Sound. A draft issue paper was released in October 1989 and four public meetings were held to obtain public comment. A final issue paper was released in April 1990. Recommendations from the issue paper are incorporated as elements in several programs of the 1991 plan, including Monitoring, Household Hazardous Waste, Stormwater, and Education and Public Involvement.

Federal Facilities

The concerns arising from the normal activities on military bases and other federal facilities around Puget Sound are almost identical to those arising from the normal activities in homes, farms, and industry throughout the region. The 1989 plan directed the Authority, EPA, and Ecology to continue ongoing efforts to achieve plan compliance by Department of Defense facilities. Following on-site visits, compliance agreements were to be negotiated. The Authority would also work with EPA to prepare a federal consistency report to be integrated with the plan, and to assist the Puget Sound Estuary Program (PSEP) Management Committee in developing action recommendations related to federal activities for the 1991 plan.

During 1989 EPA, the Authority, and Ecology sent letters to the military bases in the Puget Sound basin identifying known and suspected environmental problems on the bases. The agencies are now in the process of negotiating compliance agreements. This process is described in the new federal activities elements, part of the new Estuary Management Program. The Estuary Management Program also includes elements to ensure that federal activities are consistent with the Puget Sound plan.

Effects of Air Pollution on Water Quality

Examples of sources of air pollution include industrial smokestacks, motor vehicle exhausts, woodstoves, aerial spraying of pesticides, evaporation from waste treatment plants, slash burning, landfill gases, incinerator emissions, and release of volatile substances from dry cleaners. Pollutants may enter Puget Sound waters through precipitation or direct fallout. Pollutants may also enter Puget Sound via surface water runoff that picks up air pollution contaminants that have been deposited on the ground.

Recent studies indicate that atmospheric deposition is a major pathway by which toxic pollutants, such as metals, pesticides, polycyclic aromatic hydrocar-

bons (PAHs), and polychlorinated biphenyls (PCBs) enter the upper Great Lakes. In some coastal areas (such as the southern California Bight) measurements show that up to half of the PAHs and particulate metals entering the water come from direct atmospheric deposition.

The 1989 plan directed the Authority to manage an EPA-funded study to evaluate atmospheric deposition of toxic contaminants to Puget Sound. The study of atmospheric pollutants was initiated in the spring of 1989. Personnel from the Puget Sound Air Pollution Control Agency and other air quality experts have assisted with this study. The study includes results and analysis of field measurements of atmospheric deposition of toxic substances, as well as an overview of the regulatory structure affecting this issue.

Preliminary results from the study indicate that the high concentrations of toxicants which have been measured in the sea-surface microlayer are most likely the result of airborne deposition. The final results of the study will be available in early 1991.

Aquaculture

Aquaculture in the state of Washington involves the controlled cultivation and harvest of aquatic animals and plants such as shellfish, finfish, and edible "sea vegetables" (marine algae). This industry utilizes a number of different production methods to produce a wide variety of species. Methods include tideland cultivation, off-bottom culture (for oysters), open water suspension, net-pen rearing, and pond or tank culture. Aquaculture production in Puget Sound in 1986 had a reported value of \$15.8 million.

There has been substantial public controversy over some aspects of the aquaculture industry, particularly over the floating culture of salmon, shellfish, and nori. Opposition to the siting of these aquaculture facilities has focused on potential conflicts with boating, fishing, and aesthetic values (such as residential views). Other concerns are related to the potential effects on water quality and bottom organisms. There have been some additional questions about the introduction of disease, antibiotics, and competition with natural fishery stocks.

Currently, new net pens and fish hatcheries are required to obtain a discharge permit from the Department of Ecology under the Clean Water Act. Existing operations will also have to obtain permits. These operations must comply with both federal and state technology standards. There are still some questions remaining as to what constitutes best available control technology. Before an aquatic lands lease can be obtained from the Department of Natural Resources (DNR) for a salmon net pen, the project must first demonstrate that it will comply with a set of interagency interim guidelines for management of salmon net pens. These are intended to help mitigate the potential biological effects of the pens by making sure that they are placed where depths and currents will help disperse the fish wastes. In order to develop more comprehensive recommendations for finfish net pen siting, PSEP provided funding for Ecology and DNR to form a task force to develop standards that will address the potential impacts of net pen operation—both biological and aesthetic—and define best management practices for them. As of December 1990 the project has not been successful in bringing together all of the opposing interest groups.

The 1989 plan stated that actions by the Authority would be limited to reviewing and commenting on significant actions related to this issue, including the programmatic EIS on salmon net-pen culture that was being prepared by WDF. The Authority has commented on the salmon net-pen culture EIS and sup-

ported the PSEP funding to develop a management plan for net-pen aquaculture.

Contamination of the Sea-Surface Microlayer

The sea-surface microlayer, located at the interface between the water and the air, is only about 0.002 inches (50 micrometers) thick. It is composed of a complex mixture of natural and (sometimes) synthetic substances which float on the surface of the water. The sea surface is a highly productive habitat, supporting an abundance of bacteria, microalgae, and planktonic animals that feed on these sources of food. At certain times in their development, the eggs and larvae of many marine animals (e.g., crabs, sole, flounder, cod, and hake) are buoyant and may be exposed to contaminants in the sea-surface microlayer.

Contaminants with low solubility in water and contaminants associated with floating particles can become concentrated at the sea surface. Concentrations of contaminants can be orders of magnitude greater in the microlayer than the concentrations of the same contaminants in the underlying water. Substances that have been found to concentrate in the microlayer in Puget Sound include both natural and anthropogenic PAHs, PCBs, pesticides, metals, oils, greases, inorganic nitrogen compounds, and bacteria. Sources of contamination to the sea-surface microlayer may include the atmosphere, petroleum or fuel spills, dredged material disposal, recreational and commercial boating activities, stormwater runoff and other nonpoint sources, and the water column (e.g., floatable oil and grease and organic matter from wastewater treatment plants or industrial outfalls).

The 1989 plan referred the issue of microlayer contamination to the Committee on Research in Puget Sound and called for a workshop on microlayer research to help determine the extent of the problem in Puget Sound. Microlayer contamination, as related to the effects of air pollution, would also be addressed in the study of atmospheric deposition of toxic contaminants in Puget Sound.

The Committee on Research, working through EPA, sponsored the microlayer workshop in 1989. The results of that workshop are being produced as a report which will guide further research. Possible interactions between the microlayer and atmospheric contaminants are being considered in the atmospheric deposition study. As research proceeds, future Authority actions to protect the microlayer may be recommended.

Freshwater Use and Availability

There are many competing interests for the use of fresh water. Some interests require that water remain in the streams or rivers. For example, fish production depends on adequate instream flows and habitat conditions. Hydroelectric power and some recreational activities (such as boating and fishing) also depend on adequate instream water supplies. Other activities require diversion of the water for out-of-stream uses. Industrial, commercial, residential, and agricultural users compete for the water that is withdrawn from the stream.

The 1989 plan indicated that Authority activities would be limited to reviewing and commenting on significant activities, such as the recommendations of the Joint Select Committee on Water Resource Policy and the Water Use Efficiency Study Committee. Staff and funding limitations have constrained Authority monitoring of this issue.

Groundwater Contamination

Contaminated groundwater can carry pollutants to the waters of Puget Sound. Groundwater basins can be hydrogeologically linked to both surface waters in the basin and to the Sound itself. Thus, pollutants in groundwater can affect water quality in the Sound. Contaminants can reach groundwater from a variety of sources including improper disposal of solid or hazardous wastes, failing on-site sewage disposal (septic) systems, spills and accidents, and other activities that allow potential contaminants to migrate underground.

Although relatively little is known about the extent of contamination of Puget Sound by groundwater, some cases have been documented. One of the best known examples is Commencement Bay where groundwater contaminated by historical industrial activity joins the many surface water discharges. Groundwater contamination was confirmed in at least two waterways in the Commencement Bay vicinity due to past waste disposal practices and leakage from underground storage tanks and pipelines. In one waterway groundwater was found to contribute 74 percent of the total loadings of trichloroethylene and tetrachloroethylene (or 5.9 pounds per day). These contaminants are from solvent plant wastes that were disposed on site from 1947 to 1973.

Groundwater carrying contaminants to Puget Sound has also been confirmed in Eagle Harbor and Budd Inlet. Both sites involve wood preserving operations where creosote and other organic compounds have built up in the ground over time and are now visibly seeping into Puget Sound. The direct link between contamination of surface water and groundwater is illustrated in the Nooksack River where applications of the pesticide EDB to farm fields has contaminated both surface and groundwater.

The 1989 plan called for the Authority to limit its activities to informing Ecology of the extent of public concern for this issue, and supporting U.S. Geological Survey (USGS) research on groundwater transport. USGS has an ongoing regional aquifer-system analysis (RASA) program.

Human Health Risks

Human health risks associated with Puget Sound and its resources can be categorized into two general areas: (1) human health implications associated with direct physical contact with the shorelines or waters of the Sound; and (2) health implications associated with the recreational and commercial harvest and ingestion of sea vegetables, shellfish, and fish from the Sound.

Concentrations of biological and chemical contaminants are typically highest in urbanized embayments around the Sound. Algae, shellfish, and groundfish living near these polluted areas have been found to contain high levels of certain contaminants. While most of the seafood captured in the Sound is probably consumed with no unpleasant or dangerous side effects, the routine ingestion of large quantities of contaminated seafood over a lifetime may pose a health risk to a consumer of Puget Sound resources.

The 1989 plan stated the Authority would continue to participate on the inter-agency human health risk work team that is examining potential health risks associated with the consumption of Puget Sound seafood. The Authority was also to continue to review and comment on this issue and will encourage the coordination of regulatory programs related to human health risks. Authority staff participated in the risk assessment team and have addressed the human health issue in comments to agencies reviewing shoreline construction permits.

Nutrient Effects

Sewage effluent discharged into the fresh and marine waters of the Puget Sound area contains high levels of both organic and inorganic forms of nitrogen and phosphorus. Other sources of excess nutrients include fertilizers, animal wastes, and on-site sewage disposal (septic) systems. These nutrients can, in certain instances, stimulate the growth of phytoplankton, sediment microalgae, macroalgae, kelp, seagrasses, and marsh plants, particularly in stratified bays and inlets and along shorelines where nutrients might otherwise be limiting. Excessive phytoplankton growth from human-caused introduction of nutrients can lead to oxygen depletion in the bottom waters. This is because the sinking and decomposition of plankton and other organic matter can create high biochemical oxygen demand (BOD) and reduce oxygen levels in areas that are not well mixed with oxygen-rich surface waters.

Fish kills and other biological effects may occur as a result of this depleted oxygen. For example, just a few decades ago excessive nutrients from human sewage led to the very serious degradation of Lake Washington. The lake has subsequently been cleaned up by diversion of nutrient discharges. Researchers have shown that shallow, poorly-mixed stratified bays and inlets in the Sound are particularly susceptible to problems created by excess nutrients. Budd Inlet, Dabob Bay, Dyes Inlet, Liberty Bay, and Lynch Cove have had documented cases of periodic oxygen depletion.

Nutrients may be contributed to the Sound from a variety of sources other than sewage treatment plants. These include stormwater, on-site sewage disposal (septic) systems, nonpoint runoff from heavily fertilized agricultural and forest lands, industrial discharges (e.g., pulp and paper mills), and atmospheric deposition.

The increased population projected for the Puget Sound area will result in increased land disturbance, nonpoint runoff, and sewage flows. Nutrient effects in shallow stratified bays and inlets around the Sound may increase unless sources of excess nutrients are detected and controlled. Although there have been few recent reported fish kills in the marine waters of the Sound, there may be other biological effects from nutrient enrichment that are currently not well understood or are not being detected. For example, there is some evidence that the growth and population dynamics of the planktonic dinoflagellate *Gonyaulax catenella*, the organisms that causes paralytic shellfish poisoning (PSP), may be influenced in some cases by anthropogenic additions of nutrients. Nutrient inputs may shift the natural population patterns of phytoplankton species and have effects further up the food chain. In addition, macro-algal growth may be enhanced by nutrient additions in the nearshore and shoreline areas of the Sound. Further research is required to address these questions as well as others dealing with the potential effects of nutrients in Puget Sound.

The 1989 plan referred this issue to the Committee on Research in Puget Sound, and indicated that the Authority would continue to review new information on nutrient effects in the Sound. Research on nutrients in Puget Sound is being funded with EPA money under the PSEP. Authority staff have been involved in development of the studies.

Plastic Debris in Marine Waters

The world production of plastics more than doubled between 1975 and 1981. Plastics have become increasingly popular because they are inexpensive, lightweight, and durable. Because of this durability, plastics are causing substantial pollution of marine waters. Plastics have become the most common objects sighted at sea. They typically comprise one-half to two-thirds or more of all surface objects sighted. Studies have indicated that the coasts of Oregon and

Washington have one of the highest concentrations of marine plastic debris in the world. In fact, a recent Japanese survey concluded that the Washington coast had a higher percentage of floating debris than anywhere else in the Pacific. This form of marine pollution is likely to increase because of the persistence and increasing production of plastics.

Plastic pollution is harmful to the fishing industry and other boaters. Plastic ropes or fishing nets can ensnare boat propellers and can block water intake valves.

The most serious concern of marine plastic pollution, however, is the harm to marine life through entanglement or ingestion. Entanglement can lead to drowning, starvation, strangulation, or predation. Loss of limbs through infection from entanglement is also common. It is estimated that between 30,000 and 50,000 fur seals die each year from entanglement. There is concern that this is a primary factor in the species' population decline. Entanglement can occur from trawl webbing, cargo strapping bands, six-pack rings, ropes, lines, and net fragments. In addition, lost or discarded fishing nets and crab pots continue to catch fish, crabs, diving seabirds, and other forms of marine life for several years after they are lost.

Ingestion of plastics also has harmful consequences for marine life. The impact of ingestion varies with the species and the amount ingested, but malnutrition or starvation due to blockage of the intestine or ulceration of the stomach is the primary concern. Plastic pellets resulting from resin spills and the physical degradation of plastic products can be mistaken for fish eggs or other food sources. Sea turtles readily ingest plastic bags or plastic sheeting that they mistake for jellyfish. This is a particular concern because all sea turtle species are listed as either threatened or endangered under the federal Endangered Species Act.

The 1989 plan indicated that the Authority would continue to participate in the state's Marine Plastic Debris Task Force and track its implementation efforts. The issue was also to be coordinated with the Boaters Task Force, especially in terms of boater education. Other agency efforts would be reviewed and continued, including the Public Involvement and Education Fund (PIE-Fund) projects. Authority staff involvement has been limited due to funding constraints. Authority staff participated in the Marine Plastic Debris Task Force. A PIE-Fund project that addressed marine debris was completed. The project established recycling collection sites at Squalicum Harbor to educate mariners on the impact of garbage and to reduce the rising garbage costs at the harbor. Three brochures and a four-color poster were produced and distributed.

In December 1988 the Marine Plastic Debris Action Plan for Washington State was released by the Department of Natural Resources. Prepared by the Marine Plastic Debris Task Force, it contains 20 action recommendations for how to reduce and respond to plastic marine debris. The Authority is committed to continuing work on this issue, including possibly adding program language in future plans.

Transboundary Pollution

Washington state and the Canadian province of British Columbia share the Strait of Juan de Fuca and part of the Strait of Georgia. Contaminants entering British Columbia's waters from point and nonpoint sources often end up in the Strait of Georgia and can be transported into Puget Sound. It is unclear exactly how much pollution is transported either way between British Columbia and Washington, but it appears prevailing winds can have a great influence, especially on floating material such as oil or debris. Studies of currents and floating

material have shown that the marine waters of British Columbia and Washington are part of the same regional system of the North Pacific.

Nearly all of the problems identified in the Puget Sound Water Quality Management Plan are also problems in Canada. Although pollution originating in the Puget Sound basin may be transported to Canada, the Puget Sound plan should help reduce the volume. The need for an international water quality management plan that could comprehensively address pollution issues on both sides of the border should be examined.

The 1989 plan called for the Authority to encourage joint efforts with the Canadian and British Columbia governments to examine scientific issues, planning, and prevention technologies associated with transboundary pollution. The Authority was to request that the International Joint Commission give some attention to transboundary water quality concerns in Puget Sound, and was to seek other mechanisms to prompt work on this issue. The Authority has continued to work with Canadian and British Columbia agencies to improve monitoring and provide information on transboundary issues but has not contacted the International Joint Commission. Authority staff have assisted Ecology in representing Washington state on the States/B.C. Oil Spill Task Force. The Task Force is discussed in the Spill Prevention Program.

Another way to deal with the transboundary issues would be to declare the Strait of Juan de Fuca and Georgia Strait an inland sea, and place it under the jurisdiction of an international treaty similar to that used for managing the Great Lakes. Whatever the means, the Authority is fully committed to coordinating with, and including, the government of British Columbia in its plan development and implementation efforts.

Treatment of Domestic Wastes

Homes and businesses generate about 80 to 100 gallons of domestic wastewater per person per day. With nearly three million people living in the Puget Sound area, this means that over 300 million gallons of domestic sewage are produced each day. About 75 percent of the area's population is connected to sanitary sewer systems, so over 245 million gallons of domestic sewage are collected and delivered to wastewater treatment plants around the Sound each day.

Many elements of the Puget Sound plan and regulatory programs administered by Ecology and EPA deal with the treatment of domestic wastes. However, there are a number of issues that are not being adequately being addressed by the plan or existing regulatory systems. Some of these issues include: the need for integration of programs dealing with domestic wastewater; the correction of emergency overflows, combined sewer overflows, and failing infrastructure; the production, treatment, use, and disposal of domestic sludge; and the use and effects of chlorine in the wastewater treatment process.

Federal and state laws and other government initiatives require that municipalities and other local governments address a range of water quality management issues, many of which include costly capital construction. Although a significant amount of planning may occur on these issues, the planning may not be comprehensive enough to adequately integrate the institutional, financial, and engineering aspects of these issues.

Treatment bypasses occur when sewer systems either malfunction (e.g., emergency overflows and broken pipes) or become overloaded because of the influx of excessive rainfall runoff (e.g., combined sewer overflows or CSOs). Treat-

ment bypasses, as well as leaks or breaks in sewer pipes, discharge large volumes of raw sewage directly into the fresh and marine waters of the area.

Municipal sewage sludge is the semi-solid material left over after treatment of sewage, while septage is the semi-solid material pumped from septic tanks and marine holding tanks. The production of sludge in the region will double by the early 1990s as new secondary treatment plants begin operation. Sludge may be treated to reduce its volume and to lessen risks to public health and the environment. Treated sludge is a useful fertilizer, and most sludge in the Puget Sound area is applied to the land for silviculture, land reclamation, and composting. Certain risks are associated with the use of sludge due to its contamination with heavy metals, pathogens, and toxic organic compounds. Cadmium in sludge can be taken up by plants and potentially could poison animals or humans. Excessive use of sludge can also contaminate groundwater or surface water with nitrates.

Chlorine is applied to wastewater in the final stages of treatment to kill bacteria, viruses, and protozoans that may be harmful to humans. However, chlorination of sewage effluent may create other problems in the fresh and marine waters where treated wastewater is discharged. Chlorine can chemically combine with organic substances in the effluent and form highly toxic chlorinated organic compounds. Chronic toxicity effects have been detected in fish exposed to low concentrations of residual chlorine compounds in water.

Chlorination may kill the microbial organisms (usually fecal coliform and fecal streptococci bacteria) that serve as indicators of the potential presence of harmful organisms while allowing pathogenic viruses and other microorganisms to pass through the treatment process unharmed by the chlorine and undetected (depending on the degree and type of chlorination treatment used). Researchers have found that chlorine-treated wastewater effluent may contain viruses even though no fecal coliform bacteria are present. This is a public health concern because viruses cause many of the diseases that are spread by the presence of domestic wastewater, and most of the more important viruses cannot be easily measured with existing technology.

The 1989 plan directed the Authority to limit its activities on these issues to reviewing and commenting on regulations and related programs proposed by Ecology and by federal and local governments. Authority staff have commented on wastewater discharge permits but have done little else concerning these issues.

Other Issues

The 1989 plan discussed other issues in even less detail than that of the preceding issues. These issues were islands, public access to beaches, sole source aquifers, and fecal bacteria contamination from seals. Based on the comments received, little Authority action was planned.

The Authority decided to adopt a general policy to consider the special needs of islands and ensure that all plan programs give special consideration to island issues. The Authority will also encourage other agencies to give islands special consideration in their respective programs. In addition, the next State of the Sound Report will include a separate section discussing island ecology and the special issues related to islands in the Sound.

The Authority decided to support and encourage improved and expanded public access to Puget Sound shorelands. The Authority would continue to review and comment on other agency's programs related to this issue, including

public access aspects of Ecology's shorelands program and public access acquisition efforts by the Department of Natural Resources.

The Authority decided to address sole source aquifers only by reviewing and commenting on Ecology's groundwater program and encouraging the special protection of sole source aquifers.

The issue of fecal coliform bacteria contamination generated by seal populations was to be referred to the Department of Wildlife for consideration.

THE 1991 UNFINISHED AGENDA

The following topics have been identified as issues the Authority should consider for possible inclusion in future Puget Sound plans:

- How to integrate the Puget Sound Estuary Program and the Puget Sound plan with growth management programs.
- How to integrate the Puget Sound Estuary Program and the Puget Sound plan with the Environment 2010 program.
- How to coordinate the proposed designation of a federal Marine Sanctuary in the San Juan Islands area with the Puget Sound Estuary Program and the Puget Sound plan.
- Whether there are innovative approaches that would use market forces to more efficiently reduce the production and discharge of wastes.
- How to effectively prohibit any new discharges to Puget Sound and its tributaries unless it can be demonstrated that the proposed discharge would enhance the receiving waters or correct pollution caused by an existing, permitted, activity or activities.

GROWTH MANAGEMENT

Problem Definition

The population of the Puget Sound basin is increasing rapidly. The 1989 population of the 12 counties in the Puget Sound basin is over 3.2 million, projected to be 4.4 million by 2010. This is a 40 per cent increase, an additional 1.2 million people or about 480,000 households. This population increase is equal to the total 1989 populations of the state's 10 largest cities—Seattle, Spokane, Tacoma, Bellevue, Everett, Federal Way, Yakima, Bellingham, Vancouver, and Renton.

Population densities projected are to increase from an average of 0.31 persons per acre today to 0.43 per acre in 2010 for the entire basin. King County densities are projected to increase from 1.1 per acre today to 1.4 in 2010 and 1.55 in 2020. Snohomish County densities are projected to increase from 0.3 per acre now to 0.5 in 2010 and 0.6 in 2020. By 2020 Snohomish County will likely be as "full" as Pierce County is today. By 2010 Kitsap County will likely be as crowded as King County is today.

Development of houses, roads, schools, commercial, and entertainment facilities for this new population results in a variety of environmental threats to Puget Sound. Conversion of land from agricultural and forestry uses to suburban and urban uses drastically reduces wildlife habitat and open space. Trees

and crops which take in carbon dioxide and release oxygen continue to be replaced with cars, trucks, wood stoves, and other sources of regional air pollution and global warming. Present patterns of growth place people further from the historic urban cores. This forces increased road building and automobile use and results in proportionately more homes on septic systems, a potential problem given the poor drainage of much of the region's soils. The construction associated with new development increases stormwater runoff and flooding problems and creates nonpoint source pollution problems and threats to groundwater in formerly undeveloped portions of the watershed.

Institutional Problems

Patterns of development are governed by local government comprehensive plans and zoning requirements. Decisions about these programs have not generally included any comprehensive review of the environmental impacts of different development patterns. The desire to slow suburban development has often resulted in requirements for larger lots for new homes. But this can actually result in more sprawl.

Programs like the Puget Sound plan have attempted to reduce the potential environmental effects of development. Thus new developments would have better on-site septic systems and would have better stormwater controls than past developments. But these programs have not addressed the public policy issues concerning concentration or limitation of growth in certain areas or the pros and cons of various growth management strategies.

Growth Strategies Commission

On August 31, 1989, Governor Booth Gardner created the Growth Strategies Commission (GSC) to review issues related to growth management and recommend a statewide course of action. The Growth Management Act (SHB 2929), elaborating on the governor's original request, asked the commission to tackle the most complex growth issues.

The GSC's final recommendations were submitted to the governor in September 1990. Crucial areas addressed in the report were: planning for a statewide growth strategy; protecting the environment; connecting greenways and separating cities; conserving resource lands; preserving lands and resources of statewide significance; sharing economic growth; making our cities more livable; providing affordable housing; linking land use and infrastructure; resolving NIMBY (Not In My Back Yard) problems; resolving the roles of cities, counties, and special districts; and overseeing the state's growth strategy.

Growth Management Act

On April 1, 1990, the Washington State Legislature passed the Growth Management Act (Chapter 17, Laws of 1990, 1st ex. sess., SHB 2929). SHB 2929 includes 13 broad policy goals to guide development of local comprehensive plans and development regulations:

1. Encourage development in areas where adequate public services and facilities or can be provided in an efficient manner.
2. Reduce sprawl.
3. Encourage efficient and multimodal transportation systems based on regional priorities and coordinated with comprehensive plans.
4. Encourage the availability of affordable housing.



5. Encourage economic development throughout the state consistent with the comprehensive plans.
6. Private property shall not be taken for public use without just compensation. Property rights shall be protected from arbitrary and discriminatory actions.
7. Timely processing of permits, fair and predictable processes.
8. Maintain and enhance the state's natural resource industry, including productive timber, agriculture, and fisheries. Encourage conservation of productive lands and discourage incompatible uses.
9. Encourage retention of and increase access to open space and recreation areas.
10. Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.
11. Encourage citizen participation and coordination.
12. Ensure that those public facilities and services necessary to support development are adequate to serve the development when the development is available for occupancy and use without decreasing current service levels below local minimum standards.
13. Encourage historic preservation.

The act requires comprehensive plans in all counties which have populations of 50,000 or more and which increased their population more than 10 per cent in the last 10 years. The cities in these counties must also prepare comprehensive plans. This applies to nine counties in the state: King, Pierce, Snohomish, Kitsap, Whatcom, Skagit, Island, and Thurston counties. Counties with fewer than 50,000 people but a 10-year population increase of more than 20 per cent (and the cities within them) are required to prepare comprehensive plans but may opt out of the process. This applies to San Juan, Mason, and Jefferson counties. Any other county or city may voluntarily comply. Interim regulations to protect certain uses must be in place by September 1991. Comprehensive plans must be in place by July 1, 1993.

Mandatory elements of the comprehensive plan are land use, housing, capital facilities, utilities, a rural element, and transportation. Of specific interest is the requirement that "[w]here applicable, the land use element shall review drainage, flooding, and storm water run-off in the area and nearby jurisdictions and provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state, including Puget Sound or waters entering Puget Sound."

As part of the comprehensive plan process, counties must designate urban growth areas within which urban growth shall be encouraged. Urban growth cannot occur outside the urban growth area.

Local governments are required to develop development regulations to implement the comprehensive plan and adopt them within one year of comprehensive plan adoption. Activities of these governments and capital budget decisions must conform with the comprehensive plan. Special districts must also comply with state goals and local plans.

These plans must establish urban growth boundaries around population centers and delineate where new development could be located. These areas would correspond to those areas with infrastructure in place.

Local government activities must be consistent with the comprehensive plan. This is a departure from the current arrangement where the courts have ruled that local activities need not be consistent with comprehensive plans. Plans may include a conservation element which would address water quality, watersheds, fisheries, wildlife and other natural resources.

Perhaps the most important aspect of the latest effort to address growth management is the requirement of concurrency—the provision of infrastructure prior to development approval. This would work in conjunction with the requirement for urban growth areas to direct growth to those areas better able to handle it and areas where additional growth is desirable.

SHB 2929 provides for identification and protection of forest, agriculture, mineral, and sensitive areas. The Department of Community Development (DCD) adopted guidelines for designation of these areas, including critical areas. "Critical areas" as defined in SHB 2929 include wetlands, areas with critical recharging effect on aquifers used for drinking water, and fish and wildlife habitat. Cities and counties must designate and implement development regulations by September 1, 1991. Regulations must preclude land uses or development that is incompatible with the critical areas. Regulations must also assure that the use of lands adjacent to agricultural, forest, or mineral resource lands will not interfere with the continued use. Regulations may not prohibit uses permitted prior to their adoption and will remain in effect until the county or city adopts development regulations implementing its comprehensive plan.

Development Impact Fees

The Growth Management Act authorizes local governments to establish impact fee programs to assist them in ensuring that proper infrastructure is available to service new development. Fees collected shall only be used for system improvements reasonably benefitting the new development and shall only be imposed for improvements that are reasonably related to the new development. Fees may be collected and spent only for public facilities addressed by a capital facilities plan element. After July 1, 1993, authorization to collect fees shall be contingent on the local government adopting or revising a comprehensive growth management plan.

A city or county may impose an excise tax of one-quarter of one percent of the selling price on the sale of real property. Revenues must be used for financing capital projects specified in the comprehensive plan as well as for housing assistance.

Integration of Growth Management Activities and the Puget Sound Estuary Program

There are several areas where the activities of the Authority and the Puget Sound Estuary Program can be integrated with the growth management initiatives.

1. The Authority, EPA, and Ecology can provide technical assistance to the Department of Community Development (DCD) and local governments in the Puget Sound basin in developing guidelines and approaches to growth management and environmental protection.

2. Plan programs can provide for coordination and integrations with the growth management effort. The 1991 plan contains revisions in several programs to accomplish this.

3. The Authority can work with DCD to prepare the guidelines for growth management planning in a way that is consistent with the Puget Sound plan. For example, DCD can define fish and wildlife habitat conservation areas in a way that enhances the Fish and Wildlife Habitat Protection Program of the Puget Sound plan.

4. The Authority, EPA, and Ecology can work with DCD to ensure that various grant programs available to local governments (including the Centennial Clean Water Account, federal programs such as Section 319 of the Clean Water Act, and the grant program established by DCD) are operated to get the job done with the greatest environmental benefit and the least duplication of effort.

THE ENVIRONMENT 2010 PROGRAM

The Environment 2010 Program was initiated by the Department of Ecology in 1988. Its objective is the development of a balanced plan for environmental protection for all of Washington state. The project has involved several phases, including initial scoping, preparation of technical studies which forecast the condition of many Washington state resources in 2010, the preparation of a summary report, numerous public meetings to discuss the results and determine what Washington should look like in 2010, and the preparation of a statewide plan for environmental protection.

While the Puget Sound Estuary Program has focused on water quality, wetlands, and fish and wildlife habitat, the 2010 program has attempted to review all aspects of the environment, including air pollution, hazardous waste, groundwater, and many other issues. Based on the reports and public meetings, the major environmental challenges facing Washington are:

- Raising environmental awareness and responsibility;
- Curbing consumption;
- Fostering consensus and cooperation;
- Improving air quality;
- Improving water quality;
- Protecting the land;
- Preserving wetlands;
- Protecting fish and wildlife;
- Improving waste management;
- Confronting problems with pesticides;
- Confronting the specter of global warming; and
- Building knowledge about the environment.

The Environment 2010 Action Agenda was submitted to the governor in July 1990. The action agenda provides recommendations for reducing threats to the state's environmental resources. These final recommendations are presented in varying degrees of detail—some are concrete ideas already being pursued, whereas others are suggestions on which discussion has just begun. State and local governments, community groups, businesses and industry, and private citizens are each encouraged to play a role in confronting and resolving these issues, changing attitudes and behaviors, and implementing alternatives.

Authority members and staff, along with the other PSEP co-managers, EPA and Ecology, participated throughout the development of the 2010 program. The Environment 2010 action plan and the Puget Sound plan should, therefore, be compatible.

Possible Estuary Program Actions

The Authority, EPA, and Ecology can work together to ensure that the statewide 2010 plan and the Puget Sound plan are fully compatible and support each other.

NORTHERN PUGET SOUND MARINE SANCTUARY

By direction of Congress, the National Oceanic and Atmospheric Administration (NOAA) is conducting a study of northern Puget Sound for possible designation as a national marine sanctuary. The study area under consideration includes, in general, the waters surrounding the islands of San Juan County; waters off Cherry Point and Lummi Bay in Whatcom County; waters surrounding Cypress Island in Skagit County; waters surrounding Smith and Minor Islands and Partridge Banks in Island County; waters surrounding Protection Island in Jefferson County; and waters up to the high water mark in Discovery Bay, Sequim Bay, and Dungeness Bay and surrounding Dungeness Spit in Clallam County. The proposed western boundary follows longitude 123° 10' west to the Canadian border. Some or all of the study area could be included if a sanctuary is established.

Title III of the Marine Protection, Research and Sanctuaries Act of 1972 authorizes the Secretary of Commerce to designate specific marine areas as national marine sanctuaries to protect their distinctive conservation, recreational, ecological, historical, research, educational, and aesthetic qualities. The Act is administered by NOAA through the Office of Ocean and Coastal Resource Management, Marine and Estuarine Management Division.

The planning process for a national marine sanctuary involves the preparation of a draft environmental impact statement/management plan (DEIS/MP) and specific regulations. The DEIS/MP will examine the impacts of designation of northern Puget Sound as a sanctuary, including an analysis of alternatives for protecting and managing the proposed sanctuary's resources. Subsequent steps in the designation process include public hearings on the DEIS/MP and preparation and submission of a prospectus to Congress. The prospectus for northern Puget Sound is scheduled for completion by March 31, 1991. If the prospectus is approved by Congress, the final step will include the preparation of a final management plan/environmental impact statement and the development and issuance of sanctuary designation determination and findings. All final terms of the plan must be approved by the governor of Washington.

The proposed boundaries of the Northern Puget Sound Marine Sanctuary lie within the planning area of the Puget Sound Water Quality Management Plan. Adoption of the 1991 plan as the Puget Sound Comprehensive Conservation and Management Plan places the marine sanctuary area under the jurisdiction



of the federal-state Puget Sound Estuary Program. These overlapping state and federal jurisdictions raise a number of important questions regarding management authorities, responsibilities, and coordinating functions.

Possible Estuary Program Actions

1. The Authority, on behalf of the estuary program, is participating and providing recommendations during the marine sanctuary planning process, providing technical information and assistance, and assuring consistency with the Puget Sound plan.
2. The estuary program can consider changes to the Puget Sound plan which would address problems identified during the marine sanctuary process. This could be considered as an alternative or in addition to the designation of the marine sanctuary. These changes could also serve as a combined approach that would bring overlapping federal and state authorities to bear on the problems in an integrated fashion.

INCENTIVES

As environmental regulations have become more common, their cost has become apparent to two major groups. Businesses have found that it is very expensive to comply with regulations, particularly when they are very rigid, allowing for little in terms of innovative responses. Government regulators have also found that enforcement of the regulations and the monitoring of compliance is costly. In fact, one chronic difficulty for government is having adequate resources to fund these activities.

This situation has caused many regulators, environmental planners, and business groups to seek new approaches to environmental policy that are at least as effective as traditional regulatory approaches to preventing degradation of the environment. One approach is using market-based incentives to reach predetermined pollution abatement goals. Environment 2010 prepared an issue paper on this topic.

This approach, also called environmental economics, is a way of harnessing the forces of the marketplace in order to most effectively and efficiently achieve specific environmental goals and standards. Government regulators (and the public) establish specific environmental goals. Then mechanisms are brought into play which take advantage of the forces of the marketplace in our economy.

Two types of market-based incentives that have been used or proposed elsewhere are subsidies, to provide a positive inducement to do something, and taxes or fees, which provide a negative incentive.

Subsidies

Subsidies can be both direct and indirect. Government can provide direct financial backing or technical assistance to businesses as they work to develop more efficient and cost-effective practices which generate less waste. This direct form of assistance can be tailored so that it will not be provided unless the business first makes a "good faith" effort on its own. The proposal for a university-based institute to develop pollution control technologies included in the Municipal and Industrial Discharges Program (element P-27) represents a proposed state subsidy of technology development. Indirect subsidies can be provided through various sorts of tax breaks for costs associated with waste reduction. Washington state provides tax benefits for pollution control equipment in certain cases.

Taxes and Fees

Taxes and fees are a way of providing a negative incentive so that a business will be motivated to seek a way of decreasing the amount of wastes that are being generated. The fees would be levied by government in addition to the costs that have to be paid for treatment, storage, or disposal of the waste. Economic theory would hold that this fee or tax should be high enough that it would reasonably cover all of the social costs incurred as a result of the long-term environmental effects of the existence of the waste. The business decision to produce, or continue producing, the waste would then be based on the true costs controlled by the decision. Many of these costs are not normally accounted for today.

It is important to recognize that a market-based incentive system cannot be successful without a major commitment by regulators to enforce the program. Since permits would be for a set quantity of discharge, and the marketable system gives a significant economic value to the exact quantity discharged, monitoring the exact amount discharged by each outfall would be more necessary than with the current technology-based permit system. The method also includes an assumption that it is the total quantity discharged, regardless of its location or form, that affects the environment. Yet in Puget Sound we have a pattern of sediment "hot spots" associated with individual discharge points. So a system of marketable discharge permits for Puget Sound would need an additional mechanism to account for the locations of discharges.

Possible Estuary Program Actions

The Authority could undertake further research into increasing the use of market incentives to protect Puget Sound. Issues to be considered would include:

- What market pressures exist in the current regulatory program and how they enhance or obstruct cost-effective protection of the environment;
- How market pressures could be brought to bear to improve conditions in Puget Sound; and
- What changes in law or regulation would be required to better use market incentives.

OTHER ISSUES

There were a number of other planning activities that could have been addressed in this chapter. They included the Sustainable Forestry Roundtable, Ag 2000, and Transportation 2000.

Reviewers of the draft 1991 Puget Sound plan were encouraged to recommend other issues for Authority consideration but no recommendations were received.

Appendix A. Acronyms

AET —Apparent effects threshold	NPDES —National Pollutant Discharge Elimination System	WDIS —Wastewater Discharge Information System
AKART —All known, available, and reasonable treatment	NPS —National Park Service	WDOT —Washington Department of Transportation
BMP —Best management practice	OSC —Outer continental shelf	
BOD —Biochemical oxygen demand	PAH —Polycyclic (polynuclear) aromatic hydrocarbon	
CCMP —Comprehensive Conservation and Management Plan	PCB —Polychlorinated biphenyl	
CERCLA —Comprehensive Environmental Response, Compensation, and Liability Act (also known as “Superfund”)	PCHB —Pollution Control Hearings Board	
CFR —Code of Federal Regulations	PIE-FUND —Public Involvement and Education Fund	
CSO —Combined sewer overflow	POTW —Publicly-owned treatment works	
CWA —Clean Water Act	PSDDA —Puget Sound Dredged Disposal Analysis	
DCD —Washington Department of Community Development	PSEP —Puget Sound Estuary Program	
DNR —Washington Department of Natural Resources	PSP —Paralytic Shellfish Poisoning	
DSHS —Washington Department of Social and Health Services (currently known as Washington Department of Health)	PSWQA —Puget Sound Water Quality Authority	
EIS —Environmental Impact Statement	RCRA —Resource Conservation and Recovery Act	
EPA —U.S. Environmental Protection Agency	RCW —Revised Code of Washington	
FDA —U.S. Food and Drug Administration	SCS —U.S. Soil Conservation Service	
FTE —Full-time equivalent	SEPA —State Environmental Policy Act	
FY —Fiscal year	SMA —Shoreline Management Act	
GIS —Geographic Information system	SPCC —Spill prevention control and countermeasure	
HPA —Hydraulic Project Approval	SPI —Superintendent of Public Instruction	
MGD —Millions of gallons per day	T/F/W —Timber/Fish/Wildlife Project	
MOU —Memorandum of Understanding	USC —United States Code	
MSD —Marine sanitation device	USFWS —U.S. Fish and Wildlife Service	
MTCA —Model Toxics Control Act	WAC —Washington Administrative Code	
NEPA —National Environmental Policy Act	WDF —Washington Department of Fisheries	
NOAA —National Oceanic and Atmospheric Administration	WDW —Washington Department of Wildlife	

Appendix B. Glossary

ACUTE TOXICITY

Any toxic effect that is produced within a short period of time, generally 96 hours or less. Although the effect most frequently considered is mortality, the end result of an acute effect could be any harmful biological effect.

AEROBIC

Living, active, or occurring only in the presence of oxygen. For example, soil microorganisms which degrade sewage effluent from septic systems need oxygen in order to function.

ALGAE

Aquatic, nonflowering plants that lack roots and use light energy to convert carbon dioxide and inorganic nutrients such as nitrogen and phosphorus into organic matter by photosynthesis. Common algae include dinoflagellates, diatoms, seaweeds, and kelp. An algal bloom can occur when excessive nutrient levels and other physical and chemical conditions enable the algae to reproduce rapidly.

AMBIENT MONITORING

Monitoring that is done to determine existing environmental conditions, contaminant levels, rates, or species in the environment, against which future conditions can be compared.

AMPHIPODS

Small shrimp-like crustaceans such as sand fleas and related forms. Many live on the bottom (i.e., are benthic) and feed on algae and detritus.

ANADROMOUS FISH

Species, such as salmon, which hatch in fresh water, spend a large part of their lives in the ocean, and return to fresh water rivers and streams to reproduce.

ANTHROPOGENIC

Effects or processes that are derived from human activity, as opposed to natural effects or processes that occur in the environment without human intervention.

APPARENT EFFECTS THRESHOLD (AET)

The highest sediment concentration of an individual chemical contaminant

which is not associated with adverse biological effects. Samples with concentrations of contaminants above the AET have always shown adverse biological effects.

AQUACULTURE

The controlled cultivation and harvest of aquatic plants or animals (e.g., edible marine algae, clams, oysters, and salmon).

AQUIFER

The underground layer of rock or soil in which groundwater resides. Aquifers are replenished or recharged by surface water percolating through soil. Wells are drilled into aquifers to extract water for human use.

AROMATIC

A chemical substance characterized by the presence of at least one benzene ring. These substances may have a strong smell and are often persistent in the environment due to the stability of the benzene ring.

BASELINE STUDY

A study that documents the existing state of an environment to serve as a baseline against which future changes are measured.

BENTHIC ORGANISMS

Organisms that live in or on the bottom of a body of water.

BEST MANAGEMENT PRACTICE (BMP)

A method, activity, maintenance procedure, or other management practice for reducing the amount of pollution entering a water body. The term originated from the rules and regulations developed pursuant to Section 208 of the federal Clean Water Act (40 CFR 130).

BIOACCUMULATION

The process by which a contaminant accumulates in the tissues of an organism. For example, certain chemicals in food eaten by a fish tend to accumulate in its liver and other tissues.

BIOASSAY

A test procedure that measures the response of living plants, animals, or tis-

suess to potential contaminants. For example, marine worms have been exposed to the sediments of Puget Sound, and their responses have been used to determine areas in the Sound where the sediments may be harmful to life.

BIOCHEMICAL OXYGEN DEMAND (BOD)

The quantity of oxygen-demanding materials present in a sample as measured by a specific test. A major objective of conventional wastewater treatment is to reduce the biochemical oxygen demand so that the oxygen content of the water body will not be significantly reduced. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

BIODEGRADATION

The conversion of organic compounds into simpler compounds through biochemical activity. Toxic compounds can sometimes be converted into nontoxic compounds through biodegradation. In some cases complex compounds are first converted into intermediate substances that can be more toxic than the original substance.

BIOMAGNIFICATION

The process by which concentrations of contaminants increase (magnify) as they pass up the food web such that each animal in the food web has higher tissue concentrations than did its food. For example, concentrations of certain contaminants can increase as they are passed from plankton to herring to salmon to seals.

BIOTA

The animals, plants, and microbes that live in a particular location or region.

BIVALVE

An aquatic invertebrate animal of the class Bivalvia. Bivalves, such as clams and oysters, have two shells (valves) and most are filter feeders.

CARCINOGENIC

Capable of causing cancer.

CENTENNIAL CLEAN WATER FUND (CCWF) also known as the WATER QUALITY ACCOUNT

In 1986 legislation was passed creating the Water Quality Account in the state treasury (RCW 70.146). The purpose of the account is to provide financing of water pollution control facilities and activities. The account receives revenue from a tax on tobacco products. Ecology, in adopting rules for administration of the account, has named it the Centennial Clean Water Fund.

CERTIFIED SHELLFISH BED

An area where commercial shellfish harvesting is approved by the Washington Department of Social and Health Services (DSHS), based on measurements of fecal coliform bacteria in the overlying waters. Fecal coliform bacteria are used as an indicator of human health risk.

CHRONIC TOXICITY

Any toxic effect on an organism that results after exposure of long duration (often 1/10th of the life span or more). The end result of a chronic effect can be death although the usual effects are sublethal (e.g., inhibited reproduction or growth). These sublethal effects may be reflected by changes in the productivity and population structure of the community.

CLEAN WATER ACT (CWA)

Also known as the federal Water Pollution Control Act (33 U.S.C. 1251 et seq.).

CLEANUP ACTIVITIES

Actions taken by a public agency or a private party to correct an environmental problem. Activities generally consist of the treatment or removal from the environment of contaminants introduced by past practices (for example, capping part of a public park contaminated with carcinogenic compounds or digging up and incinerating soil contaminated with dioxin).

CODE OF FEDERAL REGULATIONS (CFR)

The compilation of federal regulations adopted by federal agencies through the rulemaking process. For example, pretreatment regulations are found in 40 CFR 403.

COLIFORM BACTERIA

A type of bacteria that is coil or helix shaped. Fecal coliform bacteria are those coliform bacteria that are found in the intestinal tracts of mammals.

The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces. These organisms may also indicate the presence of pathogens that are harmful to humans. High numbers of fecal coliform bacteria therefore limit beneficial uses such as swimming and shellfish harvesting.

COMBINED SEWER OVERFLOW (CSO)

A pipe that discharges untreated wastewater during storms from a sewer system that carries both sanitary wastewater and stormwater. The overflow occurs because the system does not have the capacity to transport, store, or treat the increased flow caused by stormwater runoff.

COMBINED SEWER SYSTEM

A wastewater collection and treatment system where domestic and industrial wastewater is combined with storm runoff. Although such a system does provide treatment of stormwater, in practice the systems may not be able to handle major storm flows. As a result, untreated discharges from combined sewer overflows may occur.

CONFINED DISPOSAL

A dispositional method that isolates dredged material from the environment. Confined disposal may be in aquatic, nearshore, or upland environments.

CONTAMINANT

A substance that is not naturally present in the environment or is present in amounts that can, in sufficient concentration, adversely affect the environment.

CONVENTIONAL POLLUTANT

Conventional pollutants as specified under the Clean Water Act are total suspended solids, fecal coliform bacteria, biochemical oxygen demand, pH, and oil and grease. Today a large number of nonconventional and toxic contaminants are of concern in addition to the conventional pollutants.

CUMULATIVE EFFECTS

The combined environmental impacts that accrue over time and space from a series of similar or related individual actions, contaminants, or projects. Although each action may seem to have a negligible impact, the combined effect can be severe.

DETENTION

The process of collecting and holding back stormwater for delayed release to receiving waters.

DISCHARGE, DIRECT OR INDIRECT

The release of wastewater or contaminants to the environment. A direct discharge of wastewater flows directly into surface waters while an indirect discharge of wastewater enters a sewer system.

DISINFECTION

The destruction of infectious agents such as bacteria or viruses. Most wastewater treatment plants use chlorine or bromine for disinfection.

DISPOSAL

Methods by which unwanted materials are relocated, contained, treated, or processed. Unless contaminants are converted to less harmful forms or removed from the material before disposal, they may be released again into the environment.

DISSOLVED OXYGEN

Oxygen that is present (dissolved) in water and therefore available for fish and other aquatic animals to use. If the amount of dissolved oxygen in the water is too low, then aquatic animals may die. Wastewater and naturally occurring organic matter contain oxygen-demanding substances that consume dissolved oxygen.

DOMESTIC WASTEWATER (SEWAGE)

Human-generated wastewater that flows from homes, businesses, and industries.

DREDGING

Any physical digging into the bottom sediment of a water body. Dredging can be done with mechanical or hydraulic machines, and it changes the shape and form of the bottom. Dredging is routinely done in many parts of Puget Sound in order to maintain navigation channels that would otherwise fill with sediment and block ship passage.

ECOSYSTEM

A community of living organisms interacting with one another and with their physical environment, such as a rain forest, pond, or estuary. Damage to any part of a complex system, such as Puget Sound, may affect the whole. A system such as Puget Sound can also be thought of as the sum of many interconnected ecosystems such as the rivers,

wetlands, and bays. Ecosystem is thus a concept applied to communities of different scale, signifying the interrelationships that must be considered.

EFFLUENT

The liquid that flows out of a facility or household into a water body or sewer system. For example, the treated liquid discharged by a wastewater treatment plant is the plant's effluent.

ENVIRONMENTAL IMPACT STATEMENT (EIS)

A document that discusses the likely significant impacts of a development project or a planning proposal, ways to lessen the impacts, and alternatives to the project or proposal. EISs are required by the national and Washington state environmental policy acts.

EROSION

Wearing away of rock or soil by the gradual detachment of soil or rock fragments by water, wind, ice, and other mechanical and chemical forces.

ESTUARY

A coastal water body where ocean water is diluted by out-flowing fresh water.

FECAL COLIFORM see COLIFORM BACTERIA

FECES

Waste excreted from animals.

FOREST PRACTICE

Any activity conducted on or directly pertaining to forest land related to growing, harvesting, or processing timber. These activities include but are not limited to: road and trail construction, final and intermediate harvesting, precommercial thinning, reforestation, fertilization, prevention and suppression of disease and insects, salvage of trees, and brush control. Forest practices are subject to regulation by the Washington Department of Natural Resources.

FULL-TIME EQUIVALENT (FTE)

The work one person does in one year—used to estimate costs and people needed to perform certain actions.

FUNGICIDE

A substance that destroys or inhibits growth of fungus.

GROUND FISH

Fish (also known as bottomfish) that live on or near the bottom of water bodies, for example, English sole.

GROUNDWATER

Underground water supplies stored in aquifers. Groundwater is created by rain which soaks into the ground and flows down until it is collected at a point where the ground is not permeable. Groundwater then usually flows laterally toward a river, lake, or the ocean. Wells tap the groundwater for use. (See **AQUIFER**)

HABITAT

The specific area or environment in which a particular type of plant or animal lives. An organism's habitat must provide all of the basic requirements for life and should be free of harmful contaminants. Typical Puget Sound habitats include beaches, marshes, rocky shores, the bottom sediments, intertidal mudflats, and the water itself.

HAZARDOUS WASTE

Any solid, liquid, or gaseous substance which, because of its source or measurable characteristics, is classified under state or federal law as hazardous and is subject to special handling, shipping, storage, and disposal requirements. Washington state law identifies two categories, dangerous and extremely hazardous. The latter category is more hazardous and requires greater precautions.

HERBICIDE

A substance used to destroy or inhibit growth of vegetation.

HOLDING TANK

An enclosed container used as part of a sewage disposal system on a boat. The tank is used to temporarily store sewage for later pumpout at a marina pumpout facility.

HUMAN HEALTH RISK

The risk or likelihood that human health will be adversely affected. Estimating health risks is a complex and inexact practice.

HYDRAULIC PROJECT APPROVAL (HPA)

Under the Hydraulic Code Rules, approval is required from Washington State Departments of Fisheries and Wildlife for certain activities in state waters that support fish life. A project approval is required for activities affecting state waters such as certain forest practices; culvert construction; bridge, pier, and piling construction; bulkheads; boat launches; dredging; etc.

HYDROCARBON

An organic compound composed of carbon and hydrogen; for example, petroleum compounds.

HYDROLOGIC CYCLE

The continual cycling of water between the land, the sea, and the atmosphere through evaporation, condensation, precipitation, absorption into the soil, and stream runoff.

IMPERVIOUS

A surface that cannot be easily penetrated. For instance, rain does not readily penetrate asphalt or concrete pavement.

INSECTICIDE

A substance, usually a chemical, that is used to kill insects.

INTERFERENCE

A contaminant can interfere with the normal sewage treatment plant process by diminishing the efficiency of the treatment process. For example, a toxic chemical can kill the beneficial bacteria in a treatment plant and interfere with the biological treatment process, thus causing the release of excessively contaminated effluent.

INTERTIDAL AREA

The area between high and low tide levels. The alternate wetting and drying of this area makes it a transition between land and water and creates special environmental conditions and habitats.

LAND USE

The way land is developed and used in terms of the types of activities allowed (agriculture, residences, industries, etc.) and the size of buildings and structures permitted. Certain types of pollution problems are often associated with particular land use practices, such as sedimentation from construction activities.

LEACHATE

Water or other liquid that has washed (leached) from a solid material, such as a layer of soil or debris. Leachate may contain contaminants such as organics or mineral salts. Rainwater that percolates through a sanitary landfill and picks up contaminants is called the leachate from the landfill.

LIVEABOARD

Those using a boat, other than a houseboat, as a primary dwelling.

LOADING

The total amount of material entering a system from all sources.

MARINE SANITATION DEVICE (MSD)

A device installed on a boat to treat or hold sewage. Section 312 of the federal Clean Water Act requires all vessels with installed toilets to have approved MSDs. Federal regulations describe three types of MSDs: Type I and Type II MSDs are treatment devices while Type III MSDs are holding tanks.

MARSH

A wetland where the dominant vegetation is non-woody plants such as grasses and sedges, as opposed to a swamp where the dominant vegetation is woody plants like trees.

METABOLISM

All chemical processes occurring within an organism, including both synthesis and breakdown of organic materials.

METALS

Metals are elements found in rocks and minerals that are naturally released to the environment by erosion, as well as generated by human activities. Certain metals, such as mercury, lead, nickel, zinc, and cadmium, are of environmental concern because they are released to the environment in excessive amounts by human activity. They are generally toxic to life at certain concentrations. Since metals are elements, they do not break down in the environment over time and can be incorporated into plant and animal tissue.

MICROLAYER, SEA-SURFACE**MICROLAYER**

The extremely thin (usually estimated as 50 microns) layer at the top of the water. Contamination of this layer is of concern because many contaminants such as oil, grease, organic toxicants, and pathogens are buoyant in seawater and therefore may concentrate at much higher concentrations in the microlayer than in the water column. The atmospheric deposition of toxicants into the microlayer is also of concern. These contaminant concentrations may pose a danger to fish eggs and other organisms that may come into contact with the water surface.

MICROORGANISMS

Microscopic organisms, (e.g., bacteria, viruses, and protozoans) that are not visible to the unaided eye. Some cause diseases in humans, animals, and plants; some are important because

they are involved in breaking down and stabilizing sewage and solid waste.

MODEL ORDINANCE

A sample ordinance which contains elements and language necessary to achieve a desired regulatory effect.

MONITOR

To systematically and repeatedly measure conditions in order to track changes. For example, dissolved oxygen in a bay might be monitored over a period of several years in order to identify trends in concentration.

MUNICIPAL DISCHARGE

Effluent from a municipal sewage treatment plant.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)

A part of the federal Clean Water Act, which requires point source dischargers to obtain discharge permits. These permits are referred to as NPDES permits and are administered by the Washington Department of Ecology.

NONPOINT SOURCE POLLUTION

Pollution that enters water from dispersed and uncontrolled sources (such as surface runoff) rather than through pipes. Nonpoint sources (e.g., forest practices, agricultural practices, on-site sewage disposal, and recreational boats) may contribute pathogens, suspended solids, and toxicants. While individual sources may seem insignificant, the cumulative effects of nonpoint source pollution can be significant.

NUTRIENTS

Essential chemicals needed by plants or animals for growth. If other physical and chemical conditions are optimal, excessive amounts of nutrients can lead to degradation of water quality by promoting excessive growth, accumulation, and subsequent decay of plants, especially algae. Some nutrients can be toxic to animals at high concentrations.

OXYGEN-DEMANDING MATERIALS

Materials such as food waste and dead plant or animal tissue that use up dissolved oxygen in the water when they are degraded through chemical or biological processes. Biochemical oxygen demand (BOD) is a measure of the amount of oxygen consumed when a substance degrades.

PARALYTIC SHELLFISH POISONING (PSP)

An illness, sometimes fatal to humans and other mammals, caused by a neurotoxin produced by a type of plankton called *Gonyaulax*. During certain times of the year and at certain locations, these organisms proliferate in "blooms" (sometimes called red tides) and can be concentrated by clams, mussels, and other bivalves. The nervous system of shellfish is unaffected. Consumption of the shellfish can cause acute illness in humans and other mammals.

PARAMETER

A quantifiable or measurable characteristic. For example, height, weight, sex, and hair color are all parameters that can be determined for humans. Water quality parameters include temperature, pH, salinity, dissolved oxygen concentration, and many others.

PATHOGEN

An agent such as a virus, bacterium, or fungus that can cause diseases in humans. Pathogens can be present in municipal, industrial, and nonpoint source discharges to the Sound.

PELAGIC

Associated with or living in the water column as opposed to the bottom or the shoreline.

PERCOLATE

To pass through a permeable substance. For instance, septic effluent and rainfall percolates through soil.

PERSISTENT

Compounds that are not readily degraded by physical, chemical, or biological processes.

PERSISTENT MARINE DEBRIS (PMD)

Plastic, glass, metal, rags, and other refuse accidentally or purposely put into the marine environment. The plastic component is often referred to as Marine Plastic Debris (MPD). Marine debris can injure or kill marine life and threatens the safety of swimmers, divers, and watercraft.

PESTICIDE

A general term used to describe chemical substances that are used to destroy or control pest organisms. Pesticides include herbicides, insecticides, algicides, fungicides, and others. Many of these substances are manufactured and are not naturally found in the environment. Others, such as pyrethrum, are natural

toxins which are extracted from plants and animals.

pH

The degree of alkalinity or acidity of a solution. A pH of 7.0 indicates neutral water while a pH of 5.5 is acid. A reading of 8.5 is alkaline or basic. The pH of water influences many of the types of chemical reactions that will occur in it. For instance, a slight decrease in pH may greatly increase the toxicity of substances such as cyanides, sulfides, and most metals. A slight increase may greatly increase the toxicity of pollutants such as ammonia.

PHOTOSYNTHESIS

The process by which plants use light energy to make simple sugars and carbohydrates from carbon dioxide and water.

PLANKTON

Small plants (phytoplankton) and animals (zooplankton) that are suspended in the water and either drift with the currents or swim weakly.

POINT SOURCE

A source of pollutants from a single point of conveyance such as a pipe. For example, the discharge pipe from a sewage treatment plant or a factory is a point source.

POLLUTANT

A contaminant that adversely alters the physical, chemical, or biological properties of the environment. The term includes pathogens, toxic metals, carcinogens, oxygen-demanding materials, and all other harmful substances. With reference to nonpoint sources, the term is sometimes used to apply to contaminants released in low concentrations from many activities which collectively degrade water quality. As defined in the federal Clean Water Act, pollutant means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.

POLYCHLORINATED BIPHENYLS (PCBs)

A group of manufactured chemicals including about 70 different but closely related compounds made up of carbon, hydrogen, and chlorine. If released to the environment they persist for long periods of time and can biomagnify in

food chains because they have no natural usage in the food web. PCBs are suspected of causing cancer in humans. PCBs are an example of an organic toxicant.

POLYCYCLIC or POLYNUCLEAR

AROMATIC HYDROCARBONS (PAHs)

A class of complex organic compounds, some of which are persistent and cancer-causing. These compounds are formed from the combustion of organic material and are ubiquitous in the environment. PAHs are commonly formed by forest fires and by the combustion of gasoline and other petroleum products. They often reach the environment through atmospheric fallout and highway runoff.

PRETREATMENT

The treatment of industrial wastewater to remove contaminants prior to discharge into municipal sewage systems.

PRIMARY TREATMENT

A wastewater treatment method that uses settling, skimming, and (usually) chlorination to remove solids, floating materials, and pathogens from wastewater. Primary treatment typically removes about 35 percent of BOD and less than half of the metals and toxic organic substances.

PRIORITY POLLUTANTS

Substances listed by EPA under the federal Clean Water Act as toxic and having priority for regulatory controls. The list currently includes metals (13), inorganic compounds (two), and a broad range of both natural and artificial organic compounds (111). The list of priority pollutants includes some substances which are not of immediate concern in Puget Sound, and it does not include all known harmful compounds.

PROTOCOL

A standardized procedure for field collection, laboratory analysis, and/or interpretation of samples. Good protocols improve the quality of data and make data from different sources comparable. The Puget Sound Estuary Program protocols were developed under contract to EPA to standardize sample collection and analysis within the Sound, allowing for comparability of data and determination of long-term environmental trends.

PUGET SOUND, WATERS OF

As defined in RCW 90.70.005, all salt waters of the state of Washington inside the international boundary line be-

tween Washington and British Columbia, and lying east of 123° 24' west longitude (east of Port Angeles).

PUGET SOUND WATER QUALITY AUTHORITY (AUTHORITY)

The state agency that is responsible for development and oversight of the Puget Sound Water Quality Management Plan.

REGULATED WETLANDS

See section W-4.1.4.

REGULATORY FRAMEWORK

A particular set of laws, rules, procedures, and agencies designed to govern a particular type of activity or solve a particular problem.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

The federal law that classifies and regulates solid and hazardous waste.

REVISED CODE OF WASHINGTON (RCW)

The compilation of the laws of the state of Washington published by the Statute Law Committee. For example, the law that created the Puget Sound Water Quality Authority is incorporated in the code as Chapter 90.70 RCW.

RIPARIAN HABITAT

Riparian ecosystems include the transitional areas between aquatic and terrestrial environments and contains all of the environmental elements that directly contribute to the structural and functional processes of a body of water.

SALINITY

A measure of the quantity of dissolved salts in water.

SALMONID

A fish of the family Salmonidae (as distinct from a salmonoid which is merely a fish that resembles a salmon). Fish in this family include salmon and trout. Most Puget Sound salmonids are anadromous.

SANITARY WASTEWATER

Wastewater which includes domestic sewage and may contain pathogens. Sanitary wastewater is not sanitary.

SECONDARY TREATMENT

A wastewater treatment method that usually involves the addition of biological treatment to the settling, skimming, and disinfection provided by primary treatment. Secondary treatment may remove up to 90 percent of BOD and

significantly more metals and toxic organics than primary treatment.

SEDIMENT

Material suspended in or settling to the bottom of a liquid, such as the sand and mud that make up much of the shorelines and bottom of Puget Sound.

SEPARATED SEWER SYSTEM

A wastewater collection and treatment system where domestic and industrial wastewater is separated from storm runoff. A separated system consists of independent sanitary wastewater and stormwater systems. The stormwater is generally discharged directly into open water and the sanitary wastewater goes to a treatment plant.

SEPTAGE

The sludge and scum material that is pumped out of a septic tank.

SHELLFISH

An aquatic animal, such as a mollusc (clams and snails) or crustacean (crabs and shrimp), having a shell or shell-like exoskeleton.

SHELLFISH CONTAMINATION

The contamination of certain bivalves — (clams, mussels, oysters) which filter water to feed and tend to collect or concentrate waterborne contaminants in their tissues.

SHORELINE DEVELOPMENT

As regulated by the Shoreline Management Act (Chapter 90.58 RCW) the construction over water or within a shoreline zone (generally 200 feet landward of the water) of structures such as buildings, piers, bulkheads, and breakwaters, including environmental alterations such as dredging and filling, or any project which interferes with public navigational rights on the surface waters.

SHORELINE MANAGEMENT ACT (SMA)

The state law (90.58 RCW) that requires local governments to develop a shoreline master program, and requires permits for water and associated land uses. Many local governments promote the protection of wetlands, habitat, and water quality through their shoreline master program.

SLUDGE, WASTEWATER TREATMENT SLUDGE

Semi-solid matter resulting from the treatment of wastewater. Some of the contaminants (especially toxic metals) that were in the wastewater remain in

the sludge after treatment. The treated wastewater can be discharged to the Sound, but the sludge must be disposed of elsewhere. Sludge is usually at least partially dried before disposal and if relatively uncontaminated may be added to soil to increase plant growth.

SOLE SOURCE AQUIFER

The single source of groundwater for human use in any one area. Areas with a sole source aquifer have no other source of groundwater; any contamination of the aquifer could contaminate the entire water supply.

SOURCE CONTROL

A practice, method, or technology that is used to reduce pollution from a source; for example, best management practices or end-of-pipe treatment.

STATE ENVIRONMENTAL POLICY ACT (SEPA)

A state law (Chapter 43.21C RCW) that requires that state agencies and local governments consider environmental factors when making decisions on activities, such as development proposals over a certain size, and comprehensive plans. As part of this process, environmental impacts are documented and opportunities for public comment are provided.

STORM DRAIN

A system of gutters, pipes, or ditches used to carry stormwater from surrounding lands to streams, lakes, or Puget Sound. In practice storm drains carry a variety of substances such as sediments, metals, bacteria, oil, and antifreeze which enter the system through runoff, deliberate dumping, or spills. This term also refers to the end of the pipe where the stormwater is discharged.

STORMWATER

Water that is generated by rainfall and is often routed into drain systems in order to prevent flooding.

SUSPENDED SOLIDS

Organic or inorganic particles that are suspended in and carried by the water. The term includes sand, mud, and clay particles as well as solids in wastewater.

TECHNOLOGY-BASED STANDARDS

Technology-based effluent standards are developed by considering the effluent quality that can be achieved using various process or treatment technologies, and the costs of those technologies, rather than basing ef-

fluent standards on the environmental effects of different loadings of pollutants.

TIMBER/FISH/WILDLIFE AGREEMENT (TFW)

An agreement between timber, fish, and wildlife interests that promotes the monitoring and protection of fish and wildlife resources as an integral component of forestry management practices.

TOTAL SUSPENDED SOLIDS (TSS)

The weight of particles that are suspended in water. Suspended solids in water reduce light penetration in the water column, can clog the gills of fish and invertebrates, and are often associated with toxic contaminants because organics and metals tend to bind to particles.

TOXIC

Poisonous, carcinogenic, or otherwise directly harmful to life.

TOXIC SUBSTANCES AND TOXICANTS

Chemical substances such as pesticides, plastics, detergents, chlorine, and industrial wastes that are poisonous, carcinogenic, or otherwise directly harmful to life.

TREATMENT

Chemical, biological, or mechanical procedures applied to an industrial or municipal discharge or to other sources of contamination to remove, reduce, or neutralize contaminants.

TRIBUTYL TIN (TBT)

An organic-metal compound used as an additive in many marine antifoulant paints used to prevent algal and barnacle growth. Tributyl tin is highly toxic to many marine organisms.

TURBIDITY

A measure of the amount of material suspended in the water. Increasing the turbidity of the water decreases the amount of light that penetrates the water column. High levels of turbidity are harmful to aquatic life.

UNCONFINED, OPEN-WATER DISPOSAL

Discharge of dredged material into an aquatic environment, usually by discharge at the surface, without restrictions or confinement of the material once it is released.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY (EPA)

The federal agency which administers many federal environmental laws. EPA Region 10, which includes Puget Sound, is headquartered in Seattle.

UPLAND MANAGEMENT AREA

A mandatory unharvested area for wildlife use and protection in a forest clearcut. These areas typically represent two percent or more of the clearcut area. This term originated from the Timber/Fish/Wildlife agreement.

VOLATILE

Can be readily vaporized at a relatively low temperature.

WASHINGTON ADMINISTRATIVE CODE (WAC)

Contains all state regulations adopted by state agencies through the rulemaking process. For example, Chapter 173-201 WAC contains water quality standards.

WASHINGTON DEPARTMENT OF ECOLOGY (ECOLOGY)

The state agency which is responsible for developing, implementing, and enforcing many environmental protection laws and policies, including the state Clean Water Act and the Shoreline Management Act. Note that the abbreviation DOE is confusing because the federal Department of Energy uses the same term. Ecology is the preferred term for referring to the Department of Ecology.

WATER COLUMN

The water in a lake, estuary, or ocean which extends from the bottom sediments to the water surface. The water column contains dissolved and particulate matter, and is the habitat for plankton, fish, and marine mammals.

WATER QUALITY ACCOUNT *see* CENTENNIAL CLEAN WATER FUND

WATER TABLE

The upper surface of groundwater or the level below which the soil is saturated with water.

WATERSHED

The geographic region within which water drains into a particular river, stream, or body of water. A watershed includes hills, lowlands, and the body of water into which the land drains. Watershed boundaries are defined by the ridges of separating watersheds.

WELLHEAD

The immediate area around the top of a well. Contamination of the aquifer may occur from surface water if the wellhead is not sealed to prevent flow down the well casing.

WETLANDS

Wetlands are defined on the first page of the Wetlands Protection Program.

ZONING

To designate by ordinances areas of land reserved and regulated for different land uses.

Appendix C.

Chapter 90.70 RCW

PUGET SOUND WATER QUALITY AUTHORITY

Sections	
90.70.001	Legislative findings—Policy.
90.70.005	Definitions.
90.70.011	Puget Sound water quality authority—Membership—Terms—Vacancies—Compensation.
90.70.025	Authority's powers.
90.70.035	Appointment of advisory committees—Duties.
90.70.045	Hiring of staff—Assignment of government employees to authority.
90.70.055	Water quality management plan—Progress reports—"State of the Sound" report—Budget and activities review.
90.70.060	Water quality management plan—Requirements—Record of public comments.
90.70.065	Puget Sound ambient monitoring program.
90.70.070	Water quality management plan—Incorporation by state and local governments—Review and report on implementation—Deviations from plan.
90.70.075	Water quality management plan—Notice in state register.
90.70.080	Adoption of rules, ordinances, and regulations.
90.70.090	Puget Sound Foundation.
90.70.901	Severability—1985 c 451.
90.70.902	Implementation and requirements of plan not affected by repeal—1990 c 115.

Reviser's note—Sunset Act application: The Puget Sound water quality authority is subject to review, termination, and possible extension under chapter 43.131 RCW, the Sunset Act. See RCW 43.131.369. RCW 90.70.001 through 90.70.060, 90.70.070, 90.70.080, and 90.70.901 are scheduled for future repeal under RCW 43.131.370.

RCW 90.70.001 Legislative findings—Policy. The legislature finds that Puget Sound and related inland marine waterways of Washington state represent a unique and unparalleled resource. A rich and varied range of marine organisms, composing an interdependent, sensitive communal ecosystem reside in these sheltered waters. Residents of this region enjoy a way of life centered around the waters of Puget Sound, featuring accessible recreational opportunities, world-class port facilities and water transportation systems, harvest of marine food resources, shoreline-oriented life styles, water-dependent industries, tourism, irreplaceable aesthetics and other activities, all of which to some degree depend upon a clean and healthy marine resource.

The legislature further finds that the consequences of careless husbanding of this resource have been dramatically illustrated in inland waterways associated with older and more extensively developed areas of the nation. Recent reports concerning degradation of water quality within this region's urban embayments raise alarming possibilities of similar despoliation of Puget Sound and other state waterways. These examples emphasize that the costs of restoration of aquatic resources, where such restoration is possible, greatly exceed the costs of responsible preservation.

The legislature declares that utilization of the Puget Sound resource carries a custodial obligation for preserving it. The people of the state have the unique opportunity to preserve this gift of nature, an understanding of the results of inattentive stewardship, the technical knowledge needed for control of degradation, and the obligation to undertake such control.

The legislature further finds that the large number of governmental entities that now affect the water quality of Puget Sound have diverse interests and limited jurisdictions which cannot adequately address the cumulative, wide-ranging impacts which contribute to the degradation of Puget Sound. It is therefore the policy of the state of Washington to create a single entity with adequate resources to develop a comprehensive plan for water quality protection in Puget Sound to be implemented by existing state and local government agencies. [1985 c 451 § 1.]

Sunset Act application: See note following chapter digest.

RCW 90.70.005 Definitions. Unless the context clearly requires otherwise, the definitions in this section apply throughout this chapter:

(1) "Authority" means the Puget Sound water quality authority.

(2) "Chair" means the presiding officer of the Puget Sound water quality authority.

(3) "Plan" means the Puget Sound water quality management plan.

(4) "Puget Sound" means all salt waters of the state of Washington inside the international boundary line between the state of Washington and the province of British Columbia, lying east of one hundred twenty-three degrees, twenty-four minutes west longitude. [1985 c 451 § 2.]

Sunset Act application: See note following chapter digest.

RCW 90.70.011 Puget Sound water quality authority—Membership—Terms—Vacancies—Compensation. (1) There is established the Puget Sound water quality authority composed of eleven members. Nine members shall be appointed by the governor and confirmed by the senate. In addition, the commissioner of public lands or the commissioner's designee and the director of ecology or the director's designee shall serve as ex officio members. Three of the members shall include a representative from the counties, a representative from the cities, and a tribal representative. The director of ecology shall be chair of the authority. In making these appointments, the governor shall seek to include representation of the variety of interested parties concerned about Puget Sound water quality. Of the appointed members, at least one shall be selected from

each of the six congressional districts surrounding Puget Sound. Members shall serve four-year terms. Of the initial members appointed to the authority, two shall serve for two years, two shall serve for three years, and two shall serve for four years. Thereafter members shall be appointed to four-year terms. Members representing cities, counties, and the tribes shall also serve four-year staggered terms, as determined by the governor. Vacancies shall be filled by appointment for the remainder of the unexpired term of the position being vacated. The executive director of the authority shall be selected by the governor and shall serve at the pleasure of the governor. The executive director shall not be a member of the authority.

(2) Members shall be compensated as provided in RCW 43.03.250. Members shall be reimbursed for travel expenses as provided in RCW 43.03.050 and 43.03.060.

(3) The executive director of the authority shall be a full-time employee responsible for the administration of all functions of the authority, including hiring and terminating staff, contracting, coordinating with the governor, the legislature, and other state and local entities, and the delegation of responsibilities as deemed appropriate. The salary of the executive director shall be fixed by the governor, subject to RCW 43.03.040.

(4) The authority shall prepare a budget and a work plan.

(5) Not more than four employees of the authority may be exempt from the provisions of chapter 41.06 RCW.

(6) The executive director and staff of the authority shall be located in the Olympia area, as space becomes available. The department of general administration shall house the authority within the department of ecology. [1990 c 115 § 2; 1985 c 451 § 3.]

Sunset Act application: See note following chapter digest.

RCW 90.70.025 Authority's powers. In order to carry out its responsibilities under this chapter, the authority may:

(1) Develop interim proposals and recommendations, before the plan is adopted, concerning the elements identified in RCW 90.70.060;

(2) Enter into, amend, and terminate contracts with individuals, corporations, or research institutions for the purposes of this chapter;

(3) Receive such gifts, grants, and endowments, in trust or otherwise, for the use and benefit of the purposes of the authority. The authority may expend the same or any income therefrom according to the terms of the gifts, grants, or endowments;

(4) Conduct studies and research relating to Puget Sound water quality;

(5) Obtain information relating to Puget Sound from other state and local agencies;

(6) Conduct appropriate public hearings and otherwise seek to broadly disseminate information concerning Puget Sound;

(7) Receive funding from other public agencies;

(8) Prepare a biennial budget request for consideration by the governor and the legislature; and

(9) Adopt rules under chapter 34.05 RCW as it deems necessary for the purposes of this chapter. [1985 c 451 § 5.]

Sunset Act application: See note following chapter digest.

Joint responsibility with department of ecology for national estuary program under section 320 of the federal clean water act: RCW 90.48.260.

RCW 90.70.035 Appointment of advisory committees—Duties. (1) The authority shall appoint one or more advisory committees to assist in the development of the plan. In making these appointments, the authority shall seek to include representation of all interested parties, including local governments, environmental and health agencies, tribal organizations, business, labor, citizens' groups such as environmental and public interest organizations, agricultural interests, recreational interests, and the fisheries and shellfish industries.

(2) The advisory committee or committees shall assist the authority to formulate policy goals and strategies, review the plan and make recommendations for its amendment to the authority, review the authority's reports, and review the authority's budget request proposals. [1985 c 451 § 6.]

Sunset Act application: See note following chapter digest.

RCW 90.70.045 Hiring of staff—Assignment of government employees to authority. (1) The executive director shall hire staff for the authority. In so doing, the executive director shall recognize the many continuing planning and research activities concerning Puget Sound water quality and shall seek to acquire competent and knowledgeable staff from state, federal, and local government agencies and other agencies that are currently involved in these activities.

(2) As deemed appropriate, the executive director may request the state departments of ecology, community development, fisheries, wildlife, agriculture, natural resources, parks and recreation, and health to each assign at least one employee to the authority. The executive director shall enter into an interagency agreement with agencies assigning employees to the authority. Such agreement shall provide for reimbursement, by the authority to the assigning agency, of all work-related expenditures associated with the assignment of the employees. During the term of their assignment, the executive director has full authority and responsibility for the activities of these employees.

(3) The executive director shall seek assignment of appropriate federal and local government employees under available means. [1990 c 115 § 3; 1988 c 36 § 72; 1985 c 451 § 7.]

Sunset Act application: See note following chapter digest.

RCW 90.70.055 Water quality management plan—Progress reports—"State of the Sound" report—Budget and activities review. The authority shall:

(1) Prepare and adopt a comprehensive Puget Sound water quality management plan, as defined in RCW 90.70.060. In preparing the plan and any substantial revisions to the plan, the authority shall consult with its advisory committee or committees and appropriate federal, state, and local agencies. The authority shall also solicit extensive participation by the public by whatever means it finds appropriate, including public hearings throughout communities bordering or near Puget Sound, dissemination of information through the news media, public notices, and mailing lists, and the organization of workshops, conferences, and seminars;

(2) During the plan's initial development and any subsequent revisions, submit annual progress reports on plan revisions and implementation to the governor and the legislature.

(3) Submit the plan to the governor and the legislature no later than January 1, 1987. The authority shall review the plan at least every four years and revise the plan, as deemed appropriate, and shall submit the plan by July 1, 1994, and every four years thereafter;

(4) Prepare a biennial "state of the Sound" report and submit such report to the governor, the legislature, and the state agencies and local governments identified in the plan. Copies of the report shall be made available to the public. The report shall describe the current condition of water quality and related resources in Puget Sound and shall include:

(a) The status and condition of the resources of Puget Sound, including the results of ecological monitoring, including an assessment of the economic value of Puget Sound;

(b) Current and foreseeable trends in water quality of Puget Sound and the management of its resources;

(c) Review of significant public and private activities affecting Puget Sound and an assessment of whether such activities are consistent with the plan; and

(d) Recommendations to the governor, the legislature, and appropriate state and local agencies for actions needed to remedy any deficiencies in current policies, plans, programs, or activities relating to the water quality of Puget Sound, and recommendations concerning changes necessary to protect and improve Puget Sound water quality; and

(5) Review the Puget Sound related budgets and regulatory and enforcement activities of state agencies with responsibilities for water quality and related resources in Puget Sound. [1990 c 115 § 4; 1985 c 451 § 4.]

Sunset Act application: See note following chapter digest.

RCW 90.70.060 Water quality management plan—Requirements—Record of public comments.

The plan adopted by the authority shall be a positive document prescribing the needed actions for the maintenance and enhancement of Puget Sound water quality. The plan shall address all the waters of Puget Sound, the Strait of Juan de Fuca, and, to the extent that they affect water quality in Puget Sound, all waters flowing into Puget Sound, and adjacent lands. The authority may define specific geographic boundaries within which

the plan applies. The plan shall coordinate and incorporate existing planning and research efforts of state agencies and local government related to Puget Sound, and shall avoid duplication of existing efforts. The plan shall include:

(1) A statement of the goals and objectives for long and short-term management of the water quality of Puget Sound;

(2) A resource assessment which identifies critically sensitive areas, key characteristics, and other factors which lead to an understanding of Puget Sound as an ecosystem;

(3) Demographic information and assessment as relates to future water quality impacts on Puget Sound;

(4) An identification and legal analysis of all existing laws governing actions of government entities which may affect water quality management of Puget Sound, the interrelationships of those laws, and the effect of those laws on implementation of the provisions of the plan;

(5) Review and assessment of existing criteria and guidelines for governmental activities affecting Puget Sound's resources, including shoreline resources, aquatic resources, associated watersheds, recreational resources and commercial resources;

(6) Identification of research needs and priorities;

(7) Recommendations for guidelines, standards, and timetables for protection and clean-up activities and the establishment of priorities for major clean-up investments and nonpoint source management, and the projected costs of such priorities;

(8) A procedure assuring local government initiated planning for Puget Sound water quality protection;

(9) Ways to better coordinate federal, state, and local planning and management activities affecting Puget Sound's water quality;

(10) Public involvement strategies, including household hazardous waste education, community clean-up efforts, and public participation in developing and implementing the plan;

(11) Recommendations on protecting, preserving and, where possible, restoring wetlands and wildlife habitat and shellfish beds throughout Puget Sound;

(12) Recommendations for a comprehensive water quality and sediment monitoring program;

(13) Analysis of current industrial pretreatment programs for toxic wastes, and procedures and enforcement measures needed to enhance them;

(14) Recommendations for a program of dredge spoil disposal, including interim measures for disposal and storage of dredge spoil material from or into Puget Sound;

(15) Definition of major public actions subject to review and comment by the authority because of a significant impact on Puget Sound water quality and related resources, and development of criteria for review thereof;

(16) Recommendations for implementation mechanisms to be used by state and local government agencies;

(17) Standards and procedures for reporting progress by state and local governments in the implementation of the plan;

(18) An analysis of resource requirements and funding mechanisms for updating of the plan and plan implementation; and

(19) Legislation needed to assure plan implementation.

The authority shall circulate and receive comments on drafts of the plan mandated herein, and keep a record of all relevant comments made at public hearings and in writing. These records should be made easily available to interested persons.

As part of the plan, the authority shall prepare a strategy for implementing the plan that includes, but is not limited to: (a) Setting priorities for implementation of plan elements to facilitate executive and legislative decision making; (b) assessment of the capabilities and constraints, both internal and external to state and local government, that may affect plan implementation; and (c) an analysis of the strategic options in light of the resources available to the state. In developing this strategy, the authority shall consult and coordinate with other related environmental planning efforts. [1990 c 115 § 5; 1989 c 11 § 31; 1985 c 451 § 8.]

Sunset Act application: See note following chapter digest.

Severability—1989 c 11: See note following RCW 9A.56.220.

RCW 90.70.065 Puget Sound ambient monitoring program. (1) In addition to other powers and duties specified in this chapter, the authority shall ensure implementation of the Puget Sound ambient monitoring program established in the plan under RCW 90.70.060(12). The program shall:

(a) Develop a baseline and examine differences among areas of Puget Sound, for environmental conditions, natural resources, and contaminants in seafood, against which future changes can be measured;

(b) Take measurements relating to specific program elements identified in the plan;

(c) Measure the progress of the ambient monitoring programs implemented under the plan;

(d) Provide a permanent record of significant natural and human-caused changes in key environmental indicators in Puget Sound; and

(e) Help support research on Puget Sound.

(2) To ensure proper coordination of the ambient monitoring program, the authority may establish an interagency coordinating committee consisting of representatives from the departments of ecology, fisheries, natural resources, wildlife, and health, and such federal, local, tribal, and other organizations as are necessary to implement the program.

(3) Each state agency with responsibilities for implementing the Puget Sound ambient monitoring program, as specified in the plan, shall participate in the program. [1990 c 115 § 9.]

RCW 90.70.070 Water quality management plan—Incorporation by state and local governments—Review and report on implementation—Deviations from plan. (1) In conducting planning, regulatory, and appeals actions, the state agencies and local governments identified in the plan must evaluate,

and incorporate as applicable, subject to the availability of appropriated funds or other funding sources, the provisions of the plan, including any guidelines, standards, and timetables contained in the plan.

(2) The authority shall review the progress of state agencies and local governments regarding the timely implementation of the plan. Where prescribed actions have not been accomplished in accordance with the plan, the responsible state agencies and local governments shall, at the request of the authority, submit written explanations for the shortfalls, together with their proposed remedies, to the authority.

The results of the review and a description of the actions necessary to comply with the plan shall be included in the biennial state of the Sound report.

(3) The state agencies and local governments identified in the plan shall review their activities biennially and document their consistency with the plan. They shall submit written reports or updates of their findings to the authority.

(4) The authority shall review the major actions affected by the plan being considered by the state agencies and local governments and shall comment in a timely manner regarding consistency with the plan and may participate in administrative and subsequent judicial proceedings with respect to such actions. Any deviations from the plan, identified by the authority, shall be transmitted in writing by the authority to the responsible state agency or local government. [1990 c 115 § 6; 1985 c 451 § 9.]

Sunset Act application: See note following chapter digest.

RCW 90.70.075 Water quality management plan—Notice in state register. (1) At least twenty days before public hearings commence regarding a proposal to adopt or revise the plan or any portion of it, the authority shall cause to be published in the state register the following information:

(a) A summary of the proposal;

(b) The personnel, with their office location and telephone numbers, who are responsible for the drafting of the proposal; and

(c) When, where, and how persons may present their views on the proposal.

(2) The authority may not adopt any portion of the plan that is substantially different from the version of the plan that was summarized in the state register under subsection (1) of this section, unless a supplemental notice is published in the state register reopening public comment on the proposed variance. The following factors shall be considered in determining whether an adopted portion of the plan is substantially different from the summarized version:

(a) The extent to which a reasonable person affected by the adopted plan would have understood that the summarized version would affect his or her interests;

(b) The extent to which the subject of the adopted plan or the issues determined in it are substantially different from the subject or issues involved in the summarized version; and

(c) The extent to which the effects of the adopted plan differ from the effects of the summarized version. [1990 c 115 § 10.]

RCW 90.70.080 Adoption of rules, ordinances, and regulations. (1) To implement this chapter, state agencies are authorized to adopt rules that are applicable to actions and activities on a less than state-wide geographic basis. State agencies are encouraged to adopt rules that protect Puget Sound water quality before the adoption of the plan by the authority.

(2) A rule to implement an element of the plan that applies on a less than state-wide basis shall contain a statement defining the geographic area to which it applies. In determining whether to adopt rules on a state-wide or less than state-wide basis, state agencies shall consider at least the following factors:

- (a) Number and location of primary affected persons;
- (b) Geographical distribution of the actions and activities;
- (c) Equity among regulated and nonregulated persons;
- (d) Difficulty and practicality of implementation, including the effects on existing agency programs;
- (e) Expected environmental benefits;
- (f) Availability of information related to the actions and activities; and
- (g) Requirements of other state or federal laws, rules, and policies.

When a state agency proposes to adopt a rule applicable beyond the Puget Sound area, and that rule was originally proposed to implement an element of the plan, the state agency shall ensure that early and meaningful participation by interested members of the public is provided from all geographic areas to which the rule will be applicable.

(3) To implement this chapter, counties, cities, and towns are authorized to adopt ordinances, rules, and regulations that are applicable on less than a county-wide, city-wide, or town-wide basis. Counties, cities, and towns are encouraged to adopt ordinances, rules, and regulations that protect Puget Sound water quality before the adoption of the plan by the authority. [1990 c 115 § 7; 1985 c 451 § 10.]

Sunset Act application: See note following chapter digest.

RCW 90.70.090 Puget Sound Foundation. In addition to other powers and duties specified in this chapter, the authority may form a public nonprofit corporation in the same manner as a private nonprofit corporation is formed under chapter 24.03 RCW, the Washington nonprofit corporation act. The public corporation shall be an instrumentality of the state and have all the powers and be subject to the same restrictions as are permitted or prescribed to private nonprofit corporations but shall exercise these powers only for carrying out the purposes of this section. However, the public nonprofit corporation shall not borrow money or incur any indebtedness. The public corporation shall be known as the Puget Sound Foundation. The purposes of the foundation shall be to:

(1) Receive, disburse, and administer gifts, grants, endowments, or other funds from any source that support a comprehensive and coordinated program of research and education activities connected with Puget Sound water quality, consistent with the purposes of this chapter;

(2) Promote the coordination and support of research and education activities that address the cumulative effects of decisions on the Puget Sound ecosystem;

(3) Assist in making the results of research available and useful to the decision-making process; and

(4) Host an annual meeting, to be known as the Puget Sound summit, assembling state agencies, local governments, tribes, the public, and private businesses for the purposes of improving understanding about the obstacles to plan implementation, enhancing cooperation, and expediting Puget Sound cleanup. [1990 c 115 § 8.]

RCW 90.70.901 Severability—1985 c 451. If any provision of this act or its application to any person or circumstance is held invalid, the remainder of the act or the application of the provision to other persons or circumstances is not affected. [1985 c 451 § 14.]

Sunset Act application: See note following chapter digest.

RCW 90.70.902 Implementation and requirements of plan not affected by repeal—1990 c 115. Nothing in RCW 43.131.370 shall affect the implementation and requirements of the Puget Sound water quality management plan existing on June 30, 1995, or such other effective date of repeal of the laws referenced in RCW 43.131.370. The implementation of the plan on and after that date shall be the responsibility of such entities as are provided by the legislature. [1990 c 115 § 13.]

Appendix D.
The Clean Water Act
as Amended by
The Water Quality Act of 1987
Public Law 100-4
Section 320

March 1988

SEC. 320. NATIONAL ESTUARY PROGRAM.

(a) MANAGEMENT CONFERENCE.—

(1) NOMINATION OF ESTUARIES.—*The Governor of any State may nominate to the Administrator an estuary lying in whole or in part within the State as an estuary of national significance and request a management conference to develop a comprehensive management plan for the estuary. The nomination shall document the need for the conference, the likelihood of success, and information relating to the factors in paragraph (2).*

(2) CONVENING OF CONFERENCE.—

(A) IN GENERAL.—*In any case where the Administrator determines, on his own initiative or upon nomination of a State under paragraph (1), that the attainment or maintenance of that water quality in an estuary which assures protection of public water supplies and the protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife, and allows recreational activities, in and on the water, requires the control of point and non-point sources of pollution to supplement existing controls of pollution in more than one State, the Administrator shall select such estuary and convene a management conference.*

(B) PRIORITY CONSIDERATION.—*The Administrator shall give priority consideration under this section to Long Island Sound, New York and Connecticut; Narragansett Bay, Rhode Island; Buzzards Bay, Massachusetts; Puget Sound, Washington; New York-New Jersey Harbor, New York and New Jersey; Delaware Bay, Delaware and New Jersey; Delaware Inland Bays, Delaware; Albemarle Sound, North Carolina; Sarasota Bay, Florida; San Francisco Bay, California; and Galveston Bay, Texas.*

(3) BOUNDARY DISPUTE EXCEPTION.—*In any case in which a boundary between two States passes through an estuary and such boundary is disputed and is the subject of an action in any court, the Administrator shall not convene a management*

conference with respect to such estuary before a final adjudication has been made of such dispute.

(b) **PURPOSES OF CONFERENCE.**—The purposes of any management conference convened with respect to an estuary under this subsection shall be to—

(1) assess trends in water quality, natural resources, and uses of the estuary;

(2) collect, characterize, and assess data on toxics, nutrients, and natural resources within the estuarine zone to identify the causes of environmental problems;

(3) develop the relationship between the in-place loads and point and nonpoint loadings of pollutants to the estuarine zone and the potential uses of the zone, water quality, and natural resources;

(4) develop a comprehensive conservation and management plan that recommends priority corrective actions and compliance schedules addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected;

(5) develop plans for the coordinated implementation of the plan by the States as well as Federal and local agencies participating in the conference;

(6) monitor the effectiveness of actions taken pursuant to the plan; and

(7) review all Federal financial assistance programs and Federal development projects in accordance with the requirements of Executive Order 12372, as in effect on September 17, 1983, to determine whether such assistance program or project would be consistent with and further the purposes and objectives of the plan prepared under this section.

For purposes of paragraph (7), such programs and projects shall not be limited to the assistance programs and development projects subject to Executive Order 12372, but may include any programs listed in the most recent Catalog of Federal Domestic Assistance which may have an effect on the purposes and objectives of the plan developed under this section.

(c) **MEMBERS OF CONFERENCE.**—The members of a management conference convened under this section shall include, at a minimum, the Administrator and representatives of—

(1) each State and foreign nation located in whole or in part in the estuarine zone of the estuary for which the conference is convened;

(2) international, interstate, or regional agencies or entities having jurisdiction over all or a significant part of the estuary;

(3) each interested Federal agency, as determined appropriate by the Administrator;

(4) local governments having jurisdiction over any land or water within the estuarine zone, as determined appropriate by the Administrator; and

(5) affected industries, public and private educational institutions, and the general public, as determined appropriate by the Administrator.

(d) **UTILIZATION OF EXISTING DATA.**—In developing a conservation and management plan under this section, the management conference shall survey and utilize existing reports, data, and studies relating to the estuary that have been developed by or made available to Federal, interstate, State, and local agencies.

(e) **PERIOD OF CONFERENCE.**—A management conference convened under this section shall be convened for a period not to exceed 5 years. Such conference may be extended by the Administrator, and if terminated after the initial period, may be reconvened by the Administrator at any time thereafter, as may be necessary to meet the requirements of this section.

(f) **APPROVAL AND IMPLEMENTATION OF PLANS.**—

(1) **APPROVAL.**—Not later than 120 days after the completion of a conservation and management plan and after providing for public review and comment, the Administrator shall approve such plan if the plan meets the requirements of this section and the affected Governor or Governors concur.

(2) **IMPLEMENTATION.**—Upon approval of a conservation and management plan under this section, such plan shall be implemented. Funds authorized to be appropriated under titles II and VI and section 319 of this Act may be used in accordance with the applicable requirements of this Act to assist States with the implementation of such plan.

(g) **GRANTS.**—

(1) **RECIPIENTS.**—The Administrator is authorized to make grants to State, interstate, and regional water pollution control agencies and entities, State coastal zone management agencies, interstate agencies, other public or nonprofit private agencies, institutions, organizations, and individuals.

(2) **PURPOSES.**—Grants under this subsection shall be made to pay for assisting research, surveys, studies, and modeling and other technical work necessary for the development of a conservation and management plan under this section.

(3) **FEDERAL SHARE.**—The amount of grants to any person (including a State, interstate, or regional agency or entity) under this subsection for a fiscal year shall not exceed 75 percent of the costs of such research, survey, studies, and work and shall be made on condition that the non-Federal share of such costs are provided from non-Federal sources.

(h) **GRANT REPORTING.**—Any person (including a State, interstate, or regional agency or entity) that receives a grant under subsection (g) shall report to the Administrator not later than 18 months after receipt of such grant and biennially thereafter on the progress being made under this section.

(i) **AUTHORIZATION OF APPROPRIATIONS.**—There are authorized to be appropriated to the Administrator not to exceed \$12,000,000 per fiscal year for each of fiscal years 1987, 1988, 1989, 1990, and 1991 for—

(1) expenses related to the administration of management conferences under this section, not to exceed 10 percent of the amount appropriated under this subsection;

- (2) making grants under subsection (g); and
- (3) monitoring the implementation of a conservation and management plan by the management conference or by the Administrator, in any case in which the conference has been terminated.

The Administrator shall provide up to \$5,000,000 per fiscal year of the sums authorized to be appropriated under this subsection to the Administrator of the National Oceanic and Atmospheric Administration to carry out subsection (j).

(j) RESEARCH.—

(1) PROGRAMS.—In order to determine the need to convene a management conference under this section or at the request of such a management conference, the Administrator shall coordinate and implement, through the National Marine Pollution Program Office and the National Marine Fisheries Service of the National Oceanic and Atmospheric Administration, as appropriate, for one or more estuarine zones—

(A) a long-term program of trend assessment monitoring measuring variations in pollutant concentrations, marine ecology, and other physical or biological environmental parameters which may affect estuarine zones, to provide the Administrator the capacity to determine the potential and actual effects of alternative management strategies and measures;

(B) a program of ecosystem assessment assisting in the development of (i) baseline studies which determine the state of estuarine zones and the effects of natural and anthropogenic changes, and (ii) predictive models capable of translating information on specific discharges or general pollutant loadings within estuarine zones into a set of probable effects on such zones;

(C) a comprehensive water quality sampling program for the continuous monitoring of nutrients, chlorine, acid precipitation dissolved oxygen, and potentially toxic pollutants (including organic chemicals and metals) in estuarine zones, after consultation with interested State, local, interstate, or international agencies and review and analysis of all environmental sampling data presently collected from estuarine zones; and

(D) a program of research to identify the movements of nutrients, sediments and pollutants through estuarine zones and the impact of nutrients, sediments, and pollutants on water quality, the ecosystem, and designated or potential uses of the estuarine zones.

(2) REPORTS.—The Administrator, in cooperation with the Administrator of the National Oceanic and Atmospheric Administration, shall submit to the Congress no less often than biennially a comprehensive report on the activities authorized under this subsection including—

(A) a listing of priority monitoring and research needs;

(B) an assessment of the state and health of the Nation's estuarine zones, to the extent evaluated under this subsection;

(C) a discussion of pollution problems and trends in pollutant concentrations with a direct or indirect effect on water quality, the ecosystem, and designated or potential uses of each estuarine zone, to the extent evaluated under this subsection; and

(D) an evaluation of pollution abatement activities and management measures so far implemented to determine the degree of improvement toward the objectives expressed in subsection (b)(4) of this section.

(k) **DEFINITIONS.**—For purposes of this section, the terms "estuary" and "estuarine zone" have the meanings such terms have in section 104(n)(4) of this Act, except that the term "estuarine zone" shall also include associated aquatic ecosystems and those portions of tributaries draining into the estuary up to the historic height of migration of anadromous fish or the historic head of tidal influence, whichever is higher.

Appendix E.

Summary of Chapter 400-12 WAC

Local Planning and Management of Nonpoint Source Pollution

INTRODUCTION

The Puget Sound Water Quality Authority, in cooperation with the Department of Ecology, has adopted a rule to provide direction for local watershed planning and management. Watershed planning is an important component of the Nonpoint Source Pollution program in the Puget Sound Water Quality Management Plan. Under the program, committees in each of the 12 Puget Sound counties are identifying and ranking local watersheds. Watershed management committees will develop action plans to prevent and reduce nonpoint source pollution in top-ranked watersheds. Sources addressed may include stormwater runoff, on-site sewage disposal (septic) systems, agricultural practices, and other sources.

Additional information and copies of the full text of the rule (Chapter 400-12 WAC, Local Planning and Management of Nonpoint Source Pollution) may be obtained by calling the Authority office at (206) 464-7320 or 1-800-54-SOUND.

PUBLIC INVOLVEMENT

The public involvement provisions of the rule require meaningful and substantive participation by the general public and affected parties. The rule requires adequate opportunities for public comment throughout the watershed ranking and action planning processes. This includes public meetings, consultations with interested and affected parties, and other means of soliciting public comment.

WATERSHED RANKING PROCESS

A watershed ranking committee has been formed in each county, in accordance with the Puget Sound plan and the nonpoint rule, to establish a priority order of the county's watersheds that most need preventive and/or corrective actions to manage nonpoint source pollution.

Watershed Ranking Committee Formation

The lead agency (usually a county) invites other local government entities, special purpose districts, and tribes to appoint representatives to the ranking committee. Representatives of the general public and "affected parties" (those who are either negatively affected by nonpoint source pollution or associated with nonpoint pollution sources) are included on the committee or on an advisory committee.

Watershed Ranking Process

The ranking committee defines watershed and subwatershed boundaries. Using criteria in the Puget Sound plan and the Puget Sound Cooperative River Basin Study,¹ the committee obtains information on water quality, beneficial uses, and biological condition of the county's watersheds.

The committee develops a proposed watershed ranking based on the criteria and/or comment at public meetings or workshops and holds a public hearing on the proposed ranking. The lead agency submits the final ranking to Ecology. As funding from the Centennial Clean Water Fund (cigarette tax) becomes available, action plans will be developed for watersheds in the order in which they are ranked locally.

The lead agency will convene a ranking committee every five years to revise the ranking based on new information.

WATERSHED ACTION PLAN PROCESS

Watershed management committees will be formed in priority watersheds to prepare coordinated action plans to prevent and abate nonpoint sources of pollution. The management committee will have 18 months to prepare an action plan after the schedule and work plan are determined (up to 24 months in large or complex watersheds).

Watershed Management Committee Formation

The lead agency (initially the county unless the watersheds are entirely within city or tribal boundaries) invites local governments, conservation districts, and tribes to appoint representatives to form an initial committee. The lead agency and invited entities consult with affected parties in determining the size and structure of the full committee.

Representatives of planning and implementing entities are included on the committee, and representatives of the general public and affected parties are included on the committee or on an advisory committee. The lead agency convenes the committee and the committee determines a schedule and work plan within 90 days of the effective date of its Ecology grant agreement.

Phase 1: Identification of Nonpoint Source Pollution Problems and Action Plan Policies

The committee conducts a water quality assessment and a characterization of the watershed. The purpose of these two tasks is to identify nonpoint sources and evaluate water

¹ This is a team of technical assistance staff from the U.S.D.A. Soil Conservation Service, U.S. Forest Service, and the Washington Department of Fisheries.

quality, beneficial uses, land use patterns, and the physical and biological conditions in the watershed.

The committee identifies the categories of nonpoint source pollution and develops a statement of goals and objectives for preventing and correcting nonpoint sources.

Phase 2: Draft Plan Development

The committee develops source control programs for the nonpoint source problems it has identified and prepares an implementation plan for the proposed source control programs (see descriptions of source control programs below).

Phase 3: Adoption of Action Plan

The watershed management committee forwards the draft action plan and accompanying documentation to the lead agency. Entities involved in developing and implementing the action plan and Ecology review the draft action plan. The committee revises the action plan after considering comments from reviewers and holds a joint public hearing with implementing entities.

Each implementing entity submits a statement to the watershed management committee indicating its intent to implement the plan, or a statement of nonconcurrence that recommends revisions to the plan. The committee attempts to resolve statements of nonconcurrence, prepares final revisions to the action plan, and approves it.

The final revised action plan is forwarded to the lead agency for review and submittal to Ecology. The lead agency proposes solutions to unresolved statements of nonconcurrence and submits them to Ecology as part of the final action plan. Ecology notifies the lead agency of its decision on final approval of the action plan, and the lead agency notifies all appropriate federal and state agencies, planning and implementing entities, and affected parties of Ecology's decision.

The lead implementing agency coordinates implementing entities and provides regular progress reports on implementation to Ecology. Ecology conducts an ongoing review of compliance with the action plan to ensure consistent and adequate implementation.

SOURCE CONTROLS

Watershed management committees are to develop source control programs for significant and/or potential sources of nonpoint pollution. The goal of source control programs is to minimize water pollution, protect beneficial uses, and enhance water quality in the watershed. If the watershed management committee determines that a particular source is not significant (or potentially significant), no source control program is required.

Agricultural Practices

Use of best management practices (BMPs) in approved farm plans (such as "208" water quality management plans) is the recommended approach. Programs will also include education, incentives, and a compliance element. Regulations may be considered when the severity of problems and

the number of individual sources make it ineffective to rely on voluntary programs alone. (Farms implementing approved farm plans are exempt from further regulations unless water quality violations occur.)

On-Site Sewage Disposal

Control programs should focus on areas with the greatest potential for on-site system failure, although areas of low or moderate risk must also be identified. Provisions for regular maintenance of on-site systems in all high-risk areas are required.

Education programs will be designed for users and servicers of on-site systems about proper siting, operation, and maintenance. Remedial programs may require repair, replacement, and the use of alternative systems such as mounds and sand filters.

Stormwater and Erosion

Emphasis is on controlling stormwater quality and quantity at the source before it is discharged into public drainage systems or natural water bodies. Control strategies will evaluate existing efforts at controlling stormwater, identify significant stormwater and erosion problems, and identify monitoring needs. Corrective and preventive measures should be planned, including public education, training of field staff, maintenance of stormwater systems, and use of best management practices for stormwater and erosion control.

Forest Practices—Coordination with Timber/Fish/Wildlife

Watershed action plans should be coordinated with the T/F/W process where forest practice activities affect water quality. Procedures must be developed for all jurisdictions to exercise their authorities under the state Forest Practices Program in a consistent fashion.

Marinas and Boats—Coordination with State Program

The watershed management committee will develop a source control program for marinas and boats in coordination with the State Parks and Recreation Commission and Department of Social and Health Services. Education programs will be developed informing marina operators and the boating public about pollution from boating activities and ways to prevent it. The watershed management committee may require shoreside sewage disposal facilities at marinas and facilities for disposal of boating-related fuels, paints, and solvents.

Other Sources

Watershed action plans should also address correction or prevention of pollution from other sources such as pesticides, landfills, mines, sand/gravel pits, septage, and contaminated sites.

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