Development of an Aquatic Management Plan for Elliott Bay and the Duwamish Estuary: A Study

Prepared for

Puget Sound Water Quality Authority
Olympia, Washington 98504-0900

June 1993

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
Consent decree	*United States et. al. v. City of Seattle and the Municipality of Metropolitan Seattle*, Case 90-395 (W.D. Washington)
the Co-op	Elliott Bay Cooperative Study
Corps	U.S. Army Corps of Engineers
CSO	combined sewer overflow
DARP	Damage Assessment and Restoration Program (NOAA)
DNR	Washington Department of Natural Resources
Duwamish Estuary	Includes the length of the East and West Waterways and the Duwamish Waterway from Puget Sound to the head of navigation (Turning Basin No. 3)
Ecology	Washington Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
Metro	Municipality of Metropolitan Seattle
NOAA	National Oceanic and Atmospheric Administration
the Panel	The Elliott Bay/Duwamish Restoration Program Panel
PSDDA	Puget Sound Dredged Disposal Analysis
PSWQA	Puget Sound Water Quality Authority
SEPA	State Environmental Policy Act
Suquamish Tribe	The Suquamish Tribe of the Port Madison Indian Reservation
WDF	Washington Department of Fisheries

FOREWORD

Issue

To assure that Elliott Bay and the Duwamish Estuary continue to support multiple uses and activities over the long term, federal, state, and local agencies and tribal governments must manage human activities in a manner that will minimize conflicts among activities.

Proposal

The Washington Department of Natural Resources (DNR) proposed establishing the Elliott Bay cooperative study (the Co-op) to provide agencies, governments, and other organizations the opportunity to work together to identify and minimize potential conflicts among activities. In addition, this cooperative setting provided the participants with the opportunity to develop a generic conflict resolution planning method that might be used in other urban bays in Washington.

Participants

Co-op participants included representatives from the Elliott Bay/Duwamish Restoration Program Panel (the Panel), including the City of Seattle, the Municipality of Metropolitan Seattle (Metro), the Washington Department of Ecology (Ecology), the Muckleshoot Indian Tribe, the Suquamish Tribe of the Port Madison Indian Reservation (the Suquamish Tribe), the National Oceanic and Atmospheric Administration (NOAA), and the U.S. Fish and Wildlife Service (FWS); non-Panel agencies and organizations, including the City of Tukwila, the Port of Seattle, King County, the Puget Sound Water Quality Authority (PSWQA), the Washington Department of Fisheries (WDF), DNR, the Washington Department of Wildlife, the U.S. Army Corps of Engineers (Corps), the U.S. Environmental Protection Agency (EPA), and the U.S. Coast Guard; and the Boeing Company (Boeing was involved because of their extensive ownership on the Duwamish River, and they were specifically invited by the Panel to participate in the Panel's technical working group discussions).

Sponsors

The funding necessary to facilitate and record the Co-op meetings and to prepare this summary document was provided by DNR, the Panel, NOAA, EPA, and the Port of Seattle. PSWQA provided administrative support to complete these tasks.

Report Organization

Following the Executive Summary, Chapter I provides some general introductory and background information related to the formation of the Co-op and the Co-op's activities. Chapter II discusses the Co-op's development of a generic model process that may be used in conflict resolution and management planning activities in other locations. Chapter III discusses the major steps taken and products developed by the Co-op in the application of this model process in general and to Elliott Bay and the Duwamish Estuary. Chapter IV provides an analysis of the strengths and weaknesses of the model process in general and as applied by the Co-op to Elliott Bay and the Duwamish Estuary. Chapter V then sets forth recommendation for future Co-op activities.

Appendix A provides a list of the Co-op agency and organization representatives. Appendix B contains the summaries of agency policies and authorities. Appendix C describes the Elliott Bay management units defined by the Co-op. Appendix D contains the meeting minutes (available from DNR).

Report Uses

This document is available to interested agencies and individuals from DNR.

The information in this document does not represent new policy and is not binding upon the Co-op participants or members of the general public. The information provided herein is intended to be used by Co-op participants as a coordination tool and by the participants and the general public as a reference document that may be consulted when considering future actions in Elliott Bay and the Duwamish Estuary or when conducting other regional conflict resolution activities.

Because no formal policy or plan was developed, Co-op participants determined that it would be inappropriate and unnecessary to subject the Co-op results to the NEPA/State Environmental Policy Act (SEPA) public comment and review process. The level of public involvement will

increase as part of the development of a formal policy, if such a policy is developed in the future.

Acknowledgments

A subcommittee comprising representatives from the Port of Seattle (Doug Hotchkiss), the City of Tukwila (Phil Fraser), the Suquamish Tribe (Margaret Duncan), and DNR (Dave Jamison) met with Wendy Graham of PTI Environmental Services to develop the outline for this report. Margaret Duncan was the primary author of the analysis section. Wendy Graham prepared the detailed synopsis of meeting discussions and was the primary author of this report.

EXECUTIVE SUMMARY

BACKGROUND

Elliott Bay and the Duwamish Estuary support a variety of human activities and provide habitat for numerous species of fish and wildlife. In both the bay and estuary, the shoreline has been greatly altered to support commercial and recreational vessel navigation; commercial, treaty, and recreational fishing; and retail and industrial operations. The bay and estuary are also relied on to receive storm water, waste water, and sewage discharges from industrial and residential sources. These and other human activities and uses have adversely impacted resources in these water bodies by degrading water quality, contaminating sediments, and filling nearshore habitat areas. Efforts are now underway to decrease ongoing pollution by controlling sources and to restore impacted habitat by remediating contaminated sediments and implementing specific habitat creation projects.

The challenge to state and federal proprietary and regulatory agencies, and local and tribal governments, is to manage the bay and estuary in a manner that will allow multiple uses and activities with as little conflict as possible while preserving and restoring environmental quality and resources. This challenge can only be met by taking a coordinated, long-term management approach involving conflict identification and resolution, rather than managing each use or activity in isolation of all others and without consideration of future needs and cumulative impacts.

Several recent events, including the following, have highlighted the need for a comprehensive management approach involving conflict identification and resolution in Elliott Bay and the Duwamish Estuary.

The consent decree (*United States et. al. v. City of Seattle and the Municipality of Metropolitan Seattle*, Case 90-395 [W.D. Washington]) settling the natural resource damages lawsuit between the United States et al. and the City of Seattle and Metro provides funds for source control, sediment remediation, and habitat development projects in Elliott Bay and the Duwamish Estuary. Decisions about how best to use the settlement money may affect or conflict with the management concerns of other agencies that are not party to the consent decree. Thus, to assure the long-term success of source control, sediment remediation, and habitat development projects, parties to the consent decree need to be aware of the concerns and priorities of all agencies when deciding how best to spend the consent decree money.

Cleanup of the Harbor Island Superfund site (and potentially the Wyckoff site) and the Port of Seattle's southwest harbor area will include remediation of contaminated sediments. Sediment remediation raises important management concerns regarding appropriate remedy selection (e.g., requiring consideration of navigation, commerce, and habitat needs) and the availability of a disposal site.

Several pilot habitat restoration projects are being implemented in the Duwamish Estuary under the Coastal America process. These projects may also affect or conflict with the management concerns of agencies not directly involved. Conversely, these projects will likely provide important lessons in habitat restoration that benefit other parties.

NOAA's Damage Assessment and Restoration Program (DARP) Seattle office is interested in developing a long-term habitat restoration planning process that takes a comprehensive, bay-wide approach. NOAA recognizes that issues such as land use and sediment remediation plans may affect restoration plans and, therefore, wants to coordinate the restoration planning activities with these other activities.

CO-OP PARTICIPANTS

Co-op participants included representatives from the Panel (including the City of Seattle, Metro, Ecology, the Muckleshoot Indian Tribe, the Suquamish Tribe, NOAA, and FWS); non-Panel agencies and organizations (including the City of Tukwila, the Port of Seattle, King County, PSWQA, WDF, DNR, the Washington Department of Wildlife, the Corps, EPA, and the U.S. Coast Guard); and the Boeing Company.

A list of the representatives from each of these agencies and organizations, including addresses, telephone numbers, and fax numbers, is included in Appendix A.

SPONSORS

The funding necessary to facilitate and record the Co-op meetings and to prepare this summary document was provided by DNR, the Panel, NOAA, EPA, and the Port of Seattle. PSWQA provided administrative support to complete these tasks.

PROPOSAL AND GOALS

DNR manages state-owned aquatic lands, on behalf of the public, and has a constitutional directive to ensure that navigation and commerce needs are maintained within harbor areas. DNR also recognizes that sediment remediation, habitat restoration, and harbor area development projects, while needed for our environmental and economic health, may conflict with long-term navigation and commerce needs and other uses (e.g., tribal fishing, recreational activities) of Elliott Bay and the Duwamish Estuary. Thus, DNR proposed that the goal of the Co-op should be to work together to identify and minimize

potential conflicts between activities in Elliott Bay and the Duwamish Estuary (DNR 1992). This goal was accepted by the Co-op participants. In discussing how the Co-op might work to reduce potential conflicts, it became evident that the cooperative forum also provided the participants with a unique opportunity to develop a generic conflict resolution planning method that might be used in other urban bays in Washington. Development of such a process then became a second goal of the Co-op. In practice, the model process was simultaneously developed and applied to Elliott Bay and the Duwamish Estuary.

CO-OP ACTIVITIES

The Co-op held twelve 4–6 hour meetings between July 13 and December 8, 1992, and conducted the following activities in the order provided. These activities also defined the model process.

Defined the Co-op's Outcome(s)

The Co-op considered a range of possible outcomes, as illustrated below, to further the conflict reduction goal for Elliott Bay and the Duwamish Estuary.

Outcome 1	Outcome 2	Outcome 3
Understanding of Participant Concerns and Limitations to Actions; Identification of Regulatory Authorities	Handshake Agreement: Maps, Management Objectives	Bureaucratic Action: Maps, Specific Plan and Environmental Impact Statement (EIS), Agency Actions
Low Public Involvement	→	High Public Involvement

Consensus on the final Co-op outcome was not readily achieved, and discussions regarding the appropriate outcome(s) continued throughout the Co-op process. The Co-op initially agreed that it would be appropriate to take some interim steps before deciding whether to develop a formal plan, including a programmatic EIS. Participants also agreed that the Co-op did not have sufficient funds to complete a programmatic EIS and that completion of an interim product would be very useful in demonstrating the degree of interagency cooperation, in identifying and perhaps resolving conflicts, and to facilitate soliciting the funds needed to prepare a more comprehensive plan, including an EIS, at a later time.

Defined the Planning Area Boundaries

The boundaries of the Elliott Bay/Duwamish Estuary study area were defined as follows:

Elliott Bay:	Alki Point to West Point, including Elliott Bay
Duwamish Estuary:	Includes the length of the East and West Waterways and the Duwamish Waterway from Puget Sound to the head of navigation (Turning Basin No. 3)

The shoreward boundary was defined consistent with the Shoreline Management Act as an upland line 200 ft from the shoreline.

Identified Appropriate Participants

Most of the agencies and organizations that participated in the Co-op process were identified prior to the start of the Co-op meetings based on their participation on the Panel or their interest in management of the area. All of the local governments, state and federal agencies, and Indian tribes with a management interest in activities within the geographic scope of the defined Elliott Bay/Duwamish Estuary study area were invited to attend. The Boeing Company owns a substantial amount of property within the study area and had been asked to participate on the Panel's technical working group discussions. The complete list of participants is provided Appendix A.

Policy and Regulatory Authority Presentations

Participants gave oral presentations on the policies and regulatory authorities relied upon in carrying out their management responsibilities in Elliott Bay and the Duwamish Estuary. Written materials addressing these policies and regulatory authorities were also provided to the Co-op. The purpose of this activity was to familiarize the participants with the environmental management concerns of other participants and to identify potential conflicts and overlaps between policies and regulatory authorities. A summary of the presentation and written materials is provided in Appendix B.

Mapped Elliott Bay and the Duwamish Estuary Into Management Units

The Elliott Bay and Duwamish Estuary study area was mapped into a total of 17 management units. The purpose of this activity was to define discrete locations that might require different management strategies. The seaward boundary for the management units adjacent to Elliott Bay is defined as the outer harbor line, or the point where the water is 80 ft deep, whichever is further from the shoreline. The management units defined for the East, West, and Duwamish waterways span the width of the waterways, so that all of the submerged land in the waterways is included in one or another management unit. As noted above, the shoreward boundaries for the management units are

defined as an upland line 200 ft from the shoreline. The north/south or east/west boundaries of each management unit were established at the point there is a shift in use, activities, or physical condition. The open-water areas of Elliott Bay were defined as one unit. The management unit map is provided in Chapter III (page 18).

Developed Management Unit Descriptions

The Co-op developed narrative management unit descriptions, including boundary definitions and a description of features present in each unit, to accompany the management unit map. The information included in these descriptions is intended to provide a basis for identifying potential conflicts. The described features include the following:

- Shoreline designations
- Property ownership
  - Submerged lands
  - Adjacent uplands
- Shoreline condition
- Shoreline uses
- Proposed uses
- Navigation
- Fishing Activities
  - Commercial
  - Treaty
  - Recreational
- Habitat type
- Habitat use
  - Function and evaluation species
- Physical dynamics
- Water characteristics
- Sediment characteristics
  - Quality
  - Type.

The final version of the management unit descriptions is provided in Appendix C.

Identified Management Issues

The Co-op developed a list of 10 "issues of concern" that includes specific issues participants would want addressed in a long-term management plan. In addition, the Co-op developed a list of 10 other issues that would not (or could not) be directly managed in a long-term management plan but were recognized as important and, therefore, appropriate for consideration in the context of the planning process. This second list of issues is referred to as "issues to be considered." The identified issues of concern and issues to be considered are set forth in Chapter III (pages 25 and 30).

Identified Compatibilities and Incompatibilities Between Issues of Concern

The Co-op developed a generic (rather than unit-specific) list of compatibilities and incompatibilities that may exist between the identified issues of concern to provide a basis for developing and focusing the content of a management plan for each unit. Because of the short time available, these statements were completed for only 3 of the 10 identified issues of concern (i.e., habitat, sediment cleanup, and navigation and commerce). These issues were selected because they were considered by the Co-op to be the most immediate and process driving issues of concern. The final compatibility/incompatibility lists for these three issues are provided in Chapter III (pages 31–43).

Developed Habitat, Sediment Cleanup, and Navigation and Commerce Map Overlays

The Co-op developed map overlays for the habitat, sediment cleanup, and navigation and commerce issues to familiarize the participants with the location of present and potential activities related to these issues, to graphically illustrate where there might be conflicts among activities, and to display potential conflict resolutions. This activity was again limited to these three issues because of the limited time and funds available. A map with all overlay information is provided in the pocket at the back of this report.

Developed Management Strategy Statements

The Co-op developed draft management strategy statements for each unit. The results of this activity represent a first attempt at developing unit-specific, long-term management strategies. Again, because of a lack of time and adequate funding, these statements were developed only for the issues of habitat, sediment cleanup, and navigation and commerce. These statements do not resolve all of the conflicts identified by the Co-op in earlier activities, but in the process of developing them the Co-op was able to identify the units where potential conflicts between these issues (particularly between navigation

and commerce and habitat) appear to be most significant (Units 4, 8, and 14). A complete list of potential conflicts between these three issues, on a unit-specific basis, is provided in Table 14. The final management strategy statements are provided in Chapter III (pages 47–49).

Evaluated Co-op Outcome

As a final step, the Co-op evaluated the results of the effort. The Co-op has been successful in familiarizing the participants with the management mandates of the other participants, and in identifying issues of fundamental concern to participants. Co-op activities provided a mechanism to identify the types of conflicts that may exist and to develop approaches to conflict resolution. The Co-op also provided a forum for the exchange of information about future planned projects, and the identification of areas where potential conflicts between three issues of concern (habitat, sediment cleanup, and navigation and commerce) appear to be most significant. Participants agree that most, if not all, potential conflicts between these three issues in the study area were identified. However, formal resolution of these potential conflicts was not attained. In addition, this study process did not include the public involvement that would be necessary when developing a formal (or even informal) conflict resolution policy. As such, the Co-op's outcome can be said to fall somewhere near the middle of the continuum of possible outcomes considered at the start of the study process.

Some participants had hoped that Co-op activities would result in a "decision document" that could be relied upon when conflicts between uses were identified. Indeed, early Co-op discussions were directed at achieving formal conflict resolution. However, in developing and applying the model process, participants realized that comprehensive planning requires the resolution of significant challenges among parties with diverse interests. Primary reasons why the Co-op was not able to identify and resolve all potential conflicts between activities in Elliott Bay and the Duwamish Estuary include the following:

- Resolution of conflicts between many and diverse interests requires a significant commitment of time and money. The Co-op had limited resources available for this study project.
- Some participants were reluctant at this point to develop a formal long-term management policy, and some participants believed that continued discussion still might not result in final resolution of all issues.
- Many participants believed that it would be appropriate to allow for a period of evaluation of the Co-op's results thus far, before deciding whether development of a formal management policy would be helpful or necessary.

As the primary initiator of the Co-op effort, DNR provided the following statement regarding the perceived need for and the success of, the Co-op process. DNR also

identifies several factors that the agency believes should be included in any similar baywide planning evaluation.

The Elliott Bay Co-op effort, initiated by the Department in 1992, was done in response to Department concern that an increasing number of individual fills (including habitat restoration, contaminated sediment cleanup and harbor development projects) were being proposed in Elliott Bay and Duwamish River without adequate coordination, planning, and impact evaluation among all of the affected agencies, tribes, and project proponents. The Department was concerned that unplanned piece-meal approval of projects would result in the consumption of public land with no evidence that the public benefit had been served. These benefits include both sustaining long-term ecosystem and economic viability and ensuring access to public lands and the benefits derived therefrom.

The Co-op effort also provided an opportunity to explore how best to accomplish a baywide evaluation so that all parties could reach consensus on the range of issues involved, the degree of conflict, if any, between those issues, and mechanisms for resolution of those conflicts.

At the outset, the Department had hoped that this baywide evaluation would result in a plan with a high degree of site specificity, allowing it, other agencies, tribes, and project proponents to know in advance the specific locations where specific types of projects should go to best serve the public interest. Due to a lack of adequate funding, time, and information, the group could not develop a site-specific plan. However, it was successful in forging a mutual understanding of the issues involved in Elliott Bay and the Duwamish estuary, the potential conflicts among uses, and an estimate of the effort needed to undertake this type of baywide evaluation.

The Department believes, however, that the product of the current level of effort represents a major step forward in understanding baywide concerns, limitations, and opportunities. It can be used to identify areas of potential conflict with navigation and commerce and other uses that must be addressed by project proponents through project SEPA compliance and is sufficient for the Department to use as part of a total process to evaluate the degree to which filling of state-owned aquatic land is in the public interest. When more information becomes available concerning the full extent and location of sediment cleanup, habitat restoration needs, timing of source control, and other aquatic-oriented projects in the area, development of a more specific plan which would involve public participation and a programmatic EIS might be considered.

Based on the experience gained in conducting the Elliott Bay Co-op effort, the Department feels that there are certain planning considerations that

must be a part of any baywide evaluation that will be used to justify allocation of state-owned aquatic land from multiple use to single use. These elements, developed in concert with the participating agencies and tribes, are:

- Cooperative discussion between agencies, tribes, and other interested entities identifying as accurately as possible a region's current and proposed human uses, natural resource uses, and environmental conditions (including, but not limited to, pollution source control, sediment contamination, habitat mitigation, restoration and enhancement, and navigation and commerce opportunities) as they relate to use (including filling of) aquatic land).

- Documentation of those uses and conditions, as specifically as the information will permit, on a geographic basis.

- Identification of any conflicts between those uses on a geographic basis.

- Identification of ways to deal with those conflicts.

- Informal implementation of a baywide evaluation through resolution by project proponents of the identified conflicts (and any conflicts subsequently identified) in justification for the use of state-owned aquatic land in the location requested relative to other locations in the area. This justification would be accomplished by project SEPA compliance (including public review) and supplementary processes (if necessary).

- If information permits and as appropriate, formal implementation of a baywide evaluation will be conducted with public participation and SEPA compliance.

REPORT USES AND FUTURE CO-OP ACTIVITIES

This document is available to all interested parties from DNR. The information provided herein does not represent new policy and is not binding upon the Co-op participants or members of the general public; it is intended to be used by Co-op participants as a coordination tool and by the participants and the general public as a reference document that may be consulted when considering future actions in Elliott Bay and the Duwamish Estuary or when conducting other regional conflict resolution activities.

The Co-op participants recognized that any formal use of the Co-op results would require full public participation and, therefore, decided that the planning activities conducted for

Elliott Bay and the Duwamish Estuary should be considered a study. This decision highlights the participants' desire to evaluate the study results (both the process and the products developed for Elliott Bay) before deciding whether to initiate a more formal action. The Co-op participants have agreed to meet again in mid-1993 to discuss whether further study is needed and whether a more formal plan should be developed.

I. INTRODUCTION

BACKGROUND

Elliott Bay and the Duwamish Estuary support a variety of human activities and provide habitat for numerous species of fish and wildlife. In both the bay and estuary, the shoreline has been greatly altered to support commercial and recreational vessel navigation; commercial, treaty, and recreational fishing; and retail and industrial operations. The bay and estuary are also relied on to receive storm water, waste water, and sewage discharges from both shoreline and inland industrial and residential sources. These and other human activities and uses have adversely impacted resources in these water bodies by degrading water quality, contaminating sediments, and filling nearshore habitat areas. Efforts are now underway to decrease ongoing pollution by controlling sources and to restore impacted habitat by remediating contaminated sediments and implementing specific habitat creation projects (either by restoring previously impacted habitat or mitigating habitat degradation resulting from shoreline development projects).

The challenge to state and federal proprietary and regulatory agencies, and local and tribal governments, is to manage the bay and estuary in a manner that will allow multiple uses and activities with as little conflict as possible while preserving and restoring environmental quality and resources. This challenge can only be met by taking a coordinated, long-term management approach involving conflict identification and resolution, rather than managing each use or activity in isolation of all others and without consideration of future needs and cumulative impacts. For example, current and future navigational needs should be considered when deciding whether capping contaminated sediments is an appropriate remedial response, and sources that may re-contaminate an area should be identified and controlled (to the extent possible) prior to implementing a habitat restoration project.

The following recent events have highlighted the need for a comprehensive management approach in Elliott Bay and the Duwamish Estuary:

- The National Oceanic and Atmospheric Administration (NOAA), the U.S. Department of the Interior, the State of Washington (through the Washington the Department of Ecology [Ecology]), the Muckleshoot Indian Tribe, the Suquamish Tribe of the Port Madison Indian Reservation (the Suquamish Tribe), the Municipality of Metropolitan Seattle (Metro), and the City of Seattle have entered into a consent decree (*United States et. al. v. City of Seattle and the Municipality of Metropolitan Seattle*, Case 90-395 [W.D. Washington]) addressing natural resource damages in Elliott Bay and the Duwamish River. Settlement funds provided for by the consent

decree are to be used in sediment remediation, habitat development (including real estate acquisition), and source control activities. Consistent with the consent decree, these parties created the Elliott Bay/Duwamish Restoration Program Panel (the Panel), which is charged with selecting and designing sediment remediation and habitat development projects and establishing source control goals to protect natural resources and prevent recontamination of sites selected for sediment remediation or habitat development. The Panel in turn created sediment and habitat technical working groups that are identifying potential sediment remediation and habitat development sites for consideration by the Panel. Because of its significant land ownership and possible participation in future land development activities, the Boeing Company was invited to participate in the technical working group discussions.

Sediment remediation and source control activities conducted under the consent decree will focus on storm drains and combined sewer overflows (CSOs), and several potential habitat development sites in Elliott Bay and the Duwamish Estuary are currently being evaluated by the Panel. Sediment remediation and habitat development decisions made under the consent decree may affect or conflict with the management concerns of state and federal agencies and local government offices that are not a part of the Panel. Thus, for the Panel to be successful in developing and implementing cleanup and restoration activities over the next several years, it must be aware of and sensitive to the concerns and priorities of these other organizations.

- Metro and the City of Seattle recently proposed capping contaminated sediments off Piers 54 and 55 on the Seattle waterfront. The area is next to the ferry terminal and is heavily used for navigational purposes by the ferry system and others. Any significant shallowing of the area resulting from capping activities would conflict with these navigational needs.

- The area around Harbor Island has been established as a federal Superfund site under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). Cleanup of this site will include remediation of contaminated sediments. The Wyckoff facility in West Seattle may also be added to the Superfund National Priorities List in the near future. Cleanup of this site will also include remediation of contaminated sediments. These activities raise important management concerns regarding appropriate remedy selection and the use and availability of nearshore or upland disposal locations for these and future site cleanups.

- The U.S. Fish and Wildlife Service (FWS), the U.S. Environmental Protection Agency (EPA), the U.S. Army Corps of Engineers (Corps), and the National Marine Fisheries Service are cooperating with the Port of Seattle and the U.S. General Services Administration in implementing several pilot habitat restoration projects in the Duwamish Estuary under

the Coastal America process. These projects are in addition to the projects that will be implemented under the consent decree. Similar to the Panel's activities, it is possible that these habitat restoration projects will affect or conflict with the management concerns of other agencies and organizations.

- In response to a 1992 policy statement issued by the Board of Directors of NOAA's Damage Assessment and Restoration Program (DARP), the Seattle DARP office is interested in developing a long-term habitat restoration planning process that takes a comprehensive, bay-wide approach, rather than a site-specific approach. Such a plan would include long-term (e.g., 20 years) monitoring of restoration projects. Recognizing that other issues such as land use and sediment remediation plans may affect restoration plans, NOAA believes it important that these issues are also considered in its comprehensive restoration planning process. Accordingly, the Seattle DARP office is interested in coordinating its restoration planning activities with the activities of other regulatory and proprietary agencies in the area.

- The Port of Seattle is proceeding with major development plans for the southwest harbor area, the East Waterway, and the central waterfront. These development plans include planning alternatives that could have a direct impact on sediment remediation and habitat development projects that might be located in these areas, and would directly influence the level of navigation and commerce activities conducted in these areas.

- The Boeing Company published a proposal in May 1992 that contains design guidelines for possible re-development of older manufacturing facilities adjacent to the Duwamish Estuary. The proposal, which is currently the subject of a non-project environmental impact statement (EIS) process, includes shoreline bank and fisheries habitat enhancements. Shoreline work would consist of replacing old bulkhead and rip-rap armorments with revetment systems incorporating intertidal beaches and riparian vegetation. A habitat enhancement project is also proposed as an element of a future Boeing shoreline/viewpoint trail link between the Museum of Flight and the King County Green River Trail. For these projects to be successful, Boeing needs to be aware of regulatory agency and local and tribal government concerns, and whether these activities might conflict with agency or governmental management responsibilities or other activities.

DNR'S PROPOSAL

The Washington Department of Natural Resources (DNR) manages state-owned aquatic land on behalf of the public and has a constitutional directive to ensure that navigation and commerce needs are maintained within designated harbor areas. In the past, DNR

has not generally allowed harbor areas to be filled for habitat creation because of conflicts with navigation and commerce needs. DNR recognizes that implementation of the activities mentioned above, as well as others that may be proposed by agencies or private landowners in the foreseeable future, may conflict with future needs of navigation, commerce, recreation, fishing, and other uses of the bay and waterway. DNR maintains that sufficient area must be left available for navigation and commerce, particularly in harbor areas, but acknowledges that opportunities for other uses should also be provided.

The recent effort by Metro and the City of Seattle to cap contaminated sediments off Piers 54 and 55 brought concerns about potential conflicts between activities to a head for DNR. Agency discussion surrounding issuance of a use permit for this project precipitated issuance of a DNR policy addressing fills (including capping). A bay-wide review of potential conflicts was part of this policy. DNR, with the support of other interested parties, therefore proposed establishing the Elliott Bay Cooperative Study (the Co-op). DNR's objective for proposing this effort was to provide proprietary and regulatory agencies, and local and tribal governments, with the opportunity to work together in a timely manner to identify general locations within Elliott Bay and the Duwamish Estuary where cleanup, restoration, navigation, recreation, fishing, and commerce could occur without significant conflict now or in the foreseeable future.

In response to this proposal, the Co-op was formed. Success of the cooperative process required money to facilitate the meetings, to provide a record of the meetings, and to prepare this report. Financial support for the Co-op's activities was provided by DNR, the Panel, NOAA, EPA, and the Port of Seattle. The Puget Sound Water Quality Authority (PSWQA) was particularly interested in fostering the Co-op's efforts to develop a model process for resolving conflicts that may be used in other bays (see discussion of the Co-op goals below) and, thus, supported the cooperative process by actively participating in the Co-op meetings and providing the support needed to complete the facilitation and report writing activities.

CO-OP PARTICIPANTS

The Co-op participants included representatives from the Panel, including the City of Seattle, Metro, Ecology, the Muckleshoot Indian Tribe, the Suquamish Tribe, NOAA, and FWS; non-Panel agencies and organizations including the City of Tukwila, the Port of Seattle, King County, PSWQA, the Washington Department of Fisheries (WDF), DNR, the Washington Department of Wildlife, the Corps, EPA, and the U.S. Coast Guard; and the Boeing Company (Boeing was involved because of their extensive ownership on the Duwamish River, and they were specifically invited by the Panel to participate in the Panel's technical working group discussions).

A list of the representatives from each of these agencies and organizations, including addresses, telephone numbers, and fax numbers, is included in Appendix A.

THE CO-OP GOALS: PROCESS AND PRODUCTS

DNR suggested that the goal of the Co-op should be to reduce to an acceptable level any conflicts among sediment remediation, habitat restoration, recreation, fishing, navigation, commerce, and other shoreline uses of Elliott Bay and the Duwamish Estuary (DNR 1992). This general goal was accepted by the Co-op participants. The issue then became what final outcome might be worked toward in the effort to achieve this goal, and what process should be followed or steps taken to reach the selected outcome.

The Co-op held a lengthy discussion about how formal the final product or outcome might need to be in order to further the conflict resolution goal and to meet the needs and expectations of participants. A range of possibilities, as illustrated in Table 1, was considered.

TABLE 1. RANGE OF POSSIBLE OUTCOMES

Outcome 1	Outcome 2	Outcome 3
Understanding of Participant Concerns and Limitations to Actions; Identification of Regulatory Authorities	Handshake Agreement: Maps, Management Objectives	Bureaucratic Action: Maps, Specific Plan and Environmental Impact Statement, Agency Actions
Low Public Involvement	⟶	High Public Involvement

Possible outcomes considered ranged from simply discussing participant concerns about the long-term management of Elliott Bay and the Duwamish Estuary to development of a formal management plan that would resolve, when possible, identified conflicts. The amount of time and money that would be needed to achieve an outcome along this range would likely increase significantly from one end to the other. The Co-op's discussion about an appropriate outcome for Elliott Bay and the Duwamish Estuary is provided in Chapter III.

In discussing what steps might appropriately be taken to achieve an outcome anywhere along the considered range, it was noted that there are no set and accepted conflict resolution procedures that the Co-op might follow. The participants, thus, recognized that this cooperative forum provided them with a unique opportunity to develop the tools needed, or a model process, for developing a conflict resolution management plan or strategy. The participants also recognized that it might be useful to develop a model process that could be applied in other Puget Sound urban bays, thereby streamlining the money and time that would be needed to create such plans for other locations.

Following these discussions, participants agreed that the Co-op should work toward two goals (Figure 1): 1) development of a conflict identification and resolution process that could be applied in other urban bays, and 2) application of the model process to Elliott

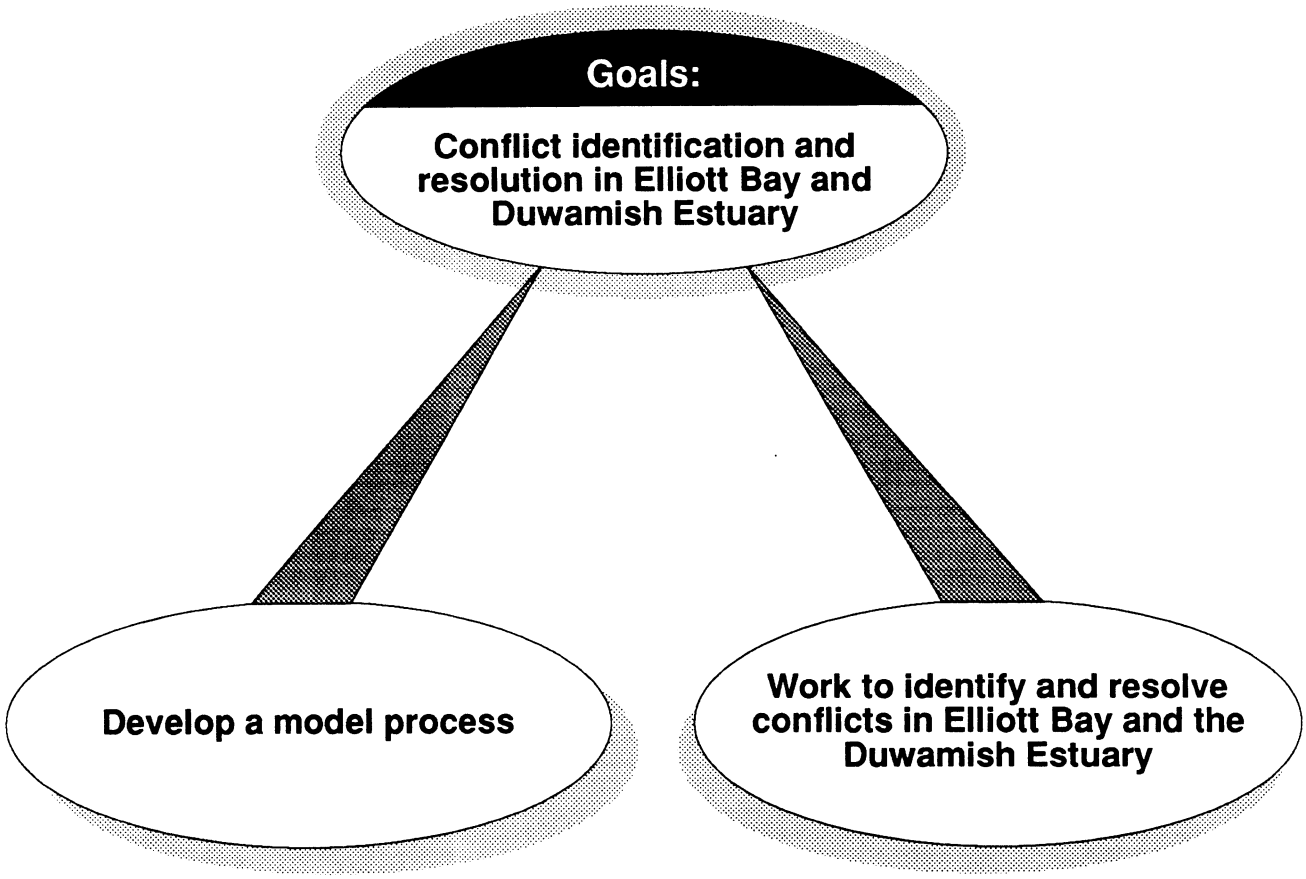

Figure 1. Co-op goals.

Bay and the Duwamish Estuary. In practice, the model process was simultaneously developed and applied to Elliott Bay and the Duwamish Estuary. Direct application of the process provided the Co-op with the opportunity to evaluate the appropriateness and utility of each of the steps developed along the way.

The Co-op participants decided that the planning activities conducted for Elliott Bay and the Duwamish Estuary should be considered a study in order to provide the participants with the opportunity to evaluate the results. These results do not represent new environmental policy and are not binding upon the Co-op participants or members of the general public; they are intended to help familiarize the Co-op participants and the public with the environmental management concerns of the Co-op participants and to be used by participants and the general public as a tool that can be consulted when planning different activities. Because no formal policy or plan was developed, it was decided that it would be inappropriate and unnecessary to subject these study results to the NEPA/SEPA public comment and review process.

Participants have agreed to meet again in mid-1993 to discuss the usefulness of the process and the value of the study results relative to Elliott Bay and the Duwamish Estuary. Depending on the evaluation results and future planning needs, a more formal policy or plan that would include an increased level of public involvement may be developed. Regardless of whether the Co-op conducts further activities, all participants agreed that the results of the Co-op's activities to date made the commitment of time and money worth while.

The model process developed by the Co-op is discussed in Chapter II, and application of the process is set forth in Chapter III. A brief analysis of the strengths and weaknesses of the process as applied to Elliott Bay and the Duwamish Estuary is then provided in Chapter IV, and recommendations for future Co-op activities are set forth in Chapter V.

II. THE MODEL PROCESS

A model process for developing an aquatic management strategy aimed at identifying and resolving conflicts between activities and uses in urban bays was formulated by the Co-op. This model includes the following aspects or activities:

- Outcome definition
- Geographic considerations
  - Planning area boundaries
  - Management unit boundaries
- Participant considerations
  - Identifying appropriate participants
  - Identifying participant statutory and regulatory mandates and authorities
- Management issues
  - Developing management unit descriptions
  - Identifying appropriate management issues
  - Identifying potential conflicts between issues
  - Mapping major uses
- Management strategy statement development
- Outcome evaluation.

Each of these activities is discussed in this chapter. The Co-op found that the order in which these various activities are conducted is important. Several activities (outcome definition and geographic and participant considerations) were addressed at the same time. The order in which all activities were conducted in the Elliott Bay/Duwamish Estuary study process is set forth in Chapter III.

OUTCOME DEFINITION

The planning process should begin with an effort to identify the outcome(s) that the process hopes to achieve in furthering the conflict reduction goal. An appropriate outcome in one location might be to simply identify possible conflicts that can then be

taken into consideration in future management activities. In another location, it may be necessary to allow for significant public involvement and development of a formal plan to ensure that conflicts or concerns are adequately addressed. Defining the goal early (or at least an interim goal) will help to focus the level of detail, content, and direction of later planning activities. However, it is also possible to modify the final outcome goal as the process continues. For example, if there is little money available at the start of the project, or if agreement between participants is not readily achieved, it may be appropriate to begin by only working toward conflict identification. If more money becomes available after the process is underway, or if participants reach agreement later in the process, it may be appropriate to re-define the final outcome goal. It is recommended that there be two phases to the process: Phase I is conflict identification and Phase II is conflict resolution. Conflict identification is a justifiable and separate part of the overall process; it is important in its own right. Conflict resolution can then occur under a different time frame and method of resolution (i.e., single agency case-by-case to multi-agency memorandum of understanding).

GEOGRAPHIC CONSIDERATIONS

The planning process should include identification of the overall planning area and a consideration of whether that area should be divided into smaller management units.

Planning Area Boundaries

The overall geographical boundaries of the planning area should be defined. This activity should include defining both the shoreward and seaward boundaries of the planning area. The results of this activity will help to define the management issues that should appropriately be considered and the participants that should appropriately be included in the planning process.

Management Unit Boundaries

The planning area should be evaluated with regard to whether it should be divided into smaller management units. This subdivision may be appropriate if discrete locations in the planning area are significantly different from other portions of the planning area and, therefore, require different management approaches. For example, habitat development approaches appropriate in an area with little navigation activity may not be appropriate in an area that is heavily used for deep draft navigation. In addition to defining the shoreward and seaward boundaries, appropriate north/south or east/west boundaries of each management unit should also be defined. It is also useful to map this boundary information to provide a visual illustration of the planning area and to facilitate further discussions.

PARTICIPANT CONSIDERATIONS

The planning process should include identification of all appropriate participants and their associated management concerns. This step ensures that the original participants evaluate the need for additional participants (with perhaps additional management concerns) to join the process.

Identifying Appropriate Participants

Federal, state, and local agencies; tribal governments; and private organizations that should be invited to participate in the planning process must be identified. Failure to include (or at least invite) all interested parties could hinder planning efforts later on. Including all appropriate parties early in the process helps to create a cooperative attitude among those present and helps to minimize the need to explain decisions anew as the process progresses. The geographical boundaries defined for the management area will help to define the appropriate participants.

Identifying Participant Statutory and Regulatory Mandates and Authorities

Identification of the regulatory authorities relied on by the agency or other governmental participants when carrying out or regulating activities is useful to familiarize all participants with the environmental management concerns of the other participants, and to identify potential conflicts and overlaps between the regulatory authorities. Oral presentations of the regulatory authorities are useful because they generate discussion among the participants that may help to clarify misconceptions. A written record of the regulatory authorities is also useful as an independent reference document that may be consulted when conducting or evaluating various activities. Other participants, such as industry or environmental group representatives, may also be invited to present their particular concerns so that they may also be taken into consideration in the planning process. This information should also be incorporated into the written record.

MANAGEMENT ISSUES

The planning process should include a description and map of management units, and identification of management issues of concern and potential conflicts.

Developing Management Unit Descriptions

Narrative management unit descriptions, including important physical features and current uses of a unit, provide the basis for differentiating between management units. Management unit descriptions are also useful as a basis for defining potential conflicts.

A long-term management plan might require, for example, modification of a current or potential activity in a unit in preference of another activity. Management unit descriptions should accompany a map of management units as an explanatory reference document.

Identifying Appropriate Management Issues

Issues of concern (including both current and possible activities or uses) to the participants that might appropriately be addressed in a long-term management strategy must be identified. This activity helps to foster cooperation among participants by assuring that participant concerns are brought to the table for consideration.

It may not be possible to definitively address all identified issues; for example, it may not be possible to directly address policies regarding treaty rights or aesthetics in a long-term management strategy. However, it is useful to prepare a second list of such issues that may then be taken into consideration when developing a management strategy. Documentation of these additional issues also provides a record that these issues were, in fact, acknowledged and considered, not ignored.

Identification of Potential Conflicts Between Issues

The planning process should include the identification of compatibilities and incompatibilities (or potential conflicts) between the identified management issues. This activity should not simply identify, for example, that one activity is or may be incompatible with another issue. Rather, the *specific elements* of an activity that may be incompatible with another activity should be identified. The results of this exercise may then be used as a foundation for developing and focusing the content of a conflict resolution management strategy for each unit.

Mapping Major Uses

Preparation of graphic overlays of the identified current or possible uses or activities is useful to illustrate where uses and activities are or may be located and where conflicts between activities or uses might occur. Examples of the type of information that could be provided on overlay maps include identification of existing habitat areas and potential restoration sites; CSOs, major storm drains, areas of known sediment contamination, and potential cleanup sites; and navigation lines. Certain conditions that might be used as minimum performance standards (e.g., identification of water depths that must be maintained) can also be included at this stage.

MANAGEMENT STRATEGY STATEMENT DEVELOPMENT

Management strategy statements should be developed on a unit-by-unit basis, taking into consideration identified current and potential uses within a unit and any identified potential incompatibilities or conflicts between such uses. The intent of this activity is to document unit-specific, long-term management strategies that would resolve, when possible, identified incompatibilities; to identify unresolvable conflicts; and to enhance compatible activities.

OUTCOME EVALUATION

The final step in the management plan development process is to evaluate whether the selected outcome has been achieved, and whether the actual outcome (regardless of whether it is the selected outcome) meets the needs and expectations of the participants. It is possible that as the development process is carried out, the anticipated outcome will be modified.

III. MODEL PROCESS APPLICATION

The general goals of the Co-op were to develop a conflict resolution process that could be applied to other bays, and to apply the process to Elliott Bay and the Duwamish Estuary. In practice, the process was developed and applied simultaneously. The Co-op held twelve 4–6 hour meetings between July 13 and December 8, 1992. In addition, a subgroup of Co-op participants met one time to develop the format for this report, and the Co-op as a whole met twice to review two drafts of this report.

A professional facilitator was hired to mediate the Co-op's discussions. However, as the meetings progressed, the participants became more comfortable with one another and displayed a willingness to cooperate among themselves. Accordingly, after the sixth session, it was decided that the remaining meetings would be facilitated by DNR staff. The total support for this study included facilitation of the first 6 meetings, preparation of summaries of the 12 meetings, and preparation of two drafts and this final report.

During the Co-op meetings, participants conducted the various activities described in Chapter II. These activities were carried out in the following order:

- Discussed the Co-op's outcome(s)
- Defined the study area boundaries
- Identified appropriate participants
- Presented participant policies and regulatory authorities
- Mapped Elliott Bay and the Duwamish Estuary into management units
- Developed management unit descriptions
- Identified management issues (referred to as issues of concern and issues to be considered)
- Identified compatibilities and incompatibilities between issues of concern
- Developed habitat, sediment cleanup, and navigation and commerce map overlays
- Developed management strategy statements
- Evaluated Co-op outcome.

This chapter discusses each of the above-listed activities and describes the products developed.

DISCUSSION OF OUTCOME(S)

The Co-op considered a range of possible outcomes, as discussed below, that could be worked toward in an effort to reduce conflict between activities in Elliott Bay and the Duwamish Estuary (see Table 1).

Identification of Participant Concerns

At one end of the range, participants could simply agree to discuss and be aware of other participant's concerns about the long-term management possibilities, resolving concerns when possible. While all participant concerns may not be resolved, their disclosure would enable all concerns to be considered during future activities. Taking these concerns into consideration might, in practice, help reduce conflicts. This option would not require significant public involvement.

Identification of Regulatory Authorities

A second option would be for participants to identify the regulatory authorities relied upon when carrying out their responsibilities. Conflicts and overlaps between authorities could be identified, and provisions of authorities could be clarified for those unfamiliar with them. A summary and analysis of authorities that must be consulted when conducting various activities (e.g., preparing sediment cleanup or habitat restoration plans) would be useful to both agencies and the general public. This option would also not require significant public involvement.

Development of Informal Guidance

A third option would be to develop informal guidance identifying potential conflicts between uses and specific management objectives for different areas (or management units) within the management project area that participants would agree to consider when conducting specific activities. This information could be consulted by agencies when reviewing permit applications and could be used to resolve identified conflicts between different regulations and agency programs. This option would likely require somewhat more public involvement than the first two options. Some participants thought that development of even informal "guidance" or "guidelines" would require preparation of an EIS and cautioned against this activity unless extensive public involvement was provided for.

Development of a Formal Management Plan

A fourth option would be to develop a specific and formal management strategy plan. This plan could identify locations (or management units) where a particular activity is a

priority; for example, locations that receive a high priority for placement of habitat mitigation projects. The plan need not preclude mitigation of non-priority locations, but the project proponent would have to provide some justification for why the project should be allowed to proceed. This outcome would require significant public involvement and preparation of an EIS.

Participant opinions about the appropriateness of the fourth option varied significantly. Some strongly supported this option, noting that an interagency/intergovernmental agreement without public involvement and preparation of a programmatic EIS would not be very meaningful or implementable. The Co-op was identified as the best forum for preparation of a long-term comprehensive management plan. Some participants indicated that they were uncomfortable with committing up front to preparing an EIS when such a document might not be necessary. These individuals suggested that it may be appropriate to complete some interim activities before deciding whether a formal plan and EIS should be developed. Others questioned whether the agencies would be willing to integrate activities if the Co-op were to formalize a bay-wide management plan in a programmatic EIS. The question was also raised as to what activities or actions an EIS would address; the Co-op must first develop a plan for which an EIS would be written.

Some participants were against this option, noting the time and expense that preparation of an EIS would require. Some activities (in particular, cleanup and restoration activities under the consent decree) would need to be started, if not finished, in the length of time that it would take to prepare a programmatic EIS. Others responded that cleanup and restoration activities need not cease until a programmatic EIS is completed, and the Puget Sound Dredged Disposal Analysis (PSDDA) was cited as a possible model for the Co-op's final product. All dredging and disposal of dredged material did not cease while the PSDDA project was underway. Instead, the agencies involved agreed ahead of time to abide by the PSDDA guidance once the study was complete and to abide by conservative interim criteria until that time. In addition, PSDDA is re-evaluated on an annual basis, which provides the opportunity to resolve unresolved issues and to refine requirements as necessary. Development of PSDDA was a cooperative interagency action and an EIS was prepared. However, PSDDA is only a cooperative agreement consistent with the agencies' authorities; it does not override these authorities. For an approach similar to that used in PSDDA or any other cooperative effort to succeed, the participants must be committed to a long-term planning and management implementation process.

Some participants noted that although PSDDA is a good model, it is issue-specific (dredged disposal). Development of a bay-wide management plan would have to address a much wider range of issues than are addressed by the PSDDA program and, thus, the time and cost that would be needed to prepare an EIS for a bay-wide management plan would exceed the time and cost required for PSDDA (4.5 years; $4.5 million). Others countered that in the PSDDA project, significant funds were spent in addressing hard science issues and evaluating various potential disposal sites. The Co-op would not need to spend as much on costly activities such as these, so preparation of an EIS for a bay-wide management plan should not be as time-consuming or costly as PSDDA. Others responded that some scientific questions (e.g., where best to locate salmon habitat) would

have to be addressed in the preparation of an EIS for a bay-wide management plan as well, and the cost of an EIS could thus be significant.

Conclusion

Consensus on the final Co-op goal was not readily achieved, and discussions regarding the appropriate outcome(s) continued throughout the Co-op process. The participants did agree that it would be appropriate to take some interim steps before deciding whether to prepare a formal management plan and a programmatic EIS. Participants also agreed that although the Co-op did not have sufficient funds up front to complete a programmatic EIS, an interim product or plan would have value unto itself and would be very useful in soliciting funds to prepare a more comprehensive plan and EIS at a later time, if deemed appropriate.

DEFINITION OF THE STUDY AREA BOUNDARIES

The boundaries of the Elliott Bay/Duwamish Estuary study area were defined as follows:

Elliott Bay:	Alki Point to West Point, including Elliott Bay
Duwamish Estuary:	Includes the length of the East and West Waterways and the Duwamish Waterway from Puget Sound to the head of navigation (Turning Basin No. 3)

The shoreward boundary was defined, consistent with the Shoreline Master Program, as an upland line 200 ft from the shoreline. However, the Co-op acknowledged that activities further inland might influence sediment and water quality and restoration activities within the 200-ft limit and, thus, restoration opportunities may be present in these more remote locations. The seaward boundaries were defined on a unit-by-unit basis, as discussed under *Developing Management Unit Map*, below.

There was some discussion about expanding the study area to include the Duwamish River upstream from Turning Basin No. 3. However, it was also noted that management decisions could become more difficult as the geographic scope increases and, thus, the size of the area included in the study would have to be cut off at some point. While recognizing that the area could be expanded if appropriate for future Co-op activities, it was decided that Turning Basin No. 3, as the head of navigation, was an appropriate upstream boundary for the present study.

IDENTIFICATION OF PARTICIPANTS

The agencies and organizations that participated in the Co-op process were identified prior to the start of the Co-op meetings. All of the local governments, state and federal agencies, and Indian tribes with a management interest in activities within the geographic

scope of the defined Elliott Bay/Duwamish Estuary study area were invited to attend. As an owner of a substantial amount of property within the study area, the Boeing Company was invited to participate in both the Panel's technical working group and the Co-op discussions.

The complete list of agencies, governments, and organizations that participated in the process is provided in Chapter I, and a list of representatives from each of these agencies, governments, and organizations is provided in Appendix A. King County was provided with all records of the Co-op activities and provided some regulatory authority information to the Co-op, but did not attend any Co-op meetings. Similarly, the U.S. Coast Guard attended only the first few meetings, but was provided with all of the Co-op's written materials and provided regulatory authority information. All other participants listed in Chapter I regularly attended the Co-op meetings and participated in the Co-op's activities.

As indicated above, some participants noted that there is a potential for activities to affect water and habitat quality further up the Green/Duwamish River system. These participants suggested that the cities of Auburn and Kent might be included in the cooperative study process whether or not the geographic scope of the study area was expanded. While again recognizing that upstream activities may contribute to contamination of the system, the Co-op agreed to limit the participant list to those agencies and organizations with a management interest in the geographically defined study area. The participant list will be re-evaluated as appropriate for future Co-op activities.

PRESENTATIONS OF POLICIES AND REGULATORY AUTHORITIES

Representatives from the participating agencies, governments, and organizations (except the U.S. Coast Guard, the Washington Department of Wildlife, King County, and Boeing) gave oral presentations of the policies and regulatory authorities relied upon in carrying out their management responsibilities in Elliott Bay and the Duwamish Estuary. Written materials addressing policies and regulatory authorities were also provided to the Co-op. The type of information provided and the level of detail differed from one organization to the next depending on what issues the presenters considered important. A summary of the presentations and written materials is provided in Appendix B.

DEVELOPMENT OF MANAGEMENT UNIT MAP

The Elliott Bay and Duwamish Estuary study area was mapped into a total of 17 management unit areas that might require different management strategies (Figure 2). The seaward boundary for the management units adjacent to Elliott Bay is defined as the outer harbor line or the point where the water is 80 ft deep, whichever is further from the shoreline. Selection of this boundary was based on the location where most of the anticipated habitat restoration and dredging and capping activities will take place (i.e., in

depths less than 80 ft). The management units defined for the East, West, and Duwamish waterways span the width of the waterways, so that all of the submerged lands in the waterways are included in one or another management unit. As noted in *Defining Study Area Boundaries*, the shoreward boundaries for the management units are defined as an upland line 200 ft from the shoreline.

The north/south or east/west boundaries of each management unit were established at the point where there is a shift in use, activities, or physical condition. Although the Co-op is primarily concerned with differences in shoreline areas and will likely make few management decisions pertaining to the open-water areas of Elliott Bay, it was decided that for completeness, one or more units should be defined for this area. Because any management decisions pertaining to the open-water area of Elliott Bay would likely be similar throughout, the Co-op decided that it would be appropriate to define the entire deeper water area as one unit (Unit 1).

Unit 2 is primarily natural, undeveloped coastline, while Unit 3 is primarily developed (marina and piers). The boundary between Units 2 and 3 was placed where this shift in use and physical condition occurs. Unit 4 is primarily a park area, and Unit 5 is developed (primarily individual piers). Although Unit 6 is also a developed area, it is separated from Unit 5 because of a shift from individual piers with retail-type businesses to a single solid structure used for container terminals and vessel berthing.

Unit 7 is exposed to the open bay and is or has been used for industrial activities. This unit also contains a portion of the Harbor Island Superfund site and a portion of the Wyckoff site (a potential addition to the National Priorities List). Unit 8 is split from Unit 7 because of a decrease in industrial activity. Unit 9 is separated from Unit 8 because of a shift in use (primarily residential and retail-type businesses). Unit 10 is split from Unit 7 because it represents a shift from the open bay to an interior waterway. Unit 11 differs from Unit 10 in that the waterway in this area is more narrow than in Unit 10, it is an area of high water velocity, and there is a difference in the type of bottom sediments. Unit 12, like Unit 10, is defined by the shift from the open bay to an interior waterway. Unit 13 is separated from Unit 12 because of a shift in use (Unit 13 is shallow and is not usable by deep-draft vessels). Finally, Units 14 through 17 have been defined in terms of shoreline conditions, activities, and ownership.

The Co-op also developed narrative boundary definitions that set forth the physical features and landmarks that separate one unit from the next. For example, the boundaries for Unit 2 are defined as "West Point to the west side of the Elliott Bay Marina," and the boundaries for Unit 3 are defined as "from the west side of the Elliott Bay Marina east to the southwest edge of Pier 89 including the marina, Smith Cove Park, and the slips of Terminal 91." These boundary definitions are included in the narrative management unit descriptions that are discussed in the next section and provided in Appendix C.

One participant, who is concerned with fisheries management, stated that from a fisheries habitat standpoint, Elliott Bay and the Duwamish Estuary need only be divided into 3 or

4 management units, rather than 17. Other participants acknowledged that the management units could be split in many different ways depending on what factors are considered. The Co-op decided that the most useful factors to consider in defining management units in this study include uses, activities, and physical features. The management unit boundaries may be changed at a later time if participants decide that additional (or fewer) factors should be considered.

DEVELOPMENT OF MANAGEMENT UNIT DESCRIPTIONS

The Co-op developed narrative management unit descriptions, including narrative boundary definitions and a description of features present in each unit, to accompany the management unit map. The intent of this exercise was *not* to institutionalize the status quo, as feared by some participants. The information included in these descriptions is intended to provide a basis for identifying conflicts.

The Co-op held several discussions about what features should be appropriately included in the management unit descriptions, and the list of features was refined over time. The final list of feature categories is as follows:

- Shoreline designations
- Property ownership
  - Submerged lands
  - Adjacent uplands
- Shoreline condition
- Shoreline uses
- Proposed uses
- Navigation
- Fishing Activities
  - Commercial
  - Treaty
  - Recreational
- Habitat type
- Habitat use
  - Function and evaluation species
- Physical dynamics
- Water characteristics

- Sediment characteristics
  - Quality
  - Type.

The final version of the management unit descriptions is provided in Appendix C. Co-op discussions about these feature categories are summarized below.

To start the discussion about what features would be appropriately included in the management unit descriptions, DNR provided the participants with a sample list of feature categories. This original list was refined to more accurately capture each participant's concerns. In completing this activity, some cautioned against providing more detail than would be of use in later activities. The following modifications were made to the original list of feature categories:

- **Shoreline Designation**—This category title was changed from *City Shoreline Designation* in recognition that shoreline designations may be made by other local jurisdictions besides the City of Seattle or the City of Tukwila under the authority of the Shoreline Management Act (SMA).

- **Property Ownership**—This category title was changed from *Shoreline Property Ownership* to *Property Ownership* with the subcategories of *Submerged Lands* and *Adjacent Upland* to recognize that the Co-op is interested in the ownership of both types of property. It was decided that this category should also identify the predominant owner of the property when known.

- **Shoreline Condition**—This category title was changed from *Shoreline Type* to better reflect the kind of information the Co-op intended to be provided (i.e., information about the physical condition of the shoreline). In particular, this category should discuss whether the shoreline is unaltered (natural) or altered, and if altered, how it has been altered (e.g., piers and riprap).

- **Proposed Uses**—This category was originally titled *Development Plans*. The intent of this category is to identify planned activities that would not necessarily drive the development of a management strategy but could be considered by the Co-op in this context. For example, it would be useful to know that the Port of Seattle has development plans in a particular unit when planning a management strategy for that unit. The Port of Seattle could then be consulted when developing that strategy. Information set forth in this category might also bring to light potential conflicts. It was decided to change this category from *Development Plans* to *Proposed Uses* to recognize that the Co-op is equally interested in identifying such things as restoration plans. In addition, the term "plans" is vague and could include both formally documented plans or wished-for plans.

- **Fishing Activities**—This category was originally titled *Fisheries*. The title was changed to *Fishing Activities* to focus the information provided in this category on whether or how fish are harvested, not whether the unit is used by a fishery. The suggested title, *Fish Harvest*, was rejected because people may be fishing while not actually harvesting anything. The subcategories of *Commercial, Treaty,* and *Recreational* were added so that the type of fishing activity could be clearly identified.

- **Habitat Type**—*Habitat Type* replaced *Intertidal and Subtidal Habitat* so that upland habitats might also be identified. For the sake of brevity, and because of a lack of time and money, this category identifies only unique habitats, rather than all habitat environments that may be present in the unit.

- **Habitat Use**—*Habitat Use* replaced *Fish and Wildlife Use*. Whether the habitat is actually used and by which resources would be identified in this category. *Shoreline Uses*, another category included in the unit feature list, should be used to define human uses, while *Habitat Use* should be used to define use of the habitat by fish and wildlife resources. The information provided in this category does not include all species and all uses of habitat in the management unit descriptions; it includes only unit-specific evaluation species and selected uses of the habitat by these species that may influence management decisions. Representatives from FWS, WDF, and the Suquamish Tribe developed a summary matrix of habitat use by particular target species for the 17 management units. The matrix was adopted by the Co-op and is provided in Table 2.

- **Physical Dynamics**—This category was originally titled *Currents/Sediment Transport Information*. Some participants questioned whether this category was needed while others thought that this type of information could be important when selecting future restoration or development sites. It was then decided to broaden this category to *Physical Dynamics* so that other potentially important physical processes, in addition to current and sediment transport information, could be included.

- **Water Characteristics**—This category title was changed from *Water Quality* because of participant concerns about the word "quality." In particular, some felt that it may be more helpful to provide a more descriptive statement than would fit in the *Water Quality* category (e.g., it might be more helpful to say "supports fisheries" rather than simply indicating that the water quality is "good" or "poor").

- **Sediment Characteristics**—This category title was originally *Sediment Quality*. Like the *Water Quality* category, some participants expressed concern about the word "quality." It was thought that the category *Sediment Characteristics* would allow for broader description of the sediments in the units. To further define the type of information that the Co-op

TABLE 2. USES OF EXISTING HABITAT (BY UNIT)

Units	Salmonids: Out-Migrants	Salmonids: In-Migrants	Marine Fish (rockfish, flat fish, smelt)	Shellfish	Management Periods/Notes[a]
Lower River—Units 15–17	- Feeding - Rearing - Transition (smolt)	- Holding (adults)	- Minimal management		3/15–6/15 WDF/WDW closure for out-migration; salmon fishing 7/12–11/28; winter steelhead fishing 11/1–4/30
Inner Bay/ Waterway—Units 6–15	- Feeding - Transition (smolt) - Migration	- Holding (adults)	- Feeding - Seasonal migration	Spring-summer juvenile migration (crabs)	3/15-6/15 WDF/WDW closure for out-migration; salmon fishing 6/7–11/28; winter steelhead fishing 11/1–4/30
Outer Bay—Units 2–9	- Feeding - Rearing	- Feeding - Holding (adults)	- Feeding - Rearing - Spawning	- Units 2-9: crabs through life cycle - Units 2–4, 9: bivalves through life cycle	3/15–6/15 WDF/WDW closure for out-migration; salmon fishing 6/7–11/28; winter steelhead fishing 11/1–4/30 - Kelp (managed year-round) - Eelgrass (managed year-round)
Offshore Deeper Water—Unit 1	- Feeding - Rearing	- Feeding - Holding (adults)	- Feeding - Rearing - Spawning	- Crabs, shrimp, and bivalves through life cycle	Salmon fishing 6/7-11/28; winter steelhead fishing 11/1–4/30 - Kelp (managed year-round)

[a] Management periods are relatively stable, changing very little year by year (Lutz and Tynan 1992).

wanted to include in this category, the subcategories of *Quality* and *Type* were added.

IDENTIFICATION OF MANAGEMENT ISSUES

Issues of Concern

The Co-op developed a list of 10 issues of concern, which includes specific issues that participants would want addressed in a long-term management plan. DNR provided a sample list of issues for discussion and several modifications and additions were made by the Co-op participants. The final list of issues of concern is presented in Table 3. Discussions that were held about the various issues are summarized below:

Navigation and Commerce

DNR and the Port of Seattle identified this as a very important issue that should be included in a long-term management plan. DNR is constitutionally mandated to reserve harbor areas for navigation and commerce-related activities (harbor areas are to be "forever reserved for landings, wharves, streets and other conveniences of navigation and commerce," RCW 79.90.020). However, it is DNR's interpretation that the agency has the authority to be somewhat flexible in making judgments about appropriate uses of state-owned, submerged lands.

Decision—Because development for navigation and commerce is a major cause or catalyst for changes to the shoreline and submerged land, it was decided that this issue should appropriately be considered an issue of concern.

Recreation

Little discussion was held about this issue.

Decision—*Recreation* with the subcategories of *Water-Dependent* and *Non-Water-Dependent*, was maintained as an issue of concern. For clarification, a baseball field and a roller rink were mentioned as examples of non-water-dependent recreation. Fishing was mentioned as an example of water-dependent recreation.

Public Access

There was a lengthy discussion about what this phrase means. For example, is a road considered public access or a thoroughfare? Does public access only mean access to the

TABLE 3. ISSUES OF CONCERN

1. Navigation and Commerce
2. Recreation
   a) Water-dependent
   b) Non-water-dependent
3. Public Access (upland and on-water access)
   a) Unrestricted (for example, no monetary cost)
      i) Physical
      ii) Visual
   b) Restricted (for example, requires a fee; access limited to specific hours)
      i) Physical
      ii) Visual
4. Habitat
   a) Existing
   b) Potential
5. Sediment Cleanup
   a) Need for cleanup (ranking and prioritization)
   b) Methods of cleanup
6. Shoreline Development
   a) Type
      i) Water-dependent
      ii) Water-related
      iii) Water enjoyment
      iv) Non-water-dependent
   b) Nature
      i) Permanent
      ii) Nonpermanent
7. Fishing
   a) Commercial
   b) Treaty
   c) Recreational
8. Clean Sediment Withdrawal
9. Sources of Pollution
   a) Status/level of corrections
   b) Type
      i) Point
      ii) Nonpoint
      iii) Pollutant(s) of concern
10. Land Alteration
   a) Fill
      i) Conversion to upland
      ii) Shallowing
   b) Dredge
      i) Conversion to aquatic land
      ii) Deepening

shoreline? Can public access be both recreational and non-recreational? In the first version of this list it was decided that the subcategories of *Free* and *Other* should be included. *Free* was intended to mean that there is no cost, and access is not restricted. *Other* was intended to mean that the access costs some fee or is restricted in some manner (e.g., park access is often restricted by being closed after dark, fenced off, or allowing entry only at pay booths).

Decision—Upon further discussion, it was decided that the subcategories of *Restricted* and *Unrestricted* might capture the Co-op's intent more closely than *Free* and *Other*. Further subcategories of *Physical* and *Visual* were also included. In addition, it was agreed that the Co-op's definition of "public access" would include both upland access (i.e., physical access from land to the water; visual access to the water from land) and on-water access (i.e., access from the water to the shoreline for docking or resting purposes).

Habitat

Participants noted that there are really two types of habitat of concern to the Co-op: already existing habitat and habitat that could be created (or restored, etc.). Some participants suggested that there is a need to recognize that habitat may be degraded in some locations and enhanced in others. Others said that the Co-op should start with the assumption that all of the area is habitat. Some participants noted that it might be useful to include subcategories that identify whether habitat is present or not (or low in value); this information may influence whether to conduct a particular activity or to make a particular management decision. The subcategories of *Existing* and *Potential* were then suggested. Others responded that *Existing* and *Potential* really pertain to all of the issues of concern.

Decision—*Habitat* was maintained as an issue of concern, and while the Co-op recognized that the *Existing* and *Potential* subcategories pertain to all of the issues, it was decided that they should be specifically mentioned under habitat because of their importance in this case.

Sediment Cleanup

Sediment cleanup was identified as an important issue of concern because the state Sediment Management Standards (Chapter 173-204 WAC) require cleanup of contaminated sediments, and the method of cleanup may affect existing habitat and potential habitat development projects and navigation and commerce needs and activities.

Several diverse subcategory suggestions were made including, for example:

- *Appropriate Cleanup Methods* and *Availability of a Disposal Site Within the Unit*
- *Preserve Habitat* and *Preserve Navigation*
- *Superfund, Voluntary, Model Toxics Control Act*, and *Other*
- *Site Ranking* and *Prioritization*
- *Need for Cleanup (ranking and prioritization)* and *Method of Cleanup.*

Several participants thought that it was not appropriate to include regulatory authorities here, as a management strategy should provide general guidance for sediment cleanup. Others suggested that *Need for Cleanup (ranking and prioritization)* and *Method of Cleanup* would be the appropriate subcategories. Some participants questioned whether the *Need for Cleanup* subcategory was necessary. The issue is that, for whatever reason, a cleanup decision has been made. The concern is then the type of cleanup that will be done. As such, the level of contamination may not be an issue. Others responded that this subcategory is important for several reasons, including that this type of information may be used as a tool for prioritizing sites, and that knowledge that cleanup is not needed (or that the need is very low) may open up other options for use of an area.

Decision—*Sediment Cleanup* with the subcategories of *Need for Cleanup (ranking and prioritization)* and *Method of Cleanup* was maintained as an issue of concern.

Aesthetics

Participants noted that aesthetics is an important consideration under the SMA, an issue that comes up in conjunction with public access and other issues, and an issue that would have to be considered in preparation of an EIS if the Co-op goes that far. Some questioned whether the Co-op would actually manage for aesthetics.

Decision—Although aesthetics is an important issue, it probably would not be directly managed in a long-term management plan and, thus, was moved to the policy issues to be considered list (see *Policy Issues to Be Considered* below).

Shoreline Development

Shoreline development was considered an important management issue because such activities may affect habitat, sediment cleanup, and navigation and commerce activities. After discussion, participants added the subcategories of *Water-Dependent* and *Non-Water-Dependent*. These subcategories were later debated and it was suggested that the Co-op try to distinguish between development that does or does not preclude other

development in the future. Perhaps the Co-op should consider the nature of the use (e.g., whether it would be permanent) in addition to the type of the use.

Decision—*Shoreline Development* with the subcategory of *Type* and the further subdivisions of *Water-Dependent*, *Water-Related*, *Water Enjoyment*, and *Non-Water-Dependent*; and the subcategory of *Nature* with the subdivisions *Permanent* and *Nonpermanent*, was maintained as an issue of concern. It was noted that although the subdivisions of *Permanent* and *Nonpermanent* do not really capture the issue of whether an activity precludes another activity, hopefully these concerns would be captured in one of the other categories.

Fishing

Fishing was identified as an important issue because it could be affected by contaminated sediments, sediment cleanup, navigation activities, and habitat development activities. Some participants urged that the subcategories of *Commercial, Treaty,* and *Recreational* be included. Others noted that there can be conflicts between the various types of fishing and suggested that a potential conflict between subcategories might be avoided if the recreational fishing were addressed under the main *Recreation* category. Others responded that the *Recreation* category is intended to include such things as piers and boat launches (structural items that aid in recreation), while the *Fishing* category is intended to address the use and allocation of fishery resources.

Decision—*Fishing*, with the subcategories of *Commercial, Treaty,* and *Recreational* was maintained as an issue of concern.

Clean Sediment Withdrawal

This issue was added to the list of issues of concern in recognition that clean sediments in Unit 17 are now becoming a sought-after resource.

Sources of Pollution

This issue category is intended to include information about ongoing sources of contamination, rather than historical sediment contamination. This was considered an issue of concern because the presence, absence, or cessation of ongoing sources could influence sediment cleanup and habitat development decisions.

Decision—*Sources of Pollution* with the subcategory of *Types of Sources* and the further subdivisions of *Point*, *Non-Point*, and *Pollutant(s) of Concern*, was maintained

as an issue of concern. The *Pollutant(s) of Concern* subdivision is intended to capture the Co-op's concern that different contaminants (e.g., hydrocarbons, metals, bacteria) may have different impacts and, therefore, may affect different uses, whether they have a point or non-point source.

Land Alteration

This issue category was originally titled *Filling* and had the subcategories of *Aqueous* (i.e., discharging fill material into the aquatic environment while maintaining that aquatic environment) and *Terrestrial* (i.e., filling aquatic land to create dry land). This category was added at the request of DNR, which is particularly concerned about filling that turns aquatic land into dry land, thereby removing areas from the "aquatic land" definition and, as a result, decreasing DNR's land management flexibility.

Other participants suggested that the Co-op is more concerned with aquatic land alteration than simply filling (i.e., dredging and filling are both part of the same program and both alter habitat). Some said that dredging and filling should be kept separate because they differ in terms of how they interact with or impact other issues. It was also noted that there is a difference between maintenance dredging (a periodically repeated activity and an integral part of navigation) and dredging that is intended as a one-time activity specifically to remove contaminated sediments.

Decision—The category title *Filling* was changed to *Land Alteration* and was maintained as an issue of concern. In addition, to help clarify the intent of the Co-op, the subcategories of *Aqueous* and *Terrestrial* were changed to *Fill* (with the subdivisions of *Conversion to Upland* and *Shallowing*) and *Dredge* (with the subdivisions of *Conversion to Aquatic Land* and *Deepening*).

Policy Issues to Be Considered

The Co-op also developed a list of 10 issues that would not (or could not) be directly managed in a long-term management plan, but that were recognized as important and, therefore, appropriate for consideration in the context of the planning process. This second list of issues is referred to as "policy issues to be considered." Issues on this list include such things as cumulative impacts that might be directly addressed in a management plan following significant study and evaluation, and treaty rights. The final list of policy issues to be considered is as follows:

POLICY ISSUES TO BE CONSIDERED

1. Enforcement
2. Jurisdiction
3. Liability (who pays; ongoing risks)
4. Management Flexibility (over the long term)
5. Responsibility (implementation)
   a) Lead
   b) Support
6. Economics
7. Treaty Rights
8. Cumulative Impacts
9. Target Species
10. Aesthetics

COMPATIBILITY AND INCOMPATIBILITY STATEMENTS

The Co-op developed a generic (rather than unit-specific) list of compatibilities and incompatibilities that may exist among the identified issues of concern that could be used as a basis for developing and focusing the content of a management plan for each unit. Because of the short time remaining when this activity was started, these statements were completed for only 3 of the 10 identified issues of concern (i.e., habitat, sediment cleanup, and navigation and commerce). These issues were selected because they were considered to be the most immediate and process-driving issues of concern to the Co-op.

The format used was to place the issue under consideration at the top of a table and then to identify how this issue impacts or is compatible or incompatible with the issues listed down the left hand side of the table. Tables 4–13 present this process for each of the categories considered. For example, Table 4 provides information about how navigation and commerce might impact or be compatible or incompatible with the remaining issues, not how the remaining issues might impact or be incompatible with navigation and commerce (e.g., navigation and commerce impact sediment mining by causing sediment contamination and thereby reducing the supply of clean sediments available for mining, *not* sediment mining impacts navigation and commerce by causing sediment contamination and thereby reducing the supply of navigation and commerce). Similarly, Table 13 provides information about how controlling sources of pollution might impact or be compatible or incompatible with each of the three most immediate issues of concern. (*Sources of Pollution* was changed to *Controlling Sources of Pollution* for this activity in an effort to more accurately capture the intent of this issue.) Key to this activity was identification of the specific element of each issue that was linked to or caused the conflict. This provides a basis for identifying how the conflict might be resolved.

TABLE 4. POSITIVE AND NEGATIVE IMPACTS OF NAVIGATION AND COMMERCE

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Clean Sediment Withdrawal (mining)	Reduces supply (by causing contamination of clean sediments) (−)
	Reduces supply (because it is a government-subsidized activity) (±)
Fishing	Potentially causes vessel/vessel conflicts (−)
	Potentially causes vessel/gear conflicts (−)
	Impacts fishery resources (−)
	Restricts access (due to piers) (−)
	Provides access (fishing piers) (+)
	Promotes fishing (marinas and commercial fishing are commerce activities) (+)
	Provides support facilities (+)
	Promotes environmental awareness (boat builders are concerned) (+)
Habitat	Alters nearshore and shoreline habitat (−)
	Causes vessel wakes/prop wash discharges (−)
	Impacts sediment, water, and air quality (−)
	Causes noise (−)
	Decreases available light (−)
	Impacts habitat through dredging (−)
	Impacts habitat through filling (−)
	Impacted by legal obstruction (preferred use of harbor areas) (−)
	Alters drainage patterns (−)
	Impacts vegetation (−)
	Physically obstructs biotic movement (−)
	Provides funds and opportunities to preserve/enhance habitat (+)
Land Alteration	Defines land type (for example, channels) (−)
	Promotes bulkheads, aprons, rip-rap, finger piers (hard surfaces) (−)
	Promotes land alteration (±)
	Impacted by legal obstruction (restricts filling in harbor area) (±)
	Creates relatively permanent changes (for example, channels) (±)
Public Access	Impacted by physical obstructions (−)
	Impacted by visual obstructions (−)
	Impacted by legal obstructions (−)
	Affects safety (−)
	Creates vessel viewing opportunities (+)
	Provides funds for public access (+)
	Provides for public and private transportation (+)
Recreation	Creates traffic conflicts (−)
	Impacts aesthetics (for example, terminals) (−)
	Results in competition for space (−)
	Impacts water quality and shellfish harvesting (from bilge pumping) (−)
	Causes noise (−)

TABLE 4. (cont.)

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Recreation (cont.)	Affects safety (−)
	Impacted by legal obstructions (−)
	Promotes marine development (+)
	Provides tour boat opportunities (+)
	Creates vessel viewing opportunities (+)
	Provides funds for remedial actions (+)
	Provides public and private transportation (+)
Sediment Cleanup	Limits remedial options (for example, vessels, piers) (−)
	Resuspends contaminated sediments (−)
	Contributes to contamination (−)
	Provides funds for remedial actions (+)
	Provides for incidental cleanups (maintenance dredging) (+)
	Provides a window of opportunity to control sources (for example, through maintenance dredging) (+)
Shoreline Development	Historical use impacts future use (impacted by both physical modifications and remaining contamination) (−)
	Limits shoreline uses (±)
	Encourages water-dependent uses of shoreline (+)
	Focuses water-dependent and industrial uses (+)
Controlling Sources of Pollution	Contributes to contamination from direct and indirect sources (for example, prop wash, spills) (−)
	Difficult to regulate (−)
	Provides funds for source control (+)

TABLE 5. POSITIVE AND NEGATIVE IMPACTS OF HABITAT

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Clean Sediment Withdrawal (mining)	Reduces supply of material (for example, having been designated as habitat) (−) Habitat construction produces a market (or creates a demand) for clean sediments (+) Habitat construction could provide (through removal) clean sediment material for use elsewhere (+)
Fishing	Restricted access to created habitat could likewise restrict access to fishing in the area (−) Creation of habitat for one resource could impact fishery resources and hence fishing (for example, habitat created for heron, which eat fish, could decrease the number of fish available for the fishery) (−) Habitat creation benefits the fish and hence results in better fishing (more fish available) (+)
Land Alteration	Restricts or prohibits nonhabitat land alterations (−) Has potential to further personal interests under guise of habitat creation; habitat as "red herring" for other purposes (for example, a party may say habitat is being created when actually filling in an area for other purposes) (−) Promotes land alteration (in creating habitat) (+)
Navigation and Commerce	Affects vessel navigation (−) Restricts commercial shoreline developments (for example, in areas designated as special habitat) (−) Habitat mitigation requirements increase the cost of navigation-related projects (−) Promotes commerce (tourism, fishing) through habitat creation (+)
Public Access	Restricts access due to potential impacts on resources (−) Promotes access due to desirable environment (+) Allows for more access to be developed as part of habitat creation projects (+) Promotes environmental awareness and education (+)
Recreation	Construction of habitat can displace pre-existing recreation (−) May limit types of feasible or allowable recreation (−) May promote recreational activities (+) Promotes environmental awareness and education (+)
Sediment Cleanup	Increases cost of cleanup (−) Influences method of cleanup (±) Influences cleanup decisions (for example, may decide not to do cleanup if it would destroy an eelgrass bed; may decide to go ahead with cleanup if habitat disruptions would be small and short-term) (±) Expedites cleanup (for example, valuable habitat areas may be a higher priority for cleanup) (+)

TABLE 5. (cont.)

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Shoreline Development	Potentially restricts/inhibits development (−) Influences cost of development (−) Modifies the shoreline (±) May be incorporated into shoreline development plans (+)
Controlling Sources of Pollution	Increases cost of source control (higher cost controls may be required to provide greater level of habitat protection) (−) Influences the level and timing of source control activities (+) Encourages source control (+) Habitat construction provides opportunity to incorporate source controls into habitat project (for example, a vegetated swale created as habitat could also function as a filter for rain water before it is discharged to the bay) (+)

TABLE 6. POSITIVE AND NEGATIVE IMPACTS OF SEDIMENT CLEANUP

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Clean Sediment Withdrawal (mining)	Depletes the resource (when used as capping material) (−) Promotes mining activity (to gather material for use as capping material) (+) Fosters dredging of contaminated sediments to get to clean sediments (i.e., the capping of minimally contaminated sediments makes clean sediments directly under the contaminated sediments unavailable for use as capping material) (+)
Fishing	Impacts fishery resource by physically altering the bottom (−) Directly affects biota during cleanup action (−) Restricts fishing access during cleanup (−) Creates a cleaner environment for fishery resources thereby enhancing the health and survival of the resource (and thus protecting the health of people who eat the fish) (+) Enhances fishing activities (by reducing contamination of the fish, increasing the number of available fish, and allowing areas closed to fishing because of contamination to be reopened) (+)
Habitat	Displaces habitat (−) Improves/enhances the physical character of habitat (+) Reduces the contamination of existing and created habitat (+) By reducing contamination, increases public acceptance/demand for habitat creation (i.e., there is more interest in investing in habitat creation when it will not become recontaminated (+) Provides opportunity to create habitat (+) Reduces the cost of habitat improvements (e.g., habitat projects do not have to fund sediment cleanup and creation of the habitat) (+)
Land Alteration	Amount that parties are willing to spend to clean up sediments may influence the method used; method used may be self-serving (for example, a party may agree to pay $2 million to dredge a contaminated area, but the real intent may be to create a marina at that location) (−) Promotes land alteration (±) Influences type and degree of alteration (±) Sediment removal activities create need for land alteration in the form of a multiuser disposal site (+)
Navigation and Commerce	Influences nature and type of navigation and commerce uses (for example, dredging may allow for deep draft navigation while filling could limit navigation but could create uplands for commercial activities) (±) Influences the cost of navigation and commerce [(−) in the short term associated with cleanup action; (+) in the long term because there would be less contamination and thus less liability for contamination] (±)

TABLE 6. (cont.)

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Public Access	Restricts or changes accessibility (−) Reduces human health impacts possible through exposure to contaminated sediments (+) Provides opportunities for access (+) Increases the demand for access (+)
Recreation	Restricts or changes recreation access (−) Reduces human health impacts possible through exposure to contamination during recreational activities (+) Provides opportunities for recreation access (+) Increases the demand for recreational access (+)
Shoreline Development	Selected method may influence development (for example, nearshore capping may restrict some types of shoreline development while promoting others (±) Influences cost of development (±) Promotes shoreline development (+)
Controlling Sources of Pollution	Influences the cost of source controls (±) Removes sources (+) Influences timing of offsite source control activities (may require that sources that could potentially recontaminate the sediments be controlled before cleanup is done) (+) Improves ability to conduct source tracing (can trace new contamination on clean sediments back to the source more easily than ongoing contamination that is being added to already contaminated sediments) (+)

TABLE 7. POSITIVE AND NEGATIVE IMPACTS OF CLEAN SEDIMENT WITHDRAWAL (MINING)

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Can destroy habitat through excavation (−) Creates short-term impacts (during the process) (−) Can create habitat through excavation (+)
Navigation and Commerce	Causes short-term disruption (during the process) (−) Enhances navigation and commerce (for example, when done as part of navigational maintenance dredging) (+)
Sediment Cleanup	Can influence method and timing of cleanup (for example, if clean sediments from a mining operation are available, the decision might be to cap a contaminated area with that material now; at another time when no clean sediments are readily available, sediment removal may be the selected cleanup method) (±) Can decrease the cost of cleanup (+) Provides a source of capping material (+)

TABLE 8. POSITIVE AND NEGATIVE IMPACTS OF FISHING

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Physically damages habitat (−) Influences location and type of habitat created (±) Influences protection of habitat (+) Funds habitat preservation and enhancement by funding resource management agencies (+)
Navigation and Commerce	Potentially causes vessel/vessel conflicts (−) Potentially causes vessel/gear conflicts (−) Restricts access (due to fishing piers) (−) Influences the siting, type, and size of fishing support facilities and activities (−) Promotes development of commercial activities to support fishery activities (+)
Sediment Cleanup	May influence decision whether to conduct cleanup (±) May influence selected method of cleanup (±) Promotes cleanup of contaminated sediments (+)

TABLE 9. POSITIVE AND NEGATIVE IMPACTS OF LAND ALTERATION

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Alters habitat (±) Provides opportunity to create habitat (+)
Navigation and Commerce	Obstructs navigation during land alteration process (−) Influences type, location, and size of navigation and commerce options (depending on the type of land alteration, navigation and commerce options may be narrowed or broadened) (±) Supports navigation and commerce by physically altering the land (+)
Sediment Cleanup	Provides opportunity for individuals to alter the land for purposes other than cleanup ("red herring") (−) Affects the cost and timing of cleanup activities (−) Fosters opportunity to conduct cleanup (+)

TABLE 10. POSITIVE AND NEGATIVE IMPACTS OF PUBLIC ACCESS

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Degrades habitat value (−) Promotes the need for, design, and location of habitat development (+) Provides the opportunity for habitat development (i.e., habitat development can be incorporated into public access projects) (+)
Navigation and Commerce	Opportunity for, types, and locations of navigation and commerce-related activities may be restricted in areas set aside for public access (−) Increases liability for public safety (−) Promotes navigation and commerce (for example, ferries and tour boats) (+)
Sediment Cleanup	Influences the method and timing of cleanup (−) Promotes the need for cleanup (for example, to protect human health) (+)

TABLE 11. POSITIVE AND NEGATIVE IMPACTS OF RECREATION

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Influences the type and location of habitat created (−) Physically degrades habitat quality (−) Promotes habitat development (+)
Navigation and Commerce	Interferes with navigation and commerce activities (for example, transportation activities) (−) Fosters navigation and commerce through support services (+)
Sediment Cleanup	May influence the design, method, and timing of cleanup activities (±) Fosters the need for cleanup (+)

TABLE 12. POSITIVE AND NEGATIVE IMPACTS OF SHORELINE DEVELOPMENT

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Alters habitat over the short and long term (long-term projects may preclude development of some types of habitat for a very long time) (−) Influences the type, location, and timing of habitat enhancement opportunities (−) Provides funding and opportunities for habitat development (+)
Navigation and Commerce	Alters navigation and commerce options over the short and long term (−) Influences the type, location, and timing of navigation and commerce activities over the short term (during cleanup) and long term (−) Provides funding for navigation and commerce-related facilities and activities (some shoreline developments are directly related to navigation and commerce) (+)
Sediment Cleanup	Influences the type, location, and timing of cleanup activities (−) Provides opportunity for individuals to conduct shoreline development under the guise of sediment cleanup ("red herring") (−) Provides funding for sediment cleanup (+)

TABLE 13. POSITIVE AND NEGATIVE IMPACTS OF CONTROLLING SOURCES OF POLLUTION

Other Issues of Concern	Compatibilities(+)/ Incompatibilities(−)
Habitat	Influences the type, location, and timing of habitat enhancement activities (for example, may have to wait for sources to be adequately controlled before beginning a habitat mitigation project) (−) Provides opportunities and funding to enhance habitats (controlling sources itself enhances habitat quality) (+)
Navigation and Commerce	May restrict the continued performance of highly polluting navigation and commerce activities (−) Causes short-term impacts during construction (−) May remove an area from navigational use (−) Reduces potential liability (reducing the input of pollutants to an area used for navigation and commerce would reduce liability for future cleanup in the area) (+)
Sediment Cleanup	Enhances willingness to clean up the contaminated sediments and will make cleanup more effective (+) Affects the timing of sediment cleanup (for example, cleanup may be postponed until source control measures are in place) (+)

HABITAT, SEDIMENT CLEANUP, AND NAVIGATION AND COMMERCE MAP OVERLAYS

The Co-op developed map overlays to familiarize the participants with the location of present and potential activities and other considerations related to the 10 identified issues of concern, and to graphically illustrate where there might be conflicts among activities. Due to the short time and lack of adequate funding, this exercise was again limited to the identification of potential activities associated with the habitat and sediment cleanup, and other considerations that are important to navigation and commerce. A single map with all overlay information for these three issues is provided in the pocket at the back of this report.

Twenty-one CSO and storm drain outfalls, illustrated in blue, represent areas that are being considered for sediment cleanup. These CSOs and storm drains are intermittent, not continuous, sources of water quality and sediment degradation. Although there is a potential for active sediment cleanup at all of the locations where CSOs (and perhaps storm drains) discharge to the bay and waterway, priority sites will be those identified for cleanup pursuant to the consent decree (12 total). Some participants noted that there are little or no chemistry data available yet for many of the CSOs; thus, it is really speculation at this point to identify areas that will need cleanup. In general, there is thought to be significant contamination in Units 5, 7, 10, 12, and 14, while the contamination is probably less significant in Units 1, 4, 11, and 13. There is less recent information about contamination in units 14–17. However, there are a few discharge pipes in each of these units and previous data generated by EPA, Metro, and the Elliott Bay action program indicate that there are some areas with significant contamination. The area within units 14–17 will, therefore, be considered in the process of identifying areas requiring sediment cleanup.

Representatives from Ecology noted that additional sediment cleanup sites may need to be added to this map once they are identified by Ecology under the authority of the Sediment Management Standards. Also, it was noted that the Elliott Bay/Duwamish River natural resource damage settlement agreement consent decree only addresses contamination linked to storm drains and CSOs; areas contaminated by other sources such as spills are not being considered for cleanup under the consent decree. In addition, participants stated that the area of sediment that will ultimately be actively cleaned up will depend in part on the availability of sediment disposal sites, the feasibility of capping, and, generally, the cost of conducting cleanup activities.

Potential intertidal habitat restoration sites are illustrated in green. These sites were taken largely from an inventory and analysis of potential restoration sites completed for the Port of Seattle and EPA (Tanner 1991). Management objectives pertaining to habitat restoration, illustrated in pink, show areas being considered for intensive and small-scale restoration and areas where existing habitat should be maintained and restoration activities de-emphasized. The habitat management categories were developed by the Co-op (see *Habitat Categories* later in this report). In this process, some participants cautioned that the Co-op needs to recognize that information necessary to identify specific critical

habitat areas is not well developed. Lacking this information, opportunity and a general understanding of habitat potential was relied upon in assigning habitat management objectives to the units.

Finally, the map identifies water depths (in black) and harbor area and waterway lines (in beige), which are important considerations for navigation and commerce. The map currently includes only the navigation lines set by the Harbor Line Commission; it does not include the Port of Seattle or the Corps navigation lines.

Results of this mapping activity in combination with the results of the conflict identification activity mentioned above provide the foundation for the completion of Phase I of the planning process: conflict identification. The Co-op identified a list of specific potential conflicts, presented in Table 14.

Based on Co-op discussions, it appears that the greatest potential conflicts exist between habitat and navigation and commerce in units 4, 8, and 14.

MANAGEMENT STRATEGY STATEMENTS

The Co-op's final activity was to develop draft management strategy statements for each unit. The results of this activity represent a first attempt at developing unit-specific, long-term management strategies to resolve the potential conflicts identified above. Again because of a lack of time and adequate funding, these statements were developed only for the issues of sediment cleanup, habitat, and navigation and commerce. The final statements do not formally resolve any of the potential conflicts identified by the Co-op. The final management strategy statements are set forth in Table 15. Co-op discussions held in developing these statements are summarized below.

During development of the management strategy statements, there was some discussion about how general or specific the statements should be. Most participants agreed that the statements should set forth a general management approach or guidance, not specific implementation techniques. For example, the statements might indicate that the cleanup of contaminated sediments is a priority in a particular unit, but should not go so far as to identify which cleanup options would or would not be allowed.

Some participants suggested that the strategies should include how issues will be addressed, when they will be addressed, and who will address them (i.e., name relevant agencies or parties). Others suggested that the strategies should include objectives and methods (including funding mechanisms) for achieving those objectives. Some participants responded that addressing the issues at this level of detail would require public involvement and compliance with SEPA procedures.

Some participants suggested that the statements should include both a target statement and an objective statement. For example, a habitat target statement might identify a specific action, while a habitat objective statement might address process and, thus, be something

TABLE 14. IDENTIFIED POTENTIAL CONFLICTS BY MANAGEMENT UNIT

Identified Potential Conflicts	Management Unit
None.	1, 9
Cleanup may reduce water depth in the southern part of this unit, thereby potentially affecting use of that location for navigation and commerce.	2
Cleanup may reduce water depth seaward of the inner harbor line, thereby potentially affecting use of the area for navigation and commerce.	3, 6
Cleanup may reduce water depth seaward of the inner harbor line and if large-scale habitat development physically intrudes into harbor areas, it might significantly affect use of the unit for navigation and commerce.	4, 8
Cleanup may reduce water depth seaward of the inner harbor line and habitat development may physically intrude into harbor areas. These activities would potentially affect use of the unit for navigation and commerce.	5, 7
Cleanup may reduce water depth seaward of the inner harbor line and waterway line, thereby potentially affecting use of this unit for navigation and commerce.	10
Cleanup and/or habitat development may reduce water depth seaward of the waterway line, thereby potentially affecting use of the unit for navigation and commerce.	11, 13, 15–17
Cleanup may reduce water depth seaward of the waterway line, thereby potentially affecting use of this unit for navigation and commerce.	12
Cleanup and/or habitat development may reduce water depth seaward of the waterway line, thereby potentially affecting use of this unit for navigation and commerce. Commerce and navigation may intrude into major existing habitat and potential habitat restoration sites.	14

Note: Only conflicts between sediment cleanup, habitat, and navigation and commerce were evaluated.

TABLE 15. MANAGEMENT STRATEGY STATEMENTS

Unit	Cleanup	Habitat	Navigation and Commerce
Unit 1	Continue to monitor conditions under existing programs (PSDDA, PSEP, Metro West Point and Renton projects); low likelihood of remediation due to low sediment chemistry over a large area with few sources	Maintain and/or enhance existing habitat; deep subtidal habitat is presumed to be providing important benefits and not requiring large-scale modification	Maintain open navigation; maintain draft of −80 ft or deeper; intensive use by large and small vessels
Unit 2	Correct sediment contamination based on Sediment Management Standards; low likelihood of remediation due to low sediment chemistry over a large area with a few small sources	Preserve existing habitat; vegetated shallows and beaches provide important habitat benefits	Maintain navigation options in southernmost portion of this unit; no expected navigation and commerce uses in the northern and middle portions of this unit; maintain draft of −50 ft; moderate use at southern end associated with vessel traffic; little or no expected use at northern end and middle portion
Unit 3	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over the area with several major sources	Maintain and/or enhance existing habitat; shoreline development limits existing and potential habitat benefits; mitigation sites and undeveloped shoreline should be expanded and enhanced where possible	Maintain existing water depths seaward of the inner harbor line or a draft of −50 ft; intensive use associated with marina and cargo piers
Unit 4	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to low sediment chemistry over much of the area and high sediment chemistry around a major source	Pursue large-scale habitat restoration or mitigation projects; park shoreline presents significant opportunity for vegetated shallows and beach habitat restoration; habitat restoration proposals need to recognize navigation and commerce uses in this unit	Maintain water depths sufficient to support existing docks and berths; intensive use in deep water at northern end due to grain terminal; little or no expected use along shoreline
Unit 5	Correct sediment contamination based on Sediment Management Standards; high likelihood of remediation due to high sediment chemistry over a large area inshore with many sources	Maintain and/or enhance existing habitat; intensive shoreline development limits existing and potential habitat benefits; opportunities for providing increased habitat attributes should be pursued on a project-specific basis	Maintain existing water depths seaward of inner harbor line or a draft of −30 ft from the inner to outer harbor line and −40 ft beyond outer harbor line; intensive use associated with a variety of vessel sizes and activities
Unit 6	Correct sediment contamination based on Sediment Management Standards; high likelihood of remediation due to high sediment chemistry over a large area inshore and few major sources	Maintain and/or enhance existing habitat; intensive shoreline development limits existing and potential habitat benefits; opportunities for providing increased habitat attributes should be pursued on a project-specific basis	Maintain existing water depths seaward of inner harbor line or a draft of −50 ft; intensive use associated with cargo terminals

TABLE 15. (cont.)

Unit	Cleanup	Habitat	Navigation and Commerce
Unit 7	Correct sediment contamination based on Sediment Management Standards; high likelihood of remediation due to high sediment chemistry over a large area with many sources	Maintain and/or enhance existing habitat; proximity to contamination and intensively developed shoreline limits existing and potential habitat; opportunities for enhancement may be created by remediation activities	Maintain existing water depths seaward of inner harbor line or a draft of −30 ft west of the West Waterway and −40 ft along the north end of Harbor Island; intensive use on Harbor Island and moderate use in the western portion of the unit
Unit 8	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to low sediment chemistry over most of the area and high sediment chemistry only in one area with few sources	Pursue large-scale habitat restoration or mitigation projects; park shoreline presents significant opportunity for vegetated shallows and beach habitat restoration; habitat restoration proposals need to recognize navigation and commerce uses in this unit	Maintain navigation and commerce options in southern portion of this unit; maintain water depths sufficient to support existing navigation and commerce uses; moderate use associated with recreational boat traffic
Unit 9	Correct sediment contamination based on Sediment Management Standards; low likelihood of remediation due to low sediment chemistry over a large area with few sources	Preserve existing habitat; vegetated shallows and beaches provide important habitat benefits	Maintain existing water depths seaward of inner harbor line or stated depths, whichever is needed; little or no expected use
Unit 10	Correct sediment contamination based on Sediment Management Standards; high likelihood of remediation due to high sediment chemistry over a large area with many sources	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions	Maintain existing water depths seaward of inner harbor line or a draft of −50 ft; intensive use associated with cargo terminals
Unit 11	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over a large area with few sources	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions	Maintain existing water depths seaward of inner harbor line or a draft of −40 ft; intensive use associated with vessel traffic
Unit 12	Correct sediment contamination based on Sediment Management Standards; high likelihood of remediation due to high sediment chemistry over a large area with many sources	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions	Maintain existing water depths seaward of inner harbor line or a draft of −50 ft; intensive use associated with cargo terminals
Unit 13	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over a large area with few sources	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions	Maintain existing water depths seaward of inner harbor line or a draft of −40 ft; moderate use associated with the marina and other commercial activities

TABLE 15. (cont.)

Unit	Cleanup	Habitat	Navigation and Commerce
Unit 14	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over most of the area and high sediment chemistry in one area associated with one major source	Pursue large-scale habitat restoration or mitigation projects; existing remnant habitat and conglomeration of potential restoration sites should lead to focused restoration and enhancement activities	Maintain existing water depths seaward of inner harbor line and within waterway lines or a draft of −40 ft; intensive use associated with a variety of vessel sizes and activities; proposed navigation and commerce uses need to be sensitive to existing and proposed habitat
Unit 15	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over most of the area and several small areas of high sediment chemistry associated with several sources	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions between anticipated restoration activities in Units 14 and 17	Maintain existing water depths within waterway lines or a draft of −40 ft; intensive use associated with a variety of vessel sizes and activities
Unit 16	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over most of the area and high sediment chemistry associated with Slips 3 and 4	Pursue connector or pocket habitat restoration or mitigation projects; shoreline development limits restoration opportunities to relatively small-scale projects which could serve important connector functions between anticipated restoration activities in Units 14 and 17	Maintain existing water depths within waterway lines or a draft of −20 ft; intensive use associated with a variety of vessel sizes and activities
Unit 17	Correct sediment contamination based on Sediment Management Standards; moderate likelihood of remediation due to intermediate sediment chemistry over most of the area interspersed with areas of high and low sediment chemistry associated with few sources	Pursue large-scale habitat restoration or mitigation projects; relatively low sediment contamination, position within the system, and conglomeration of existing and potential habitat sites should lead to focused restoration and enhancement activities	Maintain existing water depths within waterway lines or a draft of −15 ft; moderate use associated with smaller vessels and barges

more general like "increase available habitat." The intent of the objective statement would be to identify the importance of habitat (and cleanup, etc.) in one unit relative to habitat (and cleanup, etc.) in another unit. Others again cautioned that this type of statement is moving toward ranking and would probably require public involvement.

Participants also raised the issue of how much flexibility there would be in implementation of the strategy statements if they were adopted as policy at some later date. The participants generally agreed that the language should not be too rigid and that there should be flexibility in their implementation.

To streamline the management strategy statement development activity, participants developed category statements for the sediment cleanup, habitat, and navigation and commerce issues. The intent of this exercise was to develop a limited number of specific statements for each of the three issues that could be assigned to the units (in some cases with modification). The category statements assigned to each unit might then be used to identify the importance of each issue in one unit relative to the other units (e.g., that cleanup is more important in one unit than another). The categories developed are discussed below.

Sediment Cleanup Categories

1. High likelihood of remediation
2. Moderate likelihood of remediation
3. Low likelihood of remediation.

There was some discussion about what criteria would be used to assign these categories to different units or specific sites. Some participants said that adequate information is not currently available to rank cleanup sites and that they were hesitant to prioritize one unit over another for cleanup. It was suggested that these categories should be considered only a first attempt to rank the units against each other with regard to cleanup, based on both the size of the area affected and the level of contamination. Participants also emphasized that these category statements are based on the current understanding of the likelihood that remediation will take place and, thus, a possible change in this likelihood based on future potential contamination is not included.

It was also noted that basing the cleanup categories on the likelihood of cleanup and comparing these categories to the habitat and navigation and commerce categories may be comparing apples to oranges. For example, a unit may be classified high on the navigation and commerce scale (intensive use) and low on the habitat scale (maintain and enhance), but cleanup only addresses the likelihood of cleanup, not actual planned cleanup. Others agreed with this observation, but noted that this is as far as the Co-op can go at this point in categorizing cleanup. Ecology still has much work to do in terms of site identification and ranking.

Habitat Categories

1. Pursue large-scale habitat restoration or mitigation projects
2. Pursue connector or pocket habitat restoration or mitigation projects
3. Maintain and/or enhance existing habitat.

The first category does not necessarily mean that the habitat restoration or mitigation projects would be particularly large in size; rather, it means that intensive habitat restoration or mitigation work would appropriately be located in a unit to which this category is assigned. Such projects may or may not be particularly large in size. Category two recognizes that opportunities for large-scale restoration may not exist in a unit, and that restoration activities should focus on providing connections between habitat areas, or on developing smaller "pockets" of habitat. The third category generally implies a lack of opportunity and/or need for habitat restoration in a unit, such that the focus should be on maintaining or enhancing existing habitat areas rather than promoting intense restoration. For Units 2 and 9, the third category was modified to say that existing habitat should be preserved rather than maintained, in recognition that habitat impacted during some activity (e.g., a sediment cleanup action) should be restored to its condition before the activity took place.

Navigation and Commerce Categories

1. Intensive use
2. Moderate use
3. Little or no expected use.

When completing the strategy statements for Units 4 and 8, a perceived conflict between navigation and commerce and habitat led DNR to the determination that these navigation and commerce use categories are inappropriate. DNR stated that these statements only describe what is going on; they are not goal statements. If a unit is said to have little or no expected navigation and commerce use, it may be assumed (perhaps inappropriately) that all other activities (e.g., habitat development) are acceptable in that unit.

DNR does have some flexibility in implementing its constitutional mandate to reserve harbor areas for navigation and commerce-related activities. Non-navigation and commerce projects may be allowed in harbor areas if otherwise allowed by statute and if project proponents can justify why the project should be located there to the detriment of navigation and commerce concerns. DNR argued that the Co-op participants have not provided a ecological basis for why mitigation sites should be located in particular places, so DNR may have insufficient justification for why habitat projects should be allowed to displace navigation and commerce activities. In the face of scientific uncertainty it is

unlikely that DNR can displace navigation and commerce for habitat on an opportunistic basis only; DNR needs some scientific (ecological) justification.

Others responded that there is not adequate information available to say with the degree of scientific certainty that DNR would seem to require that, for example, Unit 17 is better for habitat than Unit 16. While there is a general understanding of the effects of location within the system on habitat function, it is not possible on a small scale to develop priorities based exclusively on location. Therefore, in developing management strategies for habitat restoration, opportunity was considered along with location and the current understanding of habitat function. During development of Elliott Bay and the Duwamish Estuary, areas were set aside for navigation and commerce uses without consideration of habitat. Now there is a recognition that habitat loss has affected fisheries, and habitat restoration needs to receive a higher priority than it has historically.

In establishing habitat management strategy statements, some members felt that significant compromises had been made without commensurate exchanges by proponents of other categories (i.e., navigation and commerce). These members felt that they had been willing to place a low priority on habitat restoration in many units, focusing habitat restoration activities in a relatively small number of units. Conversely, strategies for other categories were perceived as seeking to maintain the status quo without allowing for intensification in some units with reduced use in others. A comprehensive management strategy would seem to require these exchanges, allowing for increased development in some units, and a corresponding greater focus on habitat restoration in others.

DNR responded that placing habitat on state-owned lands (especially in harbor areas) may be allowed with adequate justification. DNR needs some indication of the environmental benefit that would result. The public benefits of habitat establishment would be weighed against any loss of navigation and commerce opportunities and the circumstances surrounding the choice of state-owned aquatic land for habitat placement. With appropriate justification, DNR would consider favoring habitat over navigation and commerce uses. Because of statute or lease term constraints, this may not always be possible. In the end, DNR agreed to keep the use statements for the purposes of this study process.

Qualifying Statements

In addition to assigning specific sediment cleanup, habitat, and navigation and commerce categories to the 17 management units, qualifying statements (e.g., the severity of sediment contamination, water depths, and vessel draft depth requirements) were also added on a unit-specific basis to provide justification for the categories assigned to the units.

Continuing with the same line of discussion as above, DNR representatives noted that the habitat qualifying statements added to Units 1, 2, and 9 provide some ecological basis for the particular habitat category statement assigned to those units. The qualifying statements added to the other units, on the other hand, provide no ecological basis for the assigned category. Other participants responded that Units 1, 2, and 9 are the only

units that focus on existing habitat features; the qualifying statements for the other units focus on where habitat should be placed in those units.

DNR again stated that in the face of scientific uncertainty, it is hard to make decisions about whether to approve specific projects (habitat development, restoration and mitigation projects). For example, based on the qualifying statement added to habitat in Unit 3, there would be a conflict between habitat and navigation and commerce if someone proposed a large-scale enhancement or mitigation project in that unit that would preclude navigation and commerce uses.

Others countered that the qualifying statements only help to focus the direction of development activities. The statements are only a starting point; a development proponent would have to argue why a project that is inconsistent with the guidance should be allowed to go through. It would be necessary to make case-by-case determinations. This is only a study, and the results of this study can be reviewed by a developer to see how far off a potential project is from the long-term planning focus that the Co-op is evaluating. It is not a question of whether a project will or will not be allowed if it is inconsistent with a management strategy statement; rather, it is a question of how much one will have to work to convince the agencies that it is appropriate to allow that project and the amount of mitigation that may therefore be required. Put another way, it is a matter of determining how high the hill is that will have to be climbed to accomplish a desired development activity, not that the hill cannot be climbed. Also, even if a project is consistent with the strategy statement, that does not mean that the project would get a "rubber stamp" approval.

When completing the navigation and commerce qualifying statements, some concerns were raised about using the same qualifiers for Units 10 through 16. In particular, it was asserted that Unit 14 should be treated differently because large-scale restoration projects are planned within this unit. A statement promoting navigation and commerce activities in Unit 14 sets up a conflict between navigation and commerce and habitat in that unit. If a developer consults the navigation and commerce statements in this document to determine where best to locate a project in the waterway, there will be no indication that habitat has been assigned a higher priority in Unit 14 than in Units 10–13, 15, or 16.

Decision—Statements indicating that there is a greater potential for conflict between activities in Units 4, 8, and 14 should be added to the management strategy statements for these units. As such, the phrase "habitat restoration proposals need to recognize existing navigation and commerce uses in this unit" was added to the habitat statements for Units 4 and 8, and the phrase "proposed navigation and commerce uses need to be sensitive to existing and proposed habitat" was added to the navigation and commerce statement for Unit 14.

Like Units 4, 8, and 14, Unit 17 has been assigned a high priority for habitat. However, it was decided that no comment regarding potential conflicts between navigation and

commerce and habitat is needed for this unit because intense navigation and commerce uses that could conflict with habitat plans in this unit are not anticipated.

EVALUATION OF OUTCOMES

The Co-op's primary goals were to: 1) formulate a model process for developing a management plan or strategy that would be capable of identifying and minimizing or resolving conflicts, and that may be applied in other urban bays; and 2) apply that model process to the Elliott Bay/Duwamish Estuary study area in an effort to identify and reduce conflicts between current and potential activities in these locations.

In general, the Co-op participants were pleased with the model process that was developed. An analysis of the process, including its potential limitations and its success as applied to Elliott Bay and the Duwamish Estuary, is provided in the next chapter. The discussion in this section is limited to an evaluation of the Co-op's outcomes in the Elliott Bay/Duwamish Estuary study area relative to the continuum of possible outcomes set forth in Table 1 in Chapter I.

The Co-op has been successful in familiarizing the participants with the management mandates of the other participants and in identifying issues of fundamental concern to participants. Co-op activities provided a mechanism to identify the types of conflicts that may exist and to develop approaches to conflict resolution. The Co-op also provided a forum for the exchange of information about future planned projects and the identification of areas where potential conflicts between the three most immediate and process-driving issues of concern (habitat, sediment cleanup, and navigation and commerce) appear to be most significant. Participants agree that most, if not all, potential conflicts between these three issues in the study area were identified. However, formal resolution of these potential conflicts was not attained. In addition, this study process did not include the public involvement that would be necessary when developing a formal (or even informal) conflict resolution policy. As such, the Co-op's outcome can be said to fall somewhere near the middle of the continuum set forth in Table 1 in Chapter I.

Some participants had hoped that Co-op activities would result in a "decision document" that could be relied upon when conflicts between uses were identified. Indeed, early Co-op discussions were directed at achieving formal conflict resolution. However, in developing and applying the model process, participants realized that comprehensive planning requires the resolution of significant challenges among parties with diverse interests. The primary reasons why the Co-op was not able to identify and resolve all potential conflicts among activities in Elliott Bay and the Duwamish Estuary include the following:

- Resolution of conflicts among multiple and diverse interests requires a significant commitment of time and money. The Co-op had limited resources available for this study project.

- Some participants were reluctant at this stage to develop a formal long-term management policy, and some participants believed that continued discussion still may not result in final resolution of all issues.
- Many participants believed that it would be appropriate to allow for a period of evaluation of the Co-op's study results, before deciding whether development of a formal management policy would be helpful or necessary.

Although the Co-op activities to date have not resulted in formal resolution of all identified potential conflicts, participants agree that the Co-op's achievements, as summarized in this report, will serve as a valuable reference tool during future planning efforts. In addition, participants agree that the study results demonstrate a commitment by all involved to communicate and perhaps compromise when conflicting plans and uses become evident. Participants decided that at this juncture it would be appropriate to evaluate the results of the study process in the context of their regulatory mandates and re-convene in mid-1993 to evaluate the need to initiate a more formal conflict resolution effort. The value found in the results of this cooperative study process will be used by the participants to elicit support for further study if deemed appropriate.

As the primary initiator of the Co-op effort, DNR provided the following statement regarding the perceived need for and the success of, the Co-op process. DNR also identifies several factors that the agency believes should be included in any similar baywide planning evaluation.

> The Elliott Bay Co-op effort, initiated by the Department in 1992, was done in response to Department concern that an increasing number of individual fills (including habitat restoration, contaminated sediment cleanup and harbor development projects) were being proposed in Elliott Bay and Duwamish River without adequate coordination, planning, and impact evaluation among all of the affected agencies, tribes, and project proponents. The Department was concerned that unplanned piece-meal approval of projects would result in the consumption of public land with no evidence that the public benefit had been served. These benefits include both sustaining long-term ecosystem and economic viability and ensuring access to public lands and the benefits derived therefrom.
>
> The Co-op effort also provided an opportunity to explore how best to accomplish a baywide evaluation so that all parties could reach consensus on the range of issues involved, the degree of conflict, if any, between those issues, and mechanisms for resolution of those conflicts.
>
> At the outset, the Department had hoped that this baywide evaluation would result in a plan with a high degree of site specificity, allowing

it, other agencies, tribes, and project proponents to know in advance the specific locations where specific types of projects should go to best serve the public interest. Due to a lack of adequate funding, time, and information, the group could not develop a site-specific plan. However, it was successful in forging a mutual understanding of the issues involved in Elliott Bay and the Duwamish Estuary, the potential conflicts among uses, and an estimate of the effort needed to undertake this type of baywide evaluation.

The Department believes, however, that the product of the current level of effort represents a major step forward in understanding baywide concerns, limitations, and opportunities. It can be used to identify areas of potential conflict with navigation and commerce and other uses that must be addressed by project proponents through project SEPA compliance and is sufficient for the Department to use as part of a total process to evaluate the degree to which filling of state-owned aquatic land is in the public interest. When more information becomes available concerning the full extent and location of sediment cleanup, habitat restoration needs, timing of source control, and other aquatic-oriented projects in the area, development of a more specific plan which would involve public participation and a programmatic EIS might be considered.

Based on the experience gained in conducting the Elliott Bay Co-op effort, the Department feels that there are certain planning considerations that must be a part of any baywide evaluation that will be used to justify allocation of state-owned aquatic land from multiple use to single use. These elements, developed in concert with the participating agencies and tribes, are:

- Cooperative discussion between agencies, tribes, and other interested entities identifying as accurately as possible a region's current and proposed human uses, natural resource uses, and environmental conditions (including, but not limited to, pollution source control, sediment contamination, habitat mitigation, restoration and enhancement, and navigation and commerce opportunities) as they relate to use (including filling of) aquatic land).

- Documentation of those uses and conditions, as specifically as the information will permit, on a geographic basis.

- Identification of any conflicts between those uses on a geographic basis.

- Identification of ways to deal with those conflicts.

- Informal implementation of a baywide evaluation through resolution by project proponents of the identified conflicts (and any conflicts subsequently identified) in justification for the use of state-owned aquatic land in the location requested relative to other locations in the area. This justification would be accomplished by project SEPA compliance (including public review) and supplementary processes (if necessary).

- If information permits and as appropriate, formal implementation of a baywide evaluation will be conducted with public participation and SEPA compliance.

IV. ANALYSIS AND CONCLUSIONS

This chapter provides a brief analysis of the conflict identification and resolution model process developed by the Co-op, and evaluates the success of the model as applied to the Elliott Bay and Duwamish Estuary study area. Attributes of the model, as well as variables influencing successful implementation, are identified and discussed.

THE MODEL PROCESS

Models which promote conflict resolution within the public policy realm must perform within a variety of planning environments. The most successful models provide a structure which encourages communication and goal consensus among actors with multiple interests. Key variables that will influence the success of such a model include the following:

- The ability of the model to identify participants, uses, and management issues of concern
- The ability of the model to promote communication
- Flexibility of the model in defining possible outcomes and goal achievements
- The commitment of resources to model implementation.

These variables, in relation to the model process developed and applied by the Co-op, are discussed below.

Ability to Identify Participants, Uses, and Management Issues of Concern

The model process developed by the Co-op provides a structured method for identifying all appropriate participants, uses, and management issues of concern.

Participant recruitment is a critical task. Participants bring the technical expertise and the intimate knowledge of their agencies' and governments' interests that is necessary to successfully identify the uses and management issues that should be addressed in the planning area. If all significant players are not brought to the table, not only will the results reflect only a few perspectives, but the transition from group activities to development of a formal document and EIS may be slowed as additional perspectives are integrated into the process. Appropriate recruitment requires an initial identification of the

subject geographic area, a preliminary understanding of the complexity of the management issues and associated potential conflicts, and the number of and diversity of interests that must be considered in the planning process.

Ability to Promote Communication

The model process developed by the Co-op provides a forum for the communication of participant perspectives, authorities, and interests, which in turn promotes cooperation and potentially the resolution of identified conflicts.

The minimum expectation is that a model process will provide a forum for dialogue and information exchange that allows for the identification and discussion of jurisdictional authorities and potential compatibilities and incompatibilities between uses. This information in turn provides a foundation for the identification and discussion of approaches to conflict resolution. Ultimately, a model process should provide a framework for the development of a formal agreement. Under the latter scenario, it becomes a forum for public awareness and education as well.

Flexibility in Outcome and Goal Achievement

A key attribute of this model is its flexibility in defining possible outcomes and goal achievement. First, it allows for a variety of outcomes, ranging from informal information exchange to formal rulemaking. Second, it allows the participants to change their selected outcome at any point in the process.

The initial willingness of participants to opt for a "formal agreement" outcome will generally depend upon their vested interests and the complexity of the planning environment. Participants may exhibit extreme reluctance to enter into any agreements which are perceived to be in conflict with their agency or government's goals, interests, and established policies. Hence, the greatest degree of cooperation can be achieved in when the threat to vested interests is small at the informal exchange level. This cooperative spirit can then be built upon to deal with more complex negotiations. The same is true of the need for public involvement. Informational exchanges do not require public participation, but as more complex issues are negotiated, the public must become more involved.

Commitment of Resources

Successful implementation of any model process requires a commitment in terms of time, funds, and staff. The extent of necessary resources will vary depending on the complexity of the issues addressed, the number of participants, and the diversity of their interests.

Staffing requirements occur at two levels. Typically, one or two agencies might take a lead role in identifying potential participants and determining sources of funding. A second level of commitment of staff resources is required to conduct the meetings and to generate materials, minutes, and reports. Detailed minutes provide an "institutional memory" to which participants can refer as they evaluate possible outcomes and the perspectives of other participants. When multiple parties with diverse interests are participating in the planning process, it may be appropriate to hire an outside facilitator who is experienced in mediating complex policy discussions. The greater the number of uses and potential or actual conflicts among participants, the more advisable is the use of an outside facilitator, whose neutrality will assist participants in attaining a sense of trust and an air of cooperation.

Sole agency or multiple funding and contracting arrangements may be employed. Generally, this sort of process is best served by having more than one agency sponsor the effort which would demonstrate commitment to a shared outcome from the process. The level of funding will influence the range of choices regarding the use of an outside facilitator and the production of meeting materials, minutes, and reports.

The amount of time devoted to the planning process is best determined with reference to participants' expectations and desires regarding a final goal or outcome. Any commitment to a formal policy adoption would require a NEPA/SEPA public comment and review process, while informal discussions about approaches to conflict resolution typically require far less time and public involvement.

THE MODEL APPLIED TO ELLIOTT BAY AND THE DUWAMISH ESTUARY

As discussed in preceding sections of this report, the Co-op was organized with the intent of identifying and minimizing conflicts between activities in Elliott Bay and the Duwamish Estuary over the long term. DNR took the initial lead in identifying participants and presenting a range of outcomes for consideration by the group. There were several funding sources, and initially, an outside facilitator was used. The process began with bi-weekly meetings. As reports were being written, meetings became less frequent. Co-op participants met a total of 12 times from July 13, 1992, to December 8, 1992; from January through March 1993, the Co-op met on a monthly basis to evaluate its accomplishments, prepare for and review drafts of this final report, and determine future activities as a Co-op.

The Co-op's assessment of the application of the model which it developed follows.

The Co-op's Identification of Participants, Uses, and Management Issues of Concern

Participants agreed that the model was successful in its ability to identify appropriate participants and provide for the identification and discussion of uses, management issues of concern, and potential compatibilities and incompatibilities between three of the identified issues of concern.

Co-op participants acknowledged that their achievement has not yet resulted in formal conflict resolution. However, it was also noted that management strategy statements developed for the sediment cleanup, habitat, and navigation and commerce issues may help to resolve identified conflicts. Management strategy statements were developed for only these three issues of concern due to the limited time and money available to the Co-op. These three issues were selected for this evaluation because they were considered by the participants to be the most immediate and process driving issues of concern.

The Ability to Promote Communication

Co-op participants agreed that the model process provided adequate opportunity for open communication, and the exchange of information on authorities and agency and government perspectives was considered valuable.

The Co-op did not use the process as a forum for public awareness and education. Participants did discuss public involvement. However, consensus was not reached regarding the need for a formal agreement. The time and money that would be required for public involvement if this outcome was sought was therefore unnecessary. On the other hand, participants also agreed that this is an evolving process and significant public involvement may be appropriate at a later time if a formal agreement is developed.

A facilitator was hired at the start of the process to mediate Co-op discussions. However, as the meetings progressed, the participants became more comfortable with one another and displayed more of a willingness to cooperate among themselves. Accordingly, midway through the process it was decided that the remaining meetings would be facilitated by DNR.

Although it was decided that a facilitator was not needed, the Co-op did find that the participation of many strong players sometimes made it difficult to reach agreement on what issues should be considered. Participants' vested interests dictated the creation of two lists—one which included topics that were considered appropriate for Co-op discussion, and another, which became known as the "Policy Issues to be Considered" list. This second list includes topics that at least some members believed were outside the purview of the Co-op. Creation of the two lists was considered positive in the sense that the group was able to continue communicating and discussing possible conflict resolution without becoming blocked by disagreements about the propriety of the Co-op discussing certain topics.

Some problems in communications arose due to the lack of shared definitions of terms. The remedy was to prepare a glossary.

Flexibility in Outcome and Goal Achievement

Participants agreed that the flexibility of the model process in defining appropriate outcomes was valuable. At the start of the Co-op process, some participants were striving for formal conflict resolution. However, as time passed it became evident that conflict resolution would not be achieved within the present resource constraints and the present opinion of some participants that such a formal outcome was not necessary.

On the other hand, the Co-op did identify several potential conflicts and was able to develop management strategy statements for three of the ten identified issues of concern. These statements potentially provide a framework for future planning activities. In the interim, the results of the Co-op illustrate that achievement of goals along the continuum of possible outcomes is possible when many and diverse interests must be addressed. In the end, participants agreed that the more "middle of the road" outcome was appropriate so that these results could be evaluated before committing the resources that would be needed to achieve a more formal outcome.

Commitment of Resources

The Co-op participants committed sufficient resources to identify issues of concern, identify potential conflicts that may arise between these issues, and develop management strategy statements for the sediment cleanup, habitat, and navigation and commerce issues of concern. Had consensus been achieved that a formal agreement was needed, additional resources would have had to be sought (and may be sought in the future). In addition, financial support was provided to hire an outside facilitator for the first six meetings; continued support over the 9-month study period was provided only for preparation of materials, minutes, and this report.

Future Co-op activities are dependant on the willingness of the participants to continue to support the process. Participants have agreed to meet at least once more to discuss the usefulness of the Co-op to date and to determine what additional planning efforts might be appropriate.

CONCLUSIONS

The model process was judged successful in terms of providing for the participation of all concerned agencies and governments, and in identifying bay-wide uses and management issues of concern. Participants concluded that the process provides ample opportunity for communication of participants' concerns, authorities, and perspectives within a structure that is conducive to dialogue and information exchange. The flexibility of the

model process in identifying and measuring goal achievement was judged as critical to its success. The continuum of outcomes, ranging from information exchange to formal agreements, enables participants to choose a conservative or more aggressive outcome, and to change their goal as they proceed if appropriate. The positive value of such flexibility in defining and evaluating goal achievement is reinforced by participants' ability to determine, within funding constraints, the group's time line. Even when limited time and resources constrain immediate outcome choices, the value of the information exchange invites continued informal dialogue which can serve both short- and long-term goals.

In addition to the strengths identified above, participants acknowledged implicit and obvious limitations of the model process. A lack of adequate resources poses obvious constraints. The identification of multiple sponsors is time-consuming but less suggestive of a "hidden agenda." It is preferable that the level of funding be sufficient to hire an outside facilitator if needed. Sufficient staff should be devoted to the effort as is necessary to produce meeting materials, minutes, and reports. Getting the process started may require that one or two agencies take the lead in identifying key players. Yet, any misjudgments regarding participant recruitment can have chilling effects on the subsequent identification of issues, development of management strategies, and possibilities for conflict resolution. Certainly, any group organized for the purpose of bay-wide planning may discover other pitfalls, based on the complexity of issues being addressed in their planning area. In that sense, what appears to be another limitation is in fact a strength—the model is sufficiently open to allow for adaptation to varying circumstances.

Ultimately, the success of the model depends upon the attitude and integrity of the participants and the sponsors. The focus of the model process is on the identification, minimization, and/or resolution of conflict on the basis of consensus rather than coercion. A shared sense of mission, mutual respect, and strength in articulating values will ensure that the model process serves its purpose.

As applied to Elliott Bay and the Duwamish Estuary, participants agreed that knowledge of each other's management concerns may enable the agencies to work more constructively with one another in the future. However, beyond this, participants had differing opinions of the success of the Co-op's activities. Most notably, some believed that the final management strategy statements do not go far enough in that they are not "visioning" or forward planning statements. Participants stressed that development of a management plan for Elliott Bay and the Duwamish Estuary *must* address future activities. Such a plan should not be used to simply maintain the status quo.

V. REPORT USES AND FUTURE CO-OP ACTIVITIES

The Co-op participants decided that the planning activities conducted for Elliott Bay and the Duwamish Estuary should be considered a study in order to provide the participants with the opportunity to evaluate the results. These results do not represent new environmental policy and are not binding upon the Co-op participants or members of the general public. In addition, the information provided in this document does not override existing and applicable environmental laws, regulations, and policies. The study results are intended to help familiarize the Co-op participants and the public with the environmental management concerns of the Co-op participants and to be used by participants and the general public as a tool that can be consulted when planning different activities. In particular, it is hoped that this information will enable proprietary and regulatory agencies and local and tribal governments to work together more closely in evaluating proposed projects; inform project proponents of agency concerns, priorities, and plans; and serve as a reference when completing development proposals or permit applications. The agency and organization representatives listed in Appendix A may be contacted, as appropriate, to coordinate activities that fall within the purview of this study.

At the conclusion of the study process, the Co-op participants agreed to evaluate the information gathered thus far as to its usefulness in completing every day activities, and to meet again in mid-1993 to discuss whether any additional Co-op activities are necessary.

Specific possibilities for future Co-op activities, include the following:

- **Continue Same Process**—The Co-op could continue the process of identifying compatibilities and incompatibilities and management strategy statements for the remaining issues of concern.
- **Identify and Seek Resolution of Regulatory Conflicts**—The Co-op might work to reconcile regulatory conflicts.
- **Resolve Identified Conflicts**—The Co-op could try to resolve identified potential conflicts between the habitat, sediment cleanup, and navigation and commerce issues.
- **Address Items on the Issues to be Considered List**—The Co-op could consider whether any of the items on the issues to be considered list (e.g., cumulative impacts) might actually be addressed in the process of developing a management strategy for Elliott Bay and the Duwamish Estuary.

- **Develop a Formal Management Plan**—If adequate funding is available, the Co-op could work to develop a formal management plan that would require significant public involvement and perhaps preparation of an EIS.

Whether additional activities are carried out, the Co-op participants recognize that concerns regarding the management of activities in Elliott Bay and the Duwamish Estuary will vary over time and, thus, any formal or informal Co-op outcome will require updating over the years. As such, the Co-op participants agree to keep communicating as time passes, and might consider selecting and supporting a "keeper of the process." This will be discussed when the Co-op reconvenes in mid-1993. If it is decided that development of a formal plan is appropriate, the requirements of the NEPA/SEPA public review and comment process will be followed.

VI. GLOSSARY

Aquaculture—The culture and/or farming of food fish, shellfish, and other aquatic plants and animals in freshwater, brackish water, or saltwater areas. Aquaculture practices may include, but are not limited to, hatching, seeding or planting, cultivating, feeding, raising, harvesting of planted crops or of natural crops so as to maintain an optimum yield, and processing of aquatic plants or animals.

Aquatic lands—All state-owned tidelands, shorelands, harbor areas, and the beds of navigable waters (RCW 79.90.010) Aquatic lands are part of the public lands of the state of Washington. Included in aquatic lands are public places, waterways, bar islands, avulsively abandoned beds and channels of navigable bodies of water, managed by DNR directly or indirectly, through management agreements with other governmental entities.

Beds of navigable waters—Those submerged lands lying waterward of the line of extreme low tide in navigable tidal waters and waterward of the line of navigability in navigable lakes, rivers, and streams. The term "bedlands" means beds of navigable waters.

Combined sewers—A sewer system that carries both sewage and storm water runoff. Normally, its entire flow goes to a water treatment plant, but during a heavy storm, the storm water volume may be so great as to cause overflows. When this happens, untreated mixtures of storm water and sewage may flow into receiving waters. Storm water runoff may also carry toxic chemicals from industrial areas or streets into the sewer system. (EPA Glossary of Environmental Terms, March 1988, p. 5).

Combined sewer overflow—See Combined Sewers.

Commerce—The exchange of buying and selling of goods and services. As it applies to aquatic land, commerce usually involves transport and a land/water interface.

Cumulative impacts—The impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. (40 CFR § 1508.7, Protection of the Environment, revised 7/1/90).

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 may be routinely done in order to maintain navigation channels that would otherwise fill with sediment and block ship passage. (PSWQA 1991 Puget Sound Water Quality Management Plan, Glossary, p. 314).

Extreme low tide—The line as estimated by the federal government below which it might reasonably be expected that the tide would not ebb. In Puget Sound area generally, this point is estimated by the federal government to be a point in elevation 4.50 ft below the datum plane of mean lower low water (0.0). Along the Pacific Ocean and in the bays fronting thereon and the Strait of Juan de Fuca, the elevation ranges down to a −3.5 ft in several locations.

Fill material—Any material placed in an area to increase the surface elevation.

First class shorelands—The shores of a navigable lake or river belonging to the state not subject to tidal flow, lying between the line of ordinary high water and the line of navigability, or the inner harbor line where established and within or in front of the corporate limits of any city, or within 2 miles thereof upon either side (RCW 79.90.040). These boundary descriptions represent the general rule; however, exceptions do exist. To determine if the shorelands are within 2 miles of the corporate limits of a city, the distance is measured along the shoreline from the intersection of the corporate limit with the shoreline.

First class tidelands—The shores of navigable tidal waters belonging to the state lying within or in front of the corporate limits of any city, or within 1 mile thereof upon either side and between the line of ordinary high tide and the inner harbor line; and within 2 miles of the corporate limits on either side and between the line of ordinary high tide and the line of extreme low tide (RCW 79.90.030). In general, the line of ordinary high tide is the landward boundary. The line of extreme low tide, or the inner harbor line where established, is the waterward boundary. To determine if the tidelands are within 2 miles of the corporate limits of a city, the distance is measured along the shoreline from the intersection of the corporate limit with the shoreline.

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. Habitats naturally occurring within Elliott Bay and the Duwamish Estuary include beaches, wetlands, rocky shores, bottom sediments, intertidal mudflats, and the water itself. (PSWQA 1991 Puget Sound Water Quality Management Plan, Glossary, p. 315).

Habitat creation—Manipulation of a site in order to create habitat functions and values that have not naturally occurred on the site.

Habitat enhancement—The increase in one or more values of all or a portion of an existing habitat by man's activities.

Habitat restoration—To return habitat from a disturbed or totally altered condition to a previously existing natural or altered condition by some action of man; to return to a pre-existing condition.

Harbor area—"The area of navigable waters determined as provided in Section 1 of Article XV of the state Constitution, which shall be forever reserved for landings, wharves, streets and other conveniences of navigation and commerce" (Chapter 79.90 RCW, Aquatic Lands). The harbor area is the area physically located between the inner and outer harbor lines.

Harbor line—Means either or both a) a line (outer harbor line) located and established in navigable waters as provided for in Section 1 of Article XV of the state Constitution beyond which the state shall never sell or lease any rights whatsoever to private persons (RCW 79.90.015), or b) a line (inner harbor line) located and established in navigable waters between the line of ordinary high tide and the outer harbor line, constituting the inner boundary of the harbor area (RCW 79.90.025).

Maintenance dredging—The removal of shoal material from a constructed navigation project.

Mitigation—Includes all of the following: (a) avoiding the impact altogether by not taking a certain action or part of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments (40 CFR § 1508.20, Protection of the Environment, Revised 7/1/90).

Navigability or navigable—A body of water that is capable or susceptible of having been or being used for the transport of useful commerce. The State of Washington considers all bodies of water meandered by government surveyors as navigable unless otherwise declared by a court.

Navigation—The movement of vessels to and from piers and wharves.

Non-water-dependent use—A use that can operate in a location rather than on the waterfront. Examples include, but are not limited to, hotels, condominiums, apartments, restaurants, retail stores, and warehouses not part of a marine terminal or transfer facility (RCW 79.90.465).

Ordinary high tide—The same as mean high tide or the average height of high tide. In Puget Sound, the mean high tide line varies from 10 to 13 ft above the datum plane or mean lower low water (0.0).

Ordinary high water—"The line of permanent upland vegetation along the shores of non-tidal navigable waters. In the absence of vegetation, it is the line of mean high water" (Chapter 332-30-106 WAC, *Aquatic Land Management*). In practice, ordinary high water is determined primarily by an evaluation of plant and soil characteristics along the shoreline.

Public access—Physical public access: Unobstructed access with public use improvements that are available to the general public extending from the land to the ordinary high water mark or to the wetland directly abutting the ordinary high water mark. Includes access to tidelands (marine waters) and to the navigable waters of any water body. **Visual access:** Access with improvements that provide a view of the shoreline or water, but does not allow physical access to the shoreline. **Limited public access (physical or visual):** Restrictions on access that are deemed necessary for the health, safety, or welfare of the public *or* for the protection and maintenance of the particular site. Restrictions may delineate times or allow access to only residents of a certain community or housing tract (the limitation to restrict access may not be based on race, sex, color, creed, or physical disability). **Accessory use:** A use that is demonstrably subordinate and incidental to the principal use and which functionally supports the principal use. Any accessory use might be an office, parking lot, or warehouse needed to support a primary water-oriented use. (Ecology 1990).

Public benefit—All of the citizens of the state may derive a direct benefit from DNR actions in the form of environmental protection, energy and mineral production, utilization of renewable resources, promotion of navigation and commerce by fostering water-dependent uses, encouraging direct public use and access, and generating revenue in a manner consistent with RCW 79.90.455.

Public lands—Lands belonging to or held in trust by the state, which are not devoted to or reserved for a particular use by law, and include state lands, tidelands, shorelands and harbor areas as herein defined and the beds of navigable waters belonging to the state (RCW 79.01.004).

Public tidelands—Tidelands belonging to and held in public trust by the state for the citizens of the state, which are not devoted to or reserved for a particular use by law.

Public trust—Certain state-owned tidelands, shorelands, and all beds of navigable waters are held in trust by the state for all citizens with each citizen having an equal and undivided interest in the land. DNR has the responsibility to manage these lands in the best interest of the general public.

Public use—To be made available daily to the general public on a first-come, first-served basis, and may not be leased to private parties on any more than a day use basis.

Renewable resource—A natural resource that, through natural ecological processes, is capable of renewing itself.

Riparian—Relating to or living or located on the bank of a natural water course, such as a stream, lake, or tidewater.

Second class shorelands—The shores of a navigable lake or river belonging to the state, not subject to tidal flow, lying between the line of ordinary high water and the line of navigability, and more than 2 miles from the corporate limits of any city

(RCW 79.90.045). These boundary definitions represent the general rule; however, exceptions do exist. To determine if shorelands are more than 2 miles from the corporate limits of a city, the distance is measured along the shoreline from the intersection of the corporate limit with the shoreline.

Second class tidelands—The shores of navigable tidal waters belonging to the state, lying outside of and more than 2 miles from the corporate limits of any city and between the line of ordinary high tide and the line of extreme low tide (RCW 79.90.035). In general, the line of ordinary high tide is the landward boundary. The line of extreme low tide is the waterward boundary. To determine if the tidelands are more than 2 miles from the corporate limits of a city, the distance is measured along the shoreline from the intersection of the corporate limit with the shoreline.

Shore—That space of land that is alternately covered and left dry by the rising and falling of the water level of a lake, river, or tidal area.

State-owned aquatic lands—Those aquatic lands and waterways administered by DNR or managed under DNR agreement by a port district. "State-owned aquatic lands" does not include aquatic lands owned in fee by, or withdrawn for the use of, state agencies other than DNR (RCW 79.90.465).

Treaty fishing—Commercial, ceremonial, and subsistence fishing activities conducted by members of federally recognized tribes. Tribes reserved their rights to take fish, including shellfish, through treaties signed by Isaac I. Stevens, governor and superintendent of Indian Affairs for the territory of Washington, on the part of the United States, and chiefs, headmen, and delegates of tribes and bands on the part of tribes and bands occupying lands within what was then known as the Territory of Washington. Actively fishing in Elliott Bay and the Duwamish are members of the Suquamish Tribe of the Port Madison Indian Reservation and the Muckleshoot Tribe, both signators of the Treaty of Point Elliott. (January 22, 1855, 12 Stat., 927. Proclaimed April 11, 1859. Ratified March 8, 1859. See especially Article 5.)

Water-dependent use—Use that cannot logically exist in any location but on the water. Examples include, but are not limited to, waterborne commerce, terminal and transfer facilities, ferry terminals, watercraft sales in conjunction with other water-dependent uses, watercraft construction, repair and maintenance, moorage and launching facilities, aquaculture, log booming, and public fishing piers and parks (RCW 79.90.465).

Waterfront—A parcel of property with upland characteristics, which includes within its boundary a physical interface with the existing shoreline of a body of water.

Water-oriented use—Use that historically has been dependent on a waterfront location, but with existing technology could be located away from the waterfront. Examples include, but are not limited to, wood products manufacturing, watercraft sales, fish processing, petroleum refining, sand and gravel processing, log storage, and house boats (RCW 79.90.465).

Wetlands—Those areas that are inundated or saturated by surface or groundwater 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. Wetlands generally include swamps, marshes, bogs, and similar areas.

VII. REFERENCES

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APPENDIX A

Mailing List—Elliott Bay Cooperative

ELLIOTT BAY COOPERATIVE
Participant/Mailing List

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APPENDIX B

Regulatory Authority Summaries

CONTENTS

LIST OF FIGURES

ACRONYMS AND ABBREVIATIONS

BMP	best management practice
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
the Co-op	Elliott Bay Cooperative
Corps	U.S. Army Corps of Engineers
CSL	sediment cleanup screening level
CSO	combined sewer overflow
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DARP	Damage Assessment and Restoration Program
DNR	Washington Department of Natural Resources
Ecology	Washington Department of Ecology
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
HPA	hydraulics project approval
MCUL	minimum cleanup level
Metro	Municipality of Metropolitan Seattle
MTCA	Model Toxics Control Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRDA	natural resource damage assessment
PSWQA	Puget Sound Water Quality Authority
SCZM	Shorelands and Coastal Zone Management
SEPA	State Environmental Policy Act
SIZ_{max}	sediment impact zone maximum allowable contamination level
SMS	Sediment Management Standards
SQS	sediment quality standards
Suquamish Tribe	The Suquamish Tribe of the Port Madison Indian Reservation
USCG	U.S. Coast Guard
WDF	Washington Department of Fisheries

INTRODUCTION

The Elliott Bay Cooperative (the Co-op) has conducted a study wherein a process that could be used to address and perhaps minimize potential conflicts between activities in urban bays was developed and applied to Elliott Bay and the Duwamish Estuary. The goal would be to develop a management strategy through application of the process that would allow for multiple uses or activities in the bay and estuary by reducing or eliminating conflicts between these uses or activities over the long term. In the study process, the Co-op identified the following activities or uses as the primary "issues of concern" that should be addressed in a long-term management strategy:

- Navigation and commerce (including maintenance dredging) activities
- Recreational activities other than fishing
- Public access (upland and in-water access)
- Habitat preservation and restoration (through management of water and sediment quality and dredge and fill activities)
- Contaminated sediment cleanup (by either capping or dredging)
- Shoreline development activities (including both filling and dredging in the shoreline environment)
- Commercial, treaty, and recreational fishing
- Clean sediment withdrawal (sediment mining)
- Controlling point and nonpoint sources of pollution (of particular concern to habitat preservation and restoration, contaminated sediment cleanup, and recreation)
- Land alterations (in-water filling or dredging, filling of aquatic land to create dry land, dredging of dry land to create aquatic land).

Management responsibilities for and interest in the above uses and activities vary among the 18 Co-op participants (local, state, and federal agencies; Muckleshoot and Suquamish Indian tribes; Port of Seattle; and Boeing). For example, the U.S. Army Corps of Engineers (Corps) has primary permitting authority for dredge and fill activities, but other participants have the authority to review and provide comments on dredge and fill permit applications to assure compliance or compatibility of the proposed activity with other issues (e.g., potential impacts to habitat). Similarly, a primary focus of the natural resource trustee agencies is the preservation and restoration of impacted habitat, while the Corps is concerned about impacts to habitat quality only in the context of issuing dredge and fill permits.

As a first step in the study process, the Co-op participants discussed their management responsibilities or interests in each of the above uses or activities. This appendix summarizes the information provided in the presentations and incorporates information

obtained from a review of the laws, regulations, and policies that the participants rely on when carrying out their management responsibilities. The intent of this appendix is to familiarize the reader with the management responsibilities of the various Co-op participants and to identify possible conflicts and overlaps between the identified management programs.

The information provided in this appendix is limited to the information provided by the Co-op participants either during their presentations to the Co-op or directly to the author.

CITY OF SEATTLE

The City of Seattle is different from other agency participants of the Co-op in that there are many different divisions and operations in city government, and all of the divisions or operations compete with each other for money and a voice in city activities. The City of Seattle is a regulator (e.g., implementing land use codes, land use planning, and the Shorelines Management Act), a utility operator (e.g., operating water, power, sewer, garbage, and solid waste utilities; storm drains; and fire response activities), and a major landowner. The city owns a significant amount of submerged land, some of which is contaminated. The city's land use codes do not specifically address tribal treaty rights.

Sediment Remediation

Sediment capping (for remediation) is classified under Seattle's Shoreline Master Program (SSMP 23.60) as landfill. As such, it must meet the specific standards for landfill (SSMP 23.60.184) and the general development standards (SSMP 23.60.152) that are included in the land use codes in the master program.

The following landfill standard requirements from SSMP 23.60.184 may be most applicable to sediment remediation projects:

- Shoreline fills or cuts are to be designated and located so that there is no significant damage to ecological values or natural resources and so that there is no alteration of local currents or littoral drift creating a hazard to adjacent life, property, or natural resource systems
- Fill material is to be of a quality that will not reduce water quality
- An evaluation of fill projects is to consider such factors as the total water surface reduction, navigation restriction, impediment to water flow and circulation, reduction in water quality, and destruction of habitat
- Fill material shall not be deposited on lands that contain unique, fragile, or ecologically valuable resources

- Incidental landfill that does not create dry land and is necessary for the installation of a utility line intake or outfall may be placed on submerged land if it will not have long-term adverse impacts to water quality, sediment quality, aquatic life, or human health.

General development land use codes (SSMP 23.60.152) that may apply to sediment remediation activities include the following:

- The location, design, construction, and management of all shoreline developments and uses shall protect the quality and quantity of surface and groundwater . . . and shall adhere to the guidelines, policies, standards, and regulations of applicable water quality management programs and regulatory agencies.
- All shoreline developments and uses shall minimize any increases in surface water runoff and control, treat, and release surface water runoff so that receiving water quality and shore properties and features are not adversely affected. Control measures may include . . . dikes, catch basins or settling ponds, interceptor drains, and planted buffers.
- All shoreline developments and uses shall control erosion during project construction and operation.
- All shoreline developments and uses shall be located, designed, constructed, and managed to avoid disturbances of and minimize adverse impacts to fish and wildlife resources, including spawning, nesting, rearing, and habitat areas and migratory routes. Habitat losses shall be replaced in a manner sufficient to assume that there will be no net loss of habitat value. Mitigation shall be monitored and shortcomings replaced.
- All shoreline developments and uses shall be located, designed, constructed, and managed to minimize interference with or adverse impacts to beneficial natural shoreline processes such as water circulation, littoral drift, sand movement, erosion, and accretion.
- All shoreline developments and uses shall be located, designed, constructed, and managed in a manner that minimizes adverse impacts to surrounding land and water uses and is compatible with the affected area.
- All shoreline development shall be located, constructed, and operated so as not to be a hazard to public health and safety.
- All development activities shall be located and designed to minimize or prevent the need for shoreline defense, stabilization measures, and flood protection works such as bulkheads, other bank stabilization, landfills, levees, dikes, groins, jetties, or substantial site regrades.
- Navigation channels shall be kept free of hazardous or obstructing development or uses.

- Submerged public right-of-way standards include that an open channel, unobstructed by vessels or structures for access to and from the water for public navigation and for access to adjacent properties, shall be maintained.

Along most of the shoreline environments in Elliott Bay and some of the Duwamish Estuary, the City of Seattle permits submerged landfills only if done "for wildlife or fisheries . . . mitigation or enhancement" (SSMP 23.60.032). In the Urban Industrial shoreline environment, the designation for the shoreline along most of the Duwamish Estuary, submerged fill is permitted only where necessary for water-dependent or water-related uses (SSMP 23.60.842 D2). Although the connection is less direct, it could be argued that sediment remediation (for habitat enhancement) is itself a water-dependent use.

Sediment remediation projects along shoreline environments that have the more restrictive designations of Conservancy Navigation and Conservancy Preservation require shoreline conditional use approval by the Washington Department of Ecology (Ecology) (SSMP 23.60.034). The purpose of a conditional use permit is to allow greater flexibility in varying the application of the master program use regulations in a manner consistent with state law (WAC 173-14-140). Uses that are specifically prohibited by the master program may not be authorized (WAC 174-14-140(3)). Conditional uses may be authorized if it is demonstrated that the use is consistent with state and local policies, it will not interfere with the normal public use of public shorelines, the site and design of the project is compatible with other permitted uses in the area, the proposed use will cause no unreasonably adverse effects to the shoreline environment, and the public interest suffers no substantial detrimental effects.

After approval (with or without added conditions) at the local level, the permit application is submitted to Ecology, and Ecology can either approve the permit, with or without additional conditions, or deny it. In addition to requiring a state rather than local decision, the conditional use standards consider cumulative impacts of additional requests for like actions in the area (WAC 173-14-140(4)). The shoreline conditional use process is also more time-consuming because an additional 30 days are required for appeal of Ecology's decision.

The City of Seattle is currently reviewing its land use plans for consistency with the Growth Management Act.

Combined Sewer Overflows

The City of Seattle shares responsibility with the Municipality of Metropolitan Seattle (Metro) for the management of combined sewer overflows (CSOs). The city is responsible for 110 CSOs, and most are adequately controlled. The city hopes that two CSOs in the Duwamish River will be controlled to the state standard (one discharge/year)

within a year. The City of Seattle has adopted the King County and Ecology storm water standards.

The city and Metro are considering a joint project to repair (including treatment) the Lake Union and Denny Way CSOs. This project would take over 5 years to complete and could cost as much as $9 billion. By the end of 1993, the City will have controlled the last two City CSOs in the Duwamish River to the state standard of one discharge per year.

The City of Seattle is concerned about what the public puts into the sewer system. The city has no control over what goes in the drain, but is responsible for what is discharged after treatment. The city is taking a broad educational approach to source control by working with the public to increase awareness about drainage issues. In addition, the city's construction ordinances are being rewritten, and source control issues will be addressed.

CITY OF TUKWILA

Like the City of Seattle, the City of Tukwila is different from other agency participants of the Co-op in that the many divisions and operations in city government compete with each other for money and a voice in city activities.

Under the Shorelines Management Act, the City of Tukwila has jurisdiction over shorelines within the city. Tukwila's Shoreline Management Plan is currently being updated with respect to habitats, storm drains, land use, and all other activities that affect shorelines. The City of Sea-Tac discharges into Tukwila's storm drain system, and this activity has been incorporated into the city's Shoreline Management Plan. The city has been taking an inventory of shoreline areas in the city in response to the Growth Management Act. The results of this activity should be complete within months and will be used in the planning and development of shoreline areas. In this regard, the city wants to protect existing water quality and habitat areas and to enhance degraded water quality and habitat areas. Until the City of Tukwila's Shoreline Management Plan is completed, the city is administering King County's plan.

The City of Tukwila has developed storm water basin plans, most of which are quantitative (e.g., address structural controls for release of storm water) rather than qualitative (e.g., address contaminants present in the storm water). The plan for Fostoria Basin, which is being funded by a grant from the Centennial Clean Water Fund, will be completed in 1993. Tukwila hopes to prepare a plan for another basin (as yet undetermined) in 1994. In addition, the city is working on a comprehensive storm water management plan that will contain both qualitative and quantitative elements, which is scheduled for adoption in 1993. The city is also developing a storm water management ordinance that will specify what amounts of contaminants will be allowed in storm water discharges. Tukwila also has in place a land altering ordinance, which addresses environmental impacts associated with construction activities, contains a flood control

zone permit ordinance, and provides a sensitive areas ordinance that includes regulation of wetlands. The city is also working on development standards for storm drainage to be adopted with the comprehensive plan and drainage ordinance in 1993.

In the Tukwila area and the Green and Duwamish rivers basin, several environmental activities are either ongoing or planned. In particular, a Green River Management Agreement, led by an elected executive committee, is in place. The Basin Technical Committee, which is also part of this management agreement, is responsible for making policy, regulatory, and capital improvement decisions along the Duwamish River. The Green River Flood Control District, also part of the agreement, is administered by King County in cooperation with other agencies having jurisdiction in the area. For the past year King County has taxed owners of property in this district. The funds generated by this tax are used for maintenance of existing flood control structures, including some rebuilding of river banks. These funds are not available for storm water control activities. The City of Tukwila is also working with the Corps on flood control activities (Section 205 projects).

There are two planning efforts being conducted by King County that will apply to activities undertaken in the Tukwila area. These include the Green/Duwamish Nonpoint Action Plan, which addresses specific policies for land use on the river, and the Flood and Hazard Reduction Plan. Finally, the City of Tukwila is also involved in fisheries enhancement activities in the Riverton and Southgate creeks. Activities have included working with schools and conducting a fisheries feasibility study.

MUNICIPALITY OF METROPOLITAN SEATTLE

Metro is involved in four major activities that pertain to the Co-op planning effort: 1) operation of wastewater facilities, 2) operation of the areawide water quality agency within King County, 3) areawide source control efforts, and 4) implementation of the Elliott Bay natural resource damage assessment (NRDA) settlement for sediment remediation and habitat development.

Metro was established in 1958 to address sewage pollution in Lake Washington. Metro was charged with developing a plan to clean up Lake Washington and redirect sewage discharges from the lake to Puget Sound. The project resulted in the development of two large sewage treatment plants: one at West Point discharging into Puget Sound and one at Renton discharging into the Duwamish River. The Renton discharge has since been redirected to discharge 10,000 ft offshore and about 600 ft deep into Puget Sound. The West Point treatment plant is currently being upgraded from primary to secondary treatment.

Directing the sewage flow to these two plants not only improved Lake Washington water quality, but also decreased discharges of untreated sewage to Elliott Bay and the Duwamish River. For example, from 1895 to 1969, there were two untreated sewage discharges at Denny Way. In 1969, these were directed to the West Point treatment

plant, and now CSOs discharge untreated sewage to Elliott Bay only when the West Point treatment plant is filled to capacity as a result of rainfall events (approximately 50 times/ year).

Metro is very concerned about water quality and tries to maintain water quality in the context of its sewage treatment and discharge responsibilities. Metro is also active in monitoring other programs to ensure that water quality in areas of concern to Metro is not affected. Although not required to do so, Metro is involved in areawide source control activities aimed at operations that result in small unregulated discharges of toxicants to the sewage system.

Metro's Industrial Pretreatment Program regulates the volume and type of material that large industries are allowed to discharge to the sewage system. Metro does not directly regulate most other discharges to the sewage system, except for ensuring that dischargers are aware of materials that are not allowed. However, Metro is responsible for discharges from its sewage treatment plant facilities and is regulated by Ecology through National Pollutant Discharge Elimination System (NPDES) permitting and Sediment Management Standards (SMS) requirements. Metro, the City of Seattle, and Ecology are working to coordinate their source control activities through the Elliott Bay Integrated Action Plan.

Like the City of Seattle, Metro is responsible for managing CSO discharges. Metro is in the process of controlling the CSOs for which it is responsible. Under a 20-year plan, Metro plans to address 13 marine CSOs, CSOs in the Ship Canal, and CSOs in Lake Washington and Lake Union. Metro's priorities are, first, to provide the highest protection to fresh water environments by eliminating CSO discharges to these areas; second, to minimize or eliminate CSO discharges to the Ship Canal; and third, to control CSO discharges to the Duwamish River and Elliott Bay. The rate of reducing discharges to Elliott Bay has been slowed because discharges to fresh water environments and the Ship Canal are being decreased or eliminated. Metro's 1986 20-year CSO control plan is currently being re-evaluated in light of a new stormwater regulation. Although significant work remains to be done before all CSOs will be adequately controlled, both the volume and toxicity of discharges from CSOs have decreased significantly from the 1950s to the present. Reduced toxicity in CSO discharges is the direct result of Metro's industrial pretreatment program, small quantity generator program, household hazardous waste reduction program, and public education and information efforts.

Metro's and the City of Seattle's CSOs in Elliott Bay and the Duwamish River are the focus of sediment cleanup planning activities resulting from the Elliott Bay NRDA settlement consent decree. It is anticipated that perhaps four to six CSOs may be evaluated and controlled with funds available from this settlement. Sediments affected by discharges from these sources might then be allowed to recover naturally, or they may be considered for restoration projects using settlement funds that are earmarked for habitat-related projects.

PORT OF SEATTLE

Port District development began at the turn of the century to "enhance opportunities for business and commerce . . . ." Under the authority of Chapter 53.04 RCW, port districts may be established for the purposes of acquisition, construction, and operation of harbor improvements, including a variety of transportation, transfer, and terminal facilities. In 1911, the Port of Seattle was established by the voters as a port district with the same geographical boundaries as King County. In 1941, the authority to operate airports and to promote industrial development was added to the powers of port districts.

In 1990, the port adopted the following mission and goal statements:

> The Port of Seattle's primary mission is to be a leader in providing services and facilities to accommodate the transportation of cargo and passengers by air, water, and land, and to provide a home for the fishing industry, to foster regional economic vitality and a quality of life for King County citizens.
>
> The Port will also pursue other opportunities if they enhance its ability to achieve its primary mission or if they preserve scarce land resources—marine or aviation—of unique value for Port purposes.

When evaluating the consistency of proposals with the port's mission, goals, and strategies, the following criteria are considered (Port of Seattle 1991):

- Environmental effects
- Consistency with core businesses
- Effects on regional capacity
- Effects on relationship with other ports, governments, unions, private sector entities, and communities
- Need for port involvement
- Resource requirements (financial, facilities, staff, etc.)
- Financial performance (internal rate of return, net present value, cash flow, bottom line impact)
- Effect on economic vitality of the Port District and the region
- Effect of timing (e.g., will opportunity still be available at a future time).

The Port of Seattle currently operates approximately 345 acres of container terminal facilities and owns or leases a total of approximately 825 acres of shoreline and dry land property in Elliott Bay and the Duwamish River basin (property used by the port also includes a significant amount of submerged land that is leased from the Washington

Department of Natural Resources [DNR]). Around 65,000 to 70,000 linear ft of this total are shoreline areas, about 30,000 ft of which are under apron or pier structures. Port property ownership includes terminal property up to the First Avenue South Bridge and the recently purchased Lockheed property (Terminal 3). In addition, the port owns the bed of the navigation channel along the Duwamish River from Spokane Street to the turning basin. Under the Port Management Agreement, the Port of Seattle will manage aquatic lands that are adjacent to port-owned dry land areas (Port of Seattle 1991).

Work is also ongoing in the area of the grain terminal south of Pier 89 in conjunction with the Suquamish and Muckleshoot Indian tribes to site delayed-release net pens. The port is also rebuilding piers in the northern section of Elliott Bay (e.g., Terminal 91). The port is looking at redevelopment in the downtown area and is working with the tribes and the Washington Department of Fisheries (WDF) to guarantee fish passage in this area and with the tribes to address potential gear-vessel conflicts. The port is also working on storm water NPDES permit activities, including mapping storm drains terminal by terminal. In addition, the port has identified several potential terminal development locations. Each of these proposals would include a public access component. For example, the public access components that were included in the 1986 development of Terminal 5 included placement of a fishing pier, picnic tables, landscaping, a hand boat launch, parking, and signs at Terminal 105 (Port of Seattle 1985).

The port hopes to expand development activities in south Elliott Bay, but is also looking for opportunities to address cleanup, restoration, and development activities in Elliott Bay and the Duwamish Estuary in a more holistic manner. The greatest opportunities for habitat enhancement are in those areas where development is underway, because this is where the money is being invested and long-range planning processes are involved. In the past, most of the port's restoration activities have been conducted to mitigate impacts resulting from port projects. Some restoration activities are being done in cooperation with other agencies or organizations (e.g., the Muckleshoot Indian Tribe). Some current and future port restoration projects (i.e., Coastal America projects at Turning Basin No. 3 and at Terminal 105, and potential NRDA settlement restoration at Kellogg Island) are and will be done for purposes other than individual project mitigation.

KING COUNTY

King County has jurisdiction over only a small portion of the Duwamish River below the head of navigation, but does have an interest in water quality and aquatic habitat issues in the lower Duwamish River and in Elliott Bay.

King County adopted a new water quality ordinance (Ordinance No. 10636) in November 1992. This ordinance prohibits the discharge of any contaminants into surface water, storm drainage systems, groundwater, or Puget Sound (§ 4(A)(1)). Listed contaminants include such things as trash, petroleum products, metals, paints, solvents, pesticides, soaps, etc. (§ 4(A)(1)). These discharges are to be limited through implementation of best management practices (BMPs). The King County Surface Water Division is

currently developing a Storm Water Best Management Practices Manual that will describe the types of regulated activities and BMPs that may be implemented to meet the requirements of the ordinance. In addition to this ordinance, King County requires all new developments of a designated minimum size that discharge storm water to follow the King County Surface Water Design Manual.

King County has also developed a Sensitive Areas Ordinance ". . . to identify environmentally sensitive areas and to supplement the development requirements contained in the various use classifications in the King County Code by providing for additional controls without violating any citizen's constitutional rights" (Section 2, Ordinance No. 9614).

Sensitive areas are defined as ". . . any of those areas of King County which are subject to natural hazards or those lands features which support unique, fragile, or valuable natural resources including fishes, wildlife and other organisms and their habitat and such resources which, in their natural state carry, hold or purify water" (Section 64, Ordinance No. 9614). Streams and wetlands are included in the list of identified sensitive areas that require protection. In describing why streams and wetlands are defined as sensitive areas, and hence subject to regulation, the ordinance states "wetlands and streams are environmentally sensitive and serve numerous natural functions and values which are critical. These functions include wildlife and fisheries habitat, water quality protection, flood protection, shoreline stabilization, stream flow, and groundwater recharge and discharge. In many situations these functions cannot be adequately replicated or replaced" (preamble, Ordinance No. 9614).

With some exceptions, the Sensitive Areas Ordinance states that if a proposed development could have probable significant adverse impacts on sensitive areas, the project applicant is required to submit such special studies as are required by King County to adequately evaluate the proposal and all probable impacts (Section 5[A], Ordinance No. 9614). Development proposals are defined in the ordinance as ". . . any of the activities relating to the use and/or development of land requiring a permit or approval from King County (e.g., shoreline substantial development activities)" (Section 32, Ordinance 9614). The special studies are to ". . . identify and characterize any sensitive areas as a part of the larger development proposal site, assess any hazards to the proposed development, assess impacts of the development proposal on any sensitive areas on or adjacent to the development proposal site, and assess the impacts of any alteration proposed for a sensitive area. Studies shall propose adequate mitigation, maintenance and monitoring plans and bonding measures. Sensitive area special studies shall include a scale map of the development proposal site and a written report" (Section 5[D], Ordinance No. 9614). Sections 89-92 set forth the specific requirements that development proposals on sites containing wetlands must meet.

The Sensitive Areas Ordinance sets out the following specific mitigation policy (Section 15, Ordinance No. 9614):

A. "Mitigation" means the use of the following actions that are listed in descending order of preference:

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

2. Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology or by taking affirmative steps to avoid or reduce impact

3. Rectifying the impact by repairing, rehabilitating, or restoring the affected sensitive areas

4. Reducing or eliminating the impact over time by prevention and maintenance operations during the life of the action

5. Compensating for the impact by replacing, enhancing, or providing substitute sensitive areas and environments

6. Monitoring the impact and taking appropriate corrective measures.

B. It is the goal of King County to achieve no overall net loss of wetlands and streams functions and values and to measure the quantity and quality of the wetlands and streams resource base.

C. Mitigation measures shall be in place to protect sensitive areas and buffer zones from alterations occurring on all or portions of the site that are being developed.

D. A mitigation plan shall be required for the design, implementation, maintenance, and monitoring of mitigation.

Section 92 indicates that the mitigation policy should first be followed when a project proposal might impact wetlands. Beyond the mitigation policy, restoration of wetlands is required when a wetland or its buffer zone has been altered in violation of this ordinance, and minimum performance standards are provided (Section 92[B], Ordinance No. 9614). This section also describes when replacement or enhancement would be required, and again provides minimum performance standards. Section 96 provides similar information for restoration, replacement, and enhancement of streams.

Finally, Section 97 regulates the ". . . clearing and removal of vegetation, excavation, grading and earthwork construction including cuts and fills, gravel pits, dumping, quarrying and mining operations within King County. . . ." Fill is defined as ". . . a deposit of earth material placed by mechanical means" and earth material is defined as ". . . any rock, natural soil or any combination thereof" (Section 97, Ordinance No. 9614). The intent of this section is, in part, to minimize adverse storm water

impacts generated by the removal of vegetation and alteration of landforms, to protect water quality from the adverse impacts associated with erosion and sedimentation; and to minimize aquatic and terrestrial wildlife habitat loss caused by removal of vegetation (Section 97, Ordinance 9614).

In addition to the above responsibilities and concerns, King County requires issuance of a permit under the local Shoreline Master Program for development or construction within the shoreline area.

PUGET SOUND WATER QUALITY AUTHORITY

The legislation creating the Puget Sound Water Quality Authority (PSWQA) in 1985 required PSWQA to "prepare and adopt a comprehensive Puget Sound water quality management plan . . ." (RCW 90.70.055). Although the plan is required to focus primarily on the protection and preservation of water quality in Puget Sound, protection and preservation of fish habitat are addressed as well. The underlying assumption driving the creation of PSWQA and the plan is that it will cost far more to clean up pollution later than to prevent it now.

The Puget Sound Water Quality Management Plan was adopted in December 1986 and is reviewed and revised every 2 years as required by RCW 90.70.055(3). The stated goal of the plan is as follows:

> 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 water, sediments, and shorelines of Puget Sound.

To achieve this goal, federal and state agencies and local and tribal governments are to 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 is based on the premise of shared responsibility among all agencies in the Puget Sound region and recognizes that fish, wildlife, water, and pollutants cross jurisdictional lines. The plan establishes a framework based on partnership among levels of government, each having a defined set of responsibilities in different program areas. The plan also recognizes and includes actions by federal, state, local, and tribal governments; private industry; and citizens.

The plan identifies specific goals with respect to many state agency programs including sediment, habitat, storm water, shellfish, and wetland programs. The goals for these particular programs are as follows:

- **Sediments Program Goal**—To ultimately reduce and 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. The plan specifically directs Ecology to develop sediment standards, guidelines for evaluating whether sediments exceed the sediment standards, and a decision process for managing sediment contamination. The SMS were developed pursuant to this directive.

- **Habitat 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.

- **Storm Water Program Goal**—To protect shellfish beds, fish habitat, and other resources, to prevent the contamination of sediments from urban runoff and CSOs, and to achieve standards for water and sediment quality by reducing (to the maximum extent practicable) pollutant discharges from storm water and CSOs throughout Puget Sound.

- **Shellfish 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.

- **Wetlands 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 (PSWQA 1986).

The plan also addresses such issues as nonpoint source pollution, municipal and industrial discharges, and spill prevention and response. The plan addresses some issues comprehensively (e.g., all sources), but then identifies a more limited target approach (e.g., address sources bay by bay). The plan focuses on geographical areas to educate the public and create public support for cleanup, source control, and other activities within each area.

PSWQA is responsible for overseeing and implementation of the plan's requirements by the various affected resource agencies.

WASHINGTON DEPARTMENT OF ECOLOGY

Ecology is responsible for regulating and managing several activities that are relevant to the Elliott Bay planning effort. Ecology's primary responsibilities in this regard are discussed in this section.

Water Quality Management

Under the delegated authority from the U.S. Environmental Protection Agency (EPA), Ecology regulates point source discharges into the state's surface waters through the NPDES permit process (33 USC § 1342). NPDES permits are required for facility wastewater discharges, discharges from municipal wastewater treatment plants, and more diffuse discharges such as sandblasting waste from ship repair facilities. Under the NPDES program, EPA has established effluent guidelines requiring the application of the best practicable control technologies currently available for categories of sources and specific numerical concentration limits for some contaminants. More strict effluent standards may be required if the established standards are not sufficient to meet state water quality standards.

A water quality certification, issued by Ecology, is required of any applicant for a federal license or permit to conduct any activity that may result in any discharge to surface waters of the state. The state issues a water quality certification if it is determined that the discharge complies with the discharge requirements of federal law and the aquatic protection requirements of state law.

Elliott Bay Action Program

The focus of Ecology's Elliott Bay Action Program is to identify and prioritize areas that continue to be contaminated by ongoing sources and then to control those sources. This program does not have its own set of regulations; instead, existing regulations that apply to source control activities are used. Large sources are controlled through the NPDES permit process, and smaller sources are controlled through the implementation of BMPs (using the City of Seattle's BMP policy). Source control efforts for the Harbor Island and South 96th Street priority areas (as identified in the 1988 Elliott Bay Action Plan) should be complete in the near future, and the plan now needs to be updated to reprioritize the remaining sources and to identify new priority sources that should be addressed. Source control efforts in the next phase of the Elliott Bay Action Program could focus on the identification of ongoing sources and the implementation of source control activities in areas selected by the Co-op for restoration.

Contaminated Sediment Management

The State of Washington adopted regulations for managing contaminated sediments (SMS [Chapter 173-204 WAC]) in April 1991. Ecology's Sediment Management Unit has primary responsibility for implementing these regulations. The authority to develop the SMS came from the Puget Sound Water Quality Authority Act and the Puget Sound Water Quality Management Plan developed pursuant to this act.

The SMS set forth narrative, chemical, and biological criteria that define when sediments are considered contaminated. The SMS are used in activities to control sources of contamination; in identifying, ranking, and prioritizing contaminated sediment cleanup sites; and in defining required cleanup levels. The SMS are to be considered during NPDES permit application reviews, water quality certification activities, and sediment cleanup activities conducted under the Model Toxics Control Act (MTCA) (RCW 70.105(D)), the Washington State Water Pollution Control Act (RCW 90.48), or the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 USC §§ 9601-9675). In addition, the SMS are considered applicable or relevant and appropriate requirements at federal sites in Washington that are cleaned up under CERCLA.

The SMS set forth a range of sediment chemical contaminant and biological effects levels that are to be considered in source control and sediment cleanup activities. The lower end of the range defines the goal for the chemical and biological quality of sediments in Puget Sound over the long term (sediment quality standards [SQS]). The higher end of the range defines the maximum chemical contaminant and biological effects levels that will be allowed to result from ongoing discharges after source controls are in place (the sediment impact zone maximum allowable contamination level [SIZ_{max}]) or after cleanup of contaminated sediments is complete (minimum cleanup level [MCUL]). These criteria are also used to define the maximum degree of sediment contamination allowed before active cleanup may be required (sediment cleanup screening level [CSL]) and when dredged material will require confined disposal. The relationship of the SQS to the SIZ_{max}, MCUL, and CSL is shown in Figure B-1.

The SMS also add a 10-year time component that must be considered when selecting sites for cleanup and defining site cleanup levels. This component was added to recognize that sediment quality will improve naturally with time once sources of contamination are controlled. In all cases, the goal is to clean up a site to the current SQS. The maximum cleanup level that would be allowed is the MCUL after a maximum of 10 years of natural recovery following completion of cleanup. Required cleanup levels within this range (SQS now to the MCUL 10 years after cleanup) are selected on a site-specific basis, taking into consideration the net environmental effects (including the potential for natural recovery of the sediments over time) and the cost and engineering feasibility of different cleanup alternatives. In addition, the cleanup standards for a site may vary for different locations within a site. For example, Ecology may require a navigation lane to be cleaned up to the SQS, while requiring that eelgrass beds and areas under piers be left to recover naturally. In this case, remediating contaminated sediments in the eelgrass

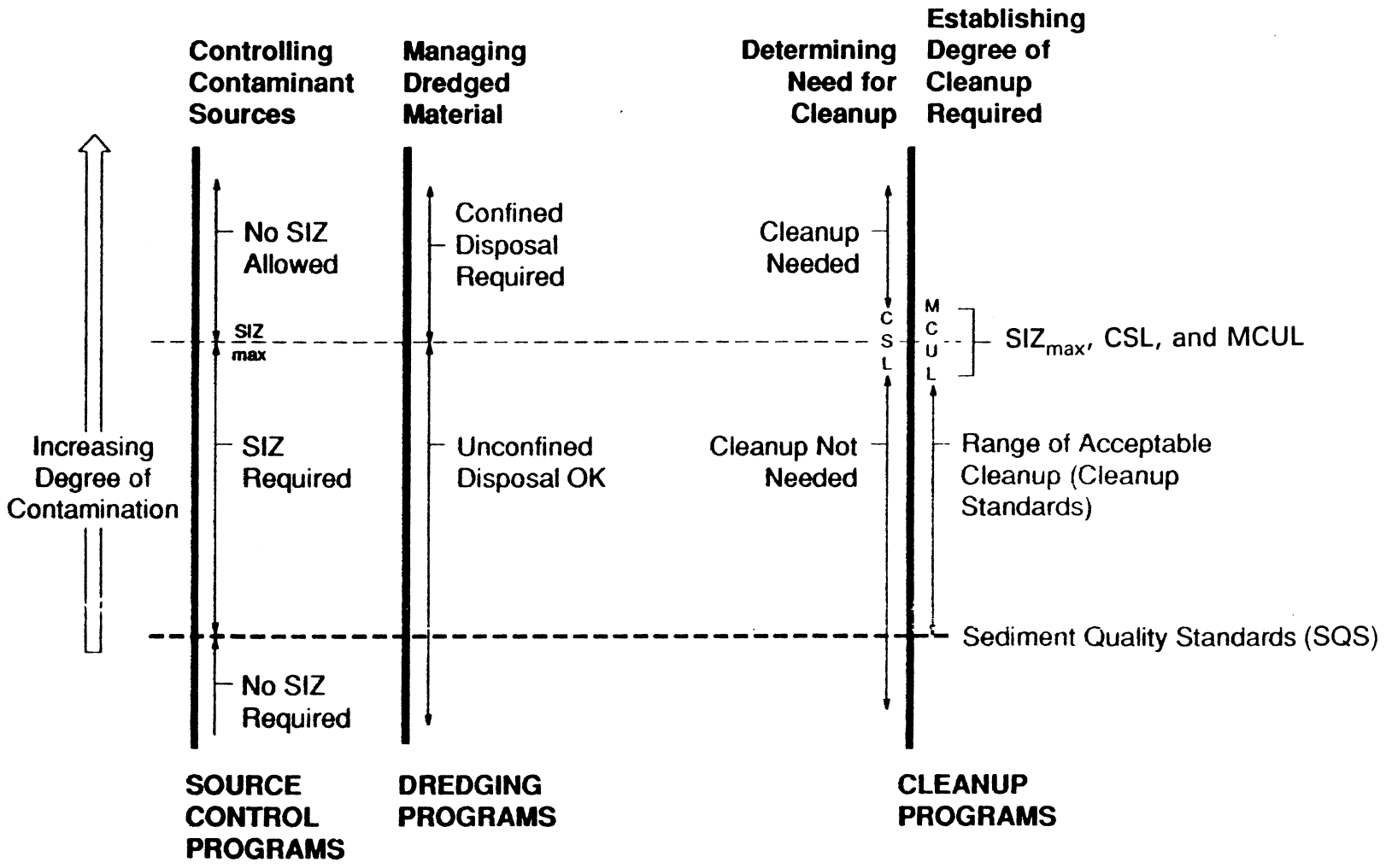


Figure B-1. Schematic relationship of the SQS to the SIZ_{max}, CSL, and MCUL.

beds could destroy important habitat, while remediation under the piers might be prohibitively expensive.

An environmental impact statement (EIS) is required under the State Environmental Policy Act (SEPA) (or an equivalent evaluation under CERCLA) for proposals to remediate contaminated sediments. The SMS also require that a cleanup study be done before remediating a site to identify what the cleanup requirements will be. Information gathered during a cleanup study includes such things as the hazards associated with the site, the level of contamination present at the site, and the type of cleanup action proposed. Before conducting any remedial activities, owners of sediments that are being remediated or that may be affected by remedial activities must be notified.

In some cases, cleanup may need to be conducted prior to completion of source control activities because of liability concerns. Ecology cannot tell a landowner to wait to clean up sediments until a neighboring source is controlled. The tradeoffs between cleaning up now vs. waiting for sources to be controlled must be considered on a case-by-case basis. For example, is it worth cleaning up a site now for the habitat that it would provide over the short term before becoming recontaminated 10 years from now?

Ecology is currently identifying and ranking sites. Data from sediment stations are being reviewed, and efforts are underway to define sites. The types and concentrations of chemicals at sampling stations are being considered in defining sites. Stations near one another that have the same chemicals in similar concentrations are being clustered together to define sites. Sites will be ranked according to ecological and human health hazards. The target date for completion of this exercise is September 1993.

Shorelands and Coastal Zone Management Program

The Shorelands and Coastal Zone Management (SCZM) Program reflects broad concerns regarding wetlands, shellfish habitat, water quality, and public access to the shorelines. Under this program, Ecology is responsible for implementing the state's federally approved Coastal Zone Management Program developed under the authority of the Coastal Zone Management Act (CZMA) (16 USC §§ 1451-1464). According to CZMA, coastal zone management programs should, among other things, provide for "protection of natural resources, including wetlands, floodplains, estuaries, beaches, dunes . . . and fish and wildlife and their habitat, within the coastal zone" (16 USC § 1452(2)(A)) and "the management of coastal development. . ." (16 USC § 1452(2)(B)). Local governments then develop and are responsible for implementing local master programs that are consistent with the state-approved program.

CZMA was amended in 1990 to include a section addressing coastal water quality. Once implementation guidelines are developed by the federal government, the state will have to update the Coastal Zone Management Program to include nonpoint source pollution management measures aimed at restoring and protecting coastal waters. Section 6217(b) of CZMA requires that the state program update provide, among other things, a process

for identifying land uses that may contribute to the degradation of coastal waters and a process for identifying critical coastal areas within which new land uses or substantial expansion of existing land uses would be subject to management measures intended to achieve and maintain water quality standards and to protect designated uses. It is not known at this time when the implementation guidance will be complete.

The SCZM program reviews all locally approved shoreline permits for consistency with the state Shoreline Management Act, including local master programs, and takes final action on shoreline conditional use and variance permits. All proposed amendments to local shoreline master programs must also be reviewed and approved by Ecology.

A certification of consistency with Washington's Coastal Zone Management Program is required for Corps-authorized projects and other federally licensed or permitted projects. The SCZM program reviews proposed projects (including shoreline permits issued by local governments) for consistency with state environmental requirements, including the state Coastal Zone Management Program and local shoreline master programs. If a proposed project is consistent with state environmental requirements, Ecology issues the certification. Ecology's Environmental Review Section responds to the Corps regarding project certification. The SCZM program responds directly to all other federal agencies concerning consistency determinations.

State Natural Resource Trustee Responsibilities

Ecology is the prime state agency (though other agencies may have some responsibilities as well) with natural resource trustee responsibilities. Ecology is responsible for identifying impacted resources and the responsible parties, recovering damages from the responsible parties, and restoring the impacted resources.

WASHINGTON DEPARTMENT OF FISHERIES

In general, WDF and other resource agencies manage for habitat, not particular species. The underlying assumption is that it is best to restore habitat as closely as possible to the habitat present before its alteration, with an emphasis on restoring habitat most limiting to target species' needs. Addressing target species' needs in turn meets the needs of the aquatic community.

WDF is primarily concerned with the management of fisheries habitat. The habitat management policy has the following four components:

- Preserve, protect, perpetuate, and manage food fish and shellfish in state waters
- Seek a net gain of habitat productive capacity
- Emphasize habitat values over populations

- Encourage mitigation that emphasizes replacement of natural values over artificial compensation.

WDF has a "no net loss/net gain" strategy for managing habitat. The primary goal of the habitat policy and this management strategy is to manage habitat in the following order of priorities: 1) maintain current habitat capacity, 2) restore degraded habitat capacity, 3) enhance existing habitat capacity, and 3) develop new habitat capacity. The primary regulatory authorities relied on to enforce the habitat management policy include the Fisheries Code (RCW 75.20 et. seq.), the Hydraulics Code (WAC 220-110 et. seq.), and SEPA review responsibilities.

Under the Hydraulics Code, WDF issues permits (jointly with the Washington Department of Wildlife) for work within the ordinary high water mark, which will use, divert, obstruct, or change the natural flow or bed. The Hydraulics Code does not require public involvement in the review of hydraulics project approval (HPA) permit applications. In addition, HPA permits can be issued without SEPA review.

WDF has the authority to place conditions on or deny HPA permits only for the protection of fish life. If fish could be affected, an HPA permit may be approved with conditions (e.g., the work may not be done at the time of year when juvenile salmonids are passing through, or silting must be minimized). For Elliott Bay in particular, salmon, herring, ling cod, smelt, shellfish, eelgrass, and other resources would be considered when deciding the conditions to be placed on an HPA permit.

When evaluating a permit application, WDF considers mitigation for the proposed project in the following sequence: avoid damage; minimize unavoidable damage; replace damaged capacity (from in-place, in-kind to out-of-place, out-of-kind); and, finally, oppose the project. WDF does oppose projects when satisfactory mitigation is not possible.

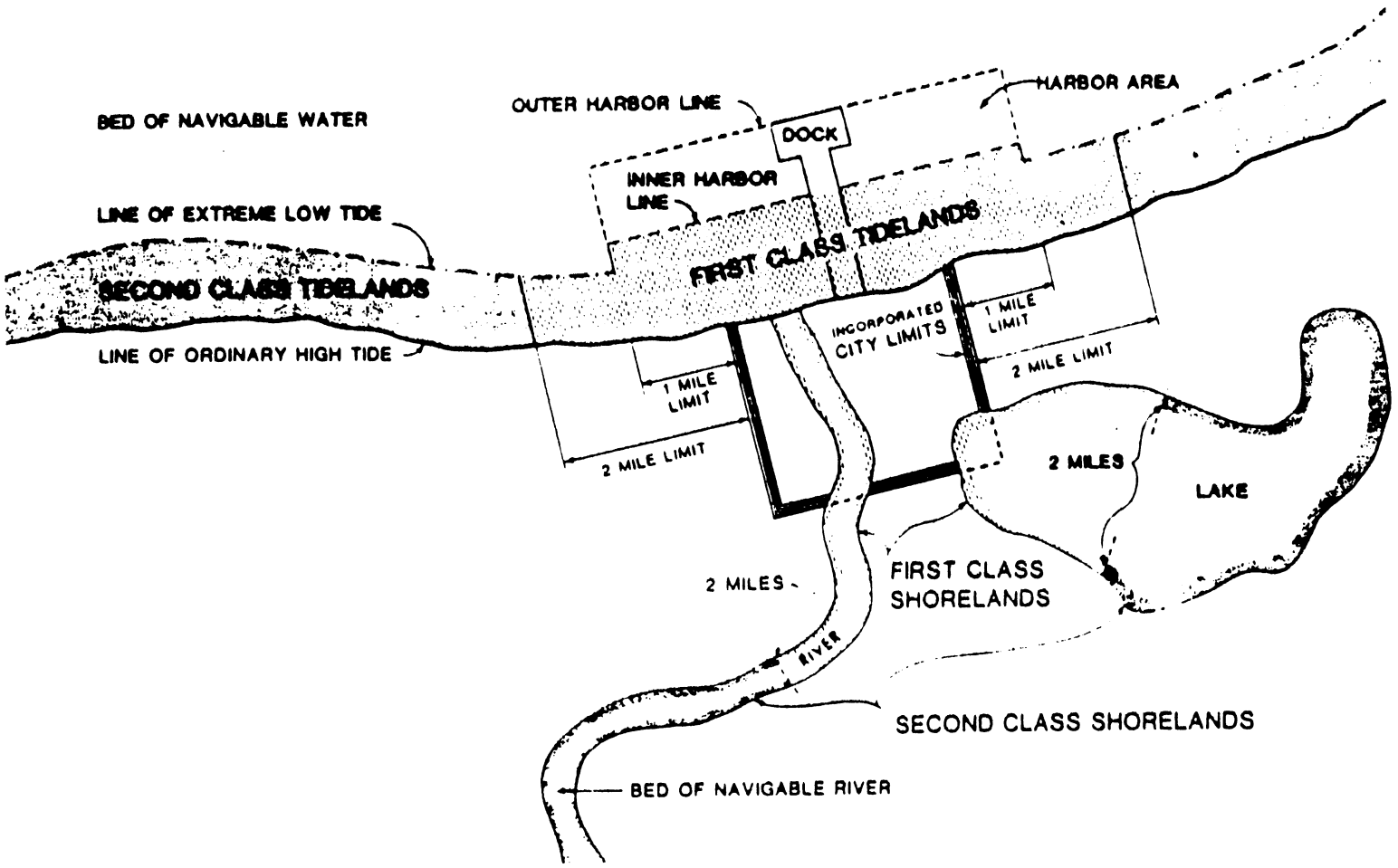
With specific reference to habitat restoration activities in Elliott Bay, WDF is primarily concerned with nearshore habitat for juvenile salmonid feeding, migration, and rearing. Habitat restoration projects should strive to ameliorate past losses, enhance early marine survival, and provide secondary benefits to other marine species. Consistent with the agency's "no net loss/net gain" strategy, the goals for nearshore habitat restoration in the bay are to retain and enhance existing habitat, to restore lost habitat, and to create new habitat. The mechanisms for achieving these goals include adhering to agency habitat management policies, cooperating with other authorities, using an integrated planned approach, controlling sources of contamination, scattering the cumulative effects of cleanup (e.g., getting the public involved), and avoiding further habitat loss. WDF is currently evaluating the impacts of nearshore contained disposal and over-water structures on nearshore habitat.

DNR was created in 1957. The state, through DNR, owns over 2 million acres of aquatic land (both marine and fresh water) statewide. "Aquatic lands" is defined in the aquatic lands section of the public lands statute (Title 79, Chapter 79.90 RCW) as "all state-owned tidelands, shorelands, harbor areas, and the bed of navigable waters" (RCW 79.90.010). State-owned aquatic lands include approximately 1,300 miles of tidelands, 6,700 acres of constitutionally established harbor areas, and all of the submerged land below extreme low tide (including some 2,000 mi^2 of marine beds of navigation and an undetermined amount of freshwater shoreland and beds) (WAC 332-30-100). A diagram illustrating DNR's aquatic lands is shown in Figure B-2.

Submerged lands are held by the state in trust for the benefit of the people of the state and may not be sold or otherwise alienated by the state except in a manner that promotes the public interest. With the exception of second-class shorelands on lakes, the sale of state-owned aquatic lands has been prohibited since 1971. Second-class shorelands are defined in RCW 79.90.045 as ". . . the shores of a navigable lake or river belonging to the state, not subject to tidal flow, lying between the line of ordinary high water and the line of navigability, and more than two miles from the corporate limits of any city." By WAC 332-30-119 of the aquatic lands management regulations, these shorelands may be sold to private owners of abutting upland property if it is determined that the shorelands have minimal public value for uses such as providing access, recreation, or other public benefit.

Prior to 1971, a significant amount of tideland/shoreland area outside of harbor areas was sold. The sale of tideland/shoreland in harbor areas and bedland has never been allowed. According to the state constitution, harbor areas are to be "forever reserved for landings, wharves, streets and other conveniences of navigation and commerce" (Article XV, Washington State Constitution; RCW 79.90.020). Harbor areas are bounded by the outer harbor line (the waterward line beyond which the state may never sell or lease any rights whatever to private persons; RCW 79.90.015) and the inner harbor line (the landward line located between the line of ordinary high tide or ordinary high water and the outer harbor line; RCW 79.90.025). Harbor lines are established by the Harbor Line Commission, and harbor area boundaries may change as needed to meet the needs of navigation and commerce (WAC 332-30-116, Chapter 79.92 RCW). DNR also leases tidelands and bedlands for various purposes. DNR maintains public trust responsibilities on submerged lands that have been sold or are leased. Lease payments are used to fund the cost of managing the leased property and to fund public access projects.

Washington has no well-developed case law to rely on when evaluating what uses of submerged lands meet the requirements of the public trust doctrine (i.e., determining what uses promote the public interest). Following the constitutional requirement that harbor areas be reserved for "conveniences of navigation and commerce," it is DNR's policy that these areas be used for navigation and commerce activities. However, the phrase "navigation and commerce" does not necessarily mean that the only allowable activities are those related to cargo vessels; the interpretation of activities allowable in



Source: DNR. 1984. Draft Aquatic Land Policy Plan.

Figure B-2. Schematic diagram of DNR aquatic lands.

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harbor areas has changed over time. In addition, DNR has other public trust responsibilities that may allow for some flexibility in defining allowable uses of state-owned submerged lands. In particular, DNR is to provide a balance of public benefits, including encouraging direct public use and access, fostering water-dependent uses, ensuring environmental protection, and utilizing renewable resources (RCW 79.90.455).

DNR is currently struggling with pressures to allow state-owned lands in harbor areas to be used for multiple uses. It is DNR's priority to manage submerged lands in a manner that will maintain long-term ecosystem viability while allowing water-dependent economic activities to occur. DNR now wants to approve leases for shorter periods of time than those allowed in the past, so that the appropriateness of the leased activities may be evaluated more frequently.

Because of the perceived flexibility in defining allowable uses of state-owned submerged lands, the increased visibility and implementation of CERCLA and MTCA requirements, and increased involvement of trustees in NRDA and restoration activities, habitat mitigation in particular has become an issue of concern for DNR. First, DNR does not like to approve projects that decrease DNR's flexibility in managing submerged lands over the long term and habitat mitigation projects are generally intended to last forever or at least for a long period of time.

In addition, habitat mitigation is not a "preferred use" for harbor area aquatic lands. However, DNR may approve clearly non-navigation and commerce uses such as habitat mitigation after navigation and commerce needs are met, if adequate justification is provided for why the project should be located in a specific location to the detriment of possible future navigation and commerce needs. Project proponents typically provide no analysis of why locating habitat on public land is environmentally beneficial or why a particular location has been selected. To make a decision whether mitigation is a good use of state land, DNR wants project proponents to evaluate why mitigation is needed, where the project would best be located, and what type of mitigation project would be most effective and long-lasting. DNR holds that in the face of uncertainty, it is not appropriate to dedicate public lands to mitigation projects, thereby possibly losing revenue and future land management flexibility. This issue would be further complicated if the habitat mitigation is associated with non-water-dependent development of the shoreline. The availability of public land for mitigation purposes could potentially encourage unfavorable non-water-dependent uses of the shoreline. Finally, DNR is very concerned that cumulative impacts not be addressed on a case-by-case basis. If cumulative impacts were addressed in a long-term plan, DNR would be much more comfortable deviating from hard and fast rules.

As required by statute, DNR favors water-dependent uses over other uses in aquatic planning and in resolving conflicts between competing lease applications (RCW 79.90.460(1)). Water-dependent uses are uses that ". . . cannot logically exist in any location but on the water" (RCW 79.90.465(1)). Examples include water-borne commerce, terminal and transfer facilities, moorage and launch facilities, aquaculture, and public fishing piers and parks (RCW 79.90.465(1)). Non-water-dependent uses include

activities that can operate in locations other than on the waterfront (RCW 79.90.465(3)). Examples include hotels, apartments, restaurants, and warehouses that are not part of a marine terminal or transfer facility (RCW 79.90.465(3)).

DNR is required to give reduced lease rates to water-dependent uses. These reduced lease rates are intended to foster these types of uses. Because of these preferential lease rates, public land may bear a disproportionate burden relative to private land in that this may encourage not only more development but more mitigation on public land.

Finally, DNR also reviews and approves or denies aquatic landfill proposals. Such projects may include filling with clean material to create intertidal or subtidal habitat, filling with clean material to create dry land, in-water capping of contaminated sediments with clean material, capping contaminated sediments with clean material and in the process creating dry land, and capping contaminated sediment with contaminated material and in the process creating (contaminated) dry land.

When reviewing these proposals, DNR considers whether the project is compatible with other uses and with the state's public trust responsibilities. This consideration is a particular concern when the fill activities are proposed on state-owned land either for development or contaminated sediment cleanup purposes. If done for development purposes, filling that creates dry land from aquatic land may decrease DNR's management flexibility. If done for the purpose of capping contaminated sediments, as a landowner the state may share financial liability for the project. Another concern with in-place capping of contaminated sediments rather than removing and treating them is that this remedy leaves the contaminants onsite and on public land, thereby creating the potential for ongoing liability if the cap does not hold. Multiuser confined disposal sites may also be problematic for DNR because contamination from a variety of sources may be put on public land, thereby increasing the state's liability.

For landfill or other project proposals on privately owned submerged land, it is DNR's position that the party mitigate for any habitat impacts caused by the activity on the party's own land, not on state-owned land. DNR may consider allowing mitigation on state-owned land only with adequate justification as to why the project should be located there.

MUCKLESHOOT INDIAN TRIBE

The Muckleshoot Indian Tribe is both a resource manager and user. In these contexts, the tribe's four primary interests include fishing, fisheries enhancement, fisheries habitat, and environmental cleanup. The tribe is concerned about having enough fish available to maintain (and enlarge) the fishery and having the physical access necessary to actually conduct the fishery. The Muckleshoot Indian Tribe also has natural resource trustee rights under CERCLA.

The Muckleshoot fishermen use both drift and set nets. In the Duwamish River, there is an issue of compatibility between shoreline uses (i.e., structures along the shoreline) and the ability to use the nets (e.g., where set nets can be placed, the effects of the tides on drift nets). This issue is currently addressed on a case-by-case basis. The tribe would like to act proactively in planning how to accommodate both shoreline projects and the net fisheries.

The Treaty of Point Elliott, case law (e.g., *United States v. Washington, Muckleshoot v. Hall*), and federal and state laws (e.g., CERCLA and SEPA) are the primary authorities that the tribe relies on when addressing environmental concerns. The Treaty of Point Elliott is the highest authority, but in many cases its provisions do not coincide with state and local laws or policies. For example, local shoreline plans do not address fishing, and treaty rights are not recognized in shoreline substantial development permits.

Federal treaties such as the Treaty of Point Elliott derive authority through interpretation in case law. Thus, the tribe relies heavily on case law decisions. For example, *United States v. Washington*, No. 9213, USDC W.D. Washington, addressed the definition of terms in the phrase "access to usual and accustomed fishing grounds and stations," which is a right guaranteed in Article 5 of the Treaty of Point Elliott. Article 5 of the treaty states that "the right of taking fish at usual and accustomed grounds and stations is further secured to said Indians in common with all citizens of the territory . . . ." The court in *United States v. Washington* decided the following:

> The tribes reserved the right to fish at "all usual and accustomed grounds and stations." The word "grounds" and "stations" have substantially different meanings by dictionary definition and as deliberately intended by the authors of the treaties. "Stations" indicates fixed locations such as the site of a fishing weir or a fishing platform or some other narrowly limited area; "grounds" indicates a larger area which may contain numerous stations and other unspecified locations which in the urgency of treaty negotiations could not then have been determined with specific precision and cannot now be so determined. "Usual and accustomed," being closely synonymous words, indicate the exclusion of unfamiliar locations and those used infrequently or at long intervals and extraordinary occasions. Therefore, the court finds and holds that every fishing location where members of a tribe customarily fished from time to time at and before treaty times, however distant from the then usual habitat of the tribe, and whether or not other tribes then also fished distant from the then usual habitat of the tribe, and whether or not other tribes then also fished in the same waters, is a usual and accustomed ground or station at which the treaty tribe reserved, and its members presently have, the right to take fish. (384 F. Supp. 332).

Access to usual and accustomed fishing grounds and stations was adjudicated in *Muckleshoot v. Hall* (698 F. Supp. 1504). In this case, the Muckleshoot Indian Tribe and Suquamish Tribe sought to prohibit issuance of a permit for construction of a marina on one of their accustomed and usual fishing places in Elliott Bay. The marina was constructed in 1990, after the marine developers agreed to incorporate mitigation measures into their development plans to compensate the tribes for impairment to fishing access.

The fishing access issue is also considered in the context of permits issued by the Corps under Section 10 of the Rivers and Harbors Appropriation Act of 1899 and Clean Water Act (CWA) Section 404. In general, the Corps cannot issue a permit under these authorities that impacts access to usual and accustomed fishing grounds and stations without the consent or agreement of the tribes or an act of Congress. Because local shoreline substantial development permits do not recognize treaty rights, the tribe has to work through the Corps permit process to have any involvement in these permit activities.

The Muckleshoot Indian Tribe is becoming more involved in the review of permit applications under SEPA. Also, because land use planning affects tribal resources, the tribe is working with other government entities in the implementation of the Growth Management Act. There is some recognition that tribal resource concerns should be recognized in this process.

THE SUQUAMISH TRIBE OF THE PORT MADISON INDIAN RESERVATION

The term "Suquamish" is from "d'sug'wub," meaning "Place of Clear Waters." The 8,000-acre Port Madison Indian Reservation of the Suwamish Tribe was established in 1855 by the Treaty of Point Elliott. Like the Muckleshoot Indian Tribe, the Treaty of Point Elliott is the highest authority of the Suquamish Tribe. The Suquamish Tribe also has natural resource trustee rights and obligations under CERCLA, and the tribe enters into government-to-government agreements, protocols, and other arrangements denoting coordination and cooperation with other regulatory authorities.

The three primary tribal activities most relevant to the Co-op include timber harvesting, fishing, and shellfish harvesting. Issues that are or could be considered by the Co-op that are of most concern to the tribe include source control, cumulative impacts, the need for fisheries enhancement, and the need for habitat enhancement and restoration.

Timber on the tribe's land is managed in conjunction with the Bureau of Indian Affairs and allotment owners in accordance with the tribe's Forest Operating Plan. Where timber is harvested, a sustainable management approach is used.

The streams and other areas that serve as migration paths and habitat for fish have been significantly altered, thereby affecting the tribe's sustainable fishery. The Suquamish

Tribe is cooperating with the Muckleshoot Indian Tribe regarding a delayed-release net-pen placement near the Cargill grain facility in Elliott Bay. The Suquamish Tribe also has a hatchery program. Together with eggboxes, rearing ponds, and other efforts, the tribe is able to make a significant contribution to the total number and variety of fish available to all fisheries. The tribe is also working to educate the public about the importance of wetlands and water quality and the effects of farm discharges on the aquatic environment and is engaged in habitat restoration and enhancement projects with schools and with sports, civic, and volunteer groups. The Suquamish Tribe currently harvests shellfish on several beaches and co-manages federal- and state-owned tidelands with WDF.

The Suquamish Tribe reserved its right to aquatic resources at "all usual and accustomed grounds and stations" through Article 5 of the Treaty of Point Elliott (January 22, 1855, 12 Stat. 927). The usual and accustomed fishing places of the Suquamish Tribe include the marine waters of Puget Sound from the northern tip of Vashon Island to the Fraser River, including Haro and Rosario straits; the streams draining into the western side of this portion of Puget Sound; and Hood Canal (Order of April 18, 1975, *United States v. Washington*). Incorporated in the Suquamish Tribe's reservation of the right to aquatic resources is the tribe's right to have the fishery resources protected. Hence, the destruction or injury of resources, either directly or indirectly, or through other man-made limitations of productive ability, jeopardize the rights secured to the tribe by treaty.

The Suquamish Tribe both monitors and cooperates with federal, state, and local agencies with respect to the review of proposed projects that affect aquatic resources within its usual and accustomed area. Through coordinating with the Corps; WDF; and other federal, state, and local agencies involved in the permitting process, the tribe protects and promotes cultural awareness, including, but not limited to, fisheries access and opportunity; protection of gear; cultural understanding, particularly relating to archaeological investigations; and the public trust of fish and wildlife habitat.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION/ NATIONAL MARINE FISHERIES SERVICE

National Oceanic and Atmospheric Administration (NOAA) activities that are of particular relevance to the Co-op include those activities carried out under federal natural resource trustee authority.

Federal Natural Resource Trustee Activities

Under the authorities of CERCLA; CWA; the Marine Protection, Research and Sanctuaries Act; and the Oil Pollution Act of 1990, NOAA acts as a federal trustee for natural resources.

As a federal trustee, NOAA acts on behalf of the public to assess and claim damages (compensation) for injuries to natural resources resulting from discharges of oil or releases of hazardous substances. Recovered damages are to be used to restore, replace, or acquire the equivalent of the injured resources (42 USC 9607(f)). Natural resources for which NOAA serves as trustee include all life stages of fishery resources of the exclusive economic zone and continental shelf, anadromous and catadromous species throughout their ranges, certain endangered and threatened species and marine mammals, tidal wetlands and other habitats providing support to these resources, and resources of national sanctuaries and reserves. In some cases, NOAA may share trusteeship with the U.S. Department of the Interior, other federal land-managing agencies, states, and Native American tribes.

To enhance NOAA's effectiveness as a federal trustee for natural resources, the Damage Assessment and Restoration Program (DARP) within NOAA with its two components—the Damage Assessment Center and the Restoration Center—was established in 1991. The objective of DARP is to assess damages and restore coastal and marine habitats and resources under NOAA's trusteeship that have been adversely affected by releases of oil or hazardous substances. DARP determines and quantifies injuries, identifies feasible restoration alternatives and their costs, calculates the compensation to be claimed from potentially responsible parties, refers damage claims to the U.S. Department of Justice for litigation or settlement, uses recovered damages to restore injured resources, monitors the restoration to assess its effectiveness, conducts basic and applied research on restoration methods, applies these techniques to restoration of resource habitats, and provides guidance to habitat managers for selecting among restoration approaches and their shortcomings. The DARP Damage Assessment Center works with the Office of General Counsel to conduct damage assessments and bring claims against potentially responsible parties. The Restoration Center develops and directs national expertise and provides the institutional focus required to identify and evaluate restoration methods for specific cases in the damage assessment process, to use recovered funds to restore the injured resources, and to address research and development priorities necessary for successful resource habitat restoration.

Comprehensive Restoration Planning

Under the authorities of the Magnuson Fisheries Conservation and Management Act, the Marine Mammal Protection Act, the Endangered Species Act, and other legislation, NOAA is required to protect and restore living marine resources and their habitats. In addition, in response to a policy statement issued in 1992 by the DARP Board of Directors, the Seattle DARP office is interested in developing comprehensive restoration plans. The national office is providing recommendations to the Seattle DARP office for what should be included in a plan for Elliott Bay. Key components identified to date include the following:

- The plan should address the alleged injuries that led to the filing of the Elliott Bay NRDA lawsuit

- Endangered species should be given priority in habitat creation activities
- The plan should include long-term (e.g., 20 years) monitoring of restoration projects
- The plan should take a comprehensive, rather than site-specific, approach; Elliott Bay should be looked at as a whole
- There should be both peer and public review of the plan.

In developing comprehensive restoration plans for Elliott Bay, the Seattle DARP office is taking into consideration other issues such as land use and contaminated sediment cleanup because these activities affect restoration planning.

Finally, NOAA is also responsible for reviewing and providing comments on CWA Section 404 permit applications and EISs to determine whether trustee resources might be adversely affected by proposed projects.

U.S. FISH AND WILDLIFE SERVICE

The U.S. Fish and Wildlife Service (FWS) Washington State Ecological Services Office believes that, despite its highly urbanized and degraded character, the Duwamish Estuary continues to support fish and wildlife resources with significant value. Habitat value in the system has been subjected to severe adverse impacts. This leads FWS to conclude that a "net gain" of habitat value is an appropriate goal for the Duwamish. FWS will use all available authorities to protect existing habitat value, while seeking to facilitate resource recovery through support of habitat restoration and enhancement projects. FWS's strong preference will be for projects that restore natural habitat attributes once prevalent in the Duwamish Estuary, and which are now severely diminished.

The primary issues of concern to FWS for the purposes of the Co-op include reviewing dredge and fill or other project permit applications, enforcement of the Endangered Species Act, habitat protection and restoration planning and implementation, and federal natural resource trustee responsibilities.

Federal Projects

Under provisions of the Fish and Wildlife Coordination Act (16 USC §§ 661-667e), consultation with FWS is required where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted . . . or otherwise controlled or modified" by any agency under a federal permit or license. Projects involving federal funding also require consultation with FWS. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources." Staff in the federal projects program are, therefore, involved in commenting on impacts of projects such as dams, reservoirs, and other diversions; navigational

improvements; and flood control projects. In 1982, a widening and deepening project for the Duwamish Estuary proposed by the Corps led to the development of the *Final Fish and Wildlife Coordination Act Report on the East, West and Duwamish Waterways Navigation Improvement Study*. It is the maintenance and improvement of the Duwamish Estuary by the Corps that is most likely to bring about the involvement of federal projects staff in this area. The above-mentioned report is indicative of the issues with which program staff are concerned, and the report provides a useful synopsis of resource conditions in the Duwamish. While all of the wildlife resources which utilize this area, including a variety of shorebirds and mammals are significant to FWS, it is the importance of the estuary to juvenile salmonids that is of particular concern. Salmonids have especially high commercial, cultural, and social value, and juvenile survival for several species is closely linked to estuarine habitat quality and quantity. Protection, restoration, and enhancement of intertidal habitats that support these organisms remain a priority and are strongly preferred to artificial propagation.

Permits

The Fish and Wildlife Coordination Act also gives FWS the authority to comment on federal permits. The permits staff regularly receives and comments on permit applications under Section 10 of the River and Harbors Act (33 USC § 403) and on CWA Section 404 (33 USC §§ 1251-1376). Staff review impacts to fish and wildlife resources and the sufficiency of mitigation proposals in eliminating these impacts. FWS has had a specific habitat mitigation policy that includes habitat values, associated designation criteria, and mitigation goals in place since 1981. These criteria and goals are based on value of habitat to "evaluation species," defined as "fish and wildlife resources in the planning area that are selected for impact analysis." These species are selected to represent social, economic, and broad ecological views to incorporate these various aspects into goal establishment. The following table illustrates how this approach is applied.

Resource Category	Designation Criteria	Mitigation Planning Goal
Category 1 (none in Elliott Bay)	High value for evaluation species; unique and irreplaceable	No loss of existing habitat value
Category 2 (most of Elliott Bay "natural" shoreline)	High value for evaluation species; scarce/becoming scarce	No net loss of in-kind habitat value
Category 3 (much of Elliott Bay developed shoreline)	High-medium value for evaluation species; abundant	No net loss of habitat value; minimize loss of in-kind value
Category 4	Medium-low value for evaluation species	Minimize loss of habitat value

Under guidance from this mitigation policy, FWS strongly believes that:

> The early provision of information to private and public agencies in a form which enables them to *avoid or minimize* fish and wildlife losses as a part of initial project design is the preferred form of fish and wildlife conservation. [emphasis added]

Limited habitat resources in the Duwamish warrant a strong concern for the reduction of adverse project impacts. Habitat value remains important in this system despite its degraded nature, and degraded wetlands often present important opportunities for enhancement and restoration. In assessing the impacts to habitat value from development projects and the benefits to habitat value from mitigation projects, both area and function will be considered, and net gains in both respects will be sought.

Where unavoidable impacts do occur, mitigation planning goals are developed based on resource categories. Remnant native habitat, fringing marsh or riparian areas, and unvegetated fine-grained shallows (mud and sandflat) would likely be designated Resource Category 2. These areas are characterized as "of high value for evaluation species and relatively scarce or becoming scarce on a national basis or in the ecoregion section." The mitigation goal for Resource Category 2 areas is "No net loss of in-kind habitat value." Habitat losses remaining after impact reduction should be compensated by "replacement of the same kind of habitat value so that the total loss of such in-kind habitat will be eliminated."

Other, more highly modified intertidal areas (e.g., rip rap slopes, sites under pier aprons) in the Duwamish River and Elliott Bay are likely to be considered Resource Category 3 or 4. While a reduction of project impacts will also be sought for such sites and FWS will require mitigation to completely offset loss of habitat value, in-kind replacement may not be required. Replacement of lost habitat value by more natural habitat types may be preferred.

To verify that lost habitat value has been replaced by a mitigation project, FWS will require monitoring of these sites. Depending on project size and complexity, 5–10 years is likely the minimum monitoring period for most intertidal habitat mitigation projects. In addition to monitoring, FWS would seek assurances of long-term protection, maintenance, and contingency measures for habitat mitigation sites.

Endangered Species

The Endangered Species Act of 1973 provided for the conservation of ecosystems upon which threatened and endangered species of fish, wildlife and plants depend. FWS and the National Marine Fisheries Service (NMFS) share responsibility for enforcing the Endangered Species Act, including listing species as threatened or endangered, developing recovery plans for listed species, taking pre-listing actions to preclude a species from being listed, consulting on federal actions that may affect listed species (including permit

actions), and making permit decisions where a non-federal action might "take" a listed species. It is important to note that NMFS has responsibility for listed anadromous fish species.

Bald eagles (*Haliaeetus leucocephalus*), federally listed as threatened in Washington state, are known to use portions of Elliott Bay. Projects with potential adverse impacts to bald eagle areas would be regulated by FWS. Of equal importance to FWS is the prevention of declines in populations that ultimately necessitate listing under the Endangered Species Act. Salmonid stocks are on the decline in many portions of Puget Sound and may warrant consideration of protection under this act. In the Duwamish, it is the FWS objective to prevent further habitat deterioration that threatens ecosystem health. Chum salmon (*Oncorhynchus keta*) represent an example of animals dependent on estuarine habitat for survival that are declining in this watershed.

Contaminants

The FWS Environmental Contaminants Program addresses impacts to fish and wildlife due to pollution, and includes oil spill response and fish and wildlife contaminants investigations. As a natural resource trustee, FWS conducts damage assessments to identify injuries to fish and wildlife trust resources resulting from oil and hazardous substance discharges and recovers damages from polluters to use for restoring the injured natural resources.

Private Lands

The FWS Partners for Wildlife Program and Washington State Ecosystems Conservation Program both make funds available for habitat conservation and restoration on private lands on a cost-share basis, targeting wetland and riparian habitat. Though traditionally this program has worked primarily with farmers and other private landowners, there are opportunities to work with public and private landowners in the Green/Duwamish River watershed, which would help downstream resources in the Duwamish Estuary.

Puget Sound Program

Another program involved in habitat restoration is the Puget Sound Program. Staff pursue a system-wide approach to restoration from both a planning and project implementation standpoint. In doing so, FWS is attempting to respond to the Puget Sound Water Quality Management Plan. This document directs FWS, along with EPA, the Corps, and Ecology to develop a program of wetland restoration. FWS is working closely with these agencies in pursuing several pilot restoration projects in the Puget Sound region, including three projects in the Duwamish. This program addresses habitat restoration planning and project implementation, with a goal of addressing such actions from an ecosystem perspective. The Puget Sound Program is also developing a long-term

monitoring program to evaluate contaminants in Puget Sound water birds, with plans to include work in Elliott Bay.

U.S. ARMY CORPS OF ENGINEERS

For the purposes of the Co-op, the primary issues of concern to the Corps include dredge and fill activities that result in relatively permanent alterations of aquatic or dry land (e.g., in-water filling to restore habitat, in-water dredging to remediate contaminated sediments, filling of wetlands to create dry land), and maintenance (i.e., periodic) dredging for navigation. The Corps has primary responsibility for managing these activities, as discussed below.

Dredge and Fill Permitting

The Corps manages dredged material under Section 10 of the Rivers and Harbors Appropriation Act of 1899 and CWA Section 404. Section 10 of the Rivers and Harbors Appropriation Act of 1899 addresses work in navigable waters (including dredge and fill activities). This section specifically states that any construction in or over navigable waters; excavation from or deposition of material in such waters; or the accomplishment of any other work affecting the course, location, condition, or capacity of such waters is unlawful without a permit from the Corps (33 CFR § 320.2(b)).

CWA Section 404 addresses the discharge of dredged material into all waters of the state (including wetlands). This section authorizes the Corp to issue permits, after notice and opportunity for public hearing, for the discharge of dredge or fill material into the waters of the United States at specified disposal sites (33 CFR § 320.2(f)).

In the past, the Corps regulatory program was primarily focused on protection of navigation. This program has now evolved into one that includes consideration of the full public interest by balancing the favorable impacts against detrimental impacts (33 CFR § 320.1(a)(1)). The decision whether to issue a permit for dredge or fill activities is based on an evaluation of the probable impacts, including cumulative impacts, of the proposed activity and its intended use on the public interest. Evaluating whether a proposed activity is in the public interest requires a balancing of the benefits against foreseeable detriments.

When evaluating a permit application, the Corps must consider several factors, including whether state water quality standards would be violated; whether important wetlands or marine sanctuaries would be altered; possible loss or damage to fish and wildlife; the consistency of the proposed activity with the Coastal Zone Management Program; whether the proposed activity would affect areas with recognized historic, cultural, scenic, conservation, recreation, or other values; whether the proposed activity is associated with federal projects; the potential effect of the proposed project on threatened or endangered species (33 CFR § 320.4, 33 CFR § 325.2); and other public interest

factors. The decision on whether to authorize a permit must reflect the national concern for both protection and utilization of important resources (33 CFR § 320.4(a)(1)). Possible mitigative measures are to be considered throughout the permit application review process, including avoiding, minimizing, rectifying, reducing, or compensating for resource losses. Losses are to be avoided to the extent practicable; mitigation may occur onsite or at an offsite location (33 CFR § 320.4(r)).

Several other agencies have authority to review and comment on permit applications to ensure that issues of particular concern to each agency are adequately addressed (e.g., to assure adequate mitigation for habitat loss). This review authority is discussed in the other sections of this appendix, as appropriate. In addition, at Superfund sites where a remedial action plan is in place, this permitting authority is effectively transferred to EPA.

The Corps can issue three different types of permits under the authority of CWA Section 404; Section 10 of the Rivers and Harbors Appropriation Act of 1899; and Section 103 of the Marine Protection, Research, and Sanctuaries Act (for ocean disposal of dredged material) that address dredge and fill activities: nationwide permits, regional permits, and individual permits. The level of documentation and required activities prior to permit issuance vary from one type of permit to the next. The individual permit authorizes a specific activity and requires the most effort prior to a permit decision; for example, an evaluation of whether an EIS will be required and, if so, completion of the EIS.

The other two types of permits are referred to jointly as general permits and authorize a category or categories of activities nationwide or in specific geographical regions. A general permit is defined as:

> . . . a Department of Army [Corps] authorization that is issued on a nationwide or regional basis for a category or categories of activities when: 1) Those activities are substantially similar in nature and cause only minimal individual and cumulative environmental impacts; or 2) The general permit would result in avoiding unnecessary duplication of the regulatory control exercised by another Federal, state, or local agency provided it has been determined that the environmental consequences of the action are individually and cumulatively minimal. (33 CFR § 322.2(f))

These general permits (particularly the nationwide permit) are designed to regulate with little, if any, delay or paperwork certain activities that have minimal impacts (33 CFR § 330.1(b)). If an activity is covered by one of the general permits, a Corps permit application does not have to be completed (though notification of the district engineer may be required). In this case, the person must only comply with the conditions contained in the general permit (33 CFR § 320.1(c)).

Issuance of a nationwide permit does not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations as required by law (33 CFR § 330.4(b)(2)). For example, a CWA Section 401 water quality certification, or a waiver thereof, from the state is required prior to issuance of a nationwide permit authorizing activities that may result in a discharge to into United States waters (33 CFR § 330.4(c)). In addition, pursuant to CZMA Section 307(c)(1), the Corps is required to provide a consistency determination and receive state agreement prior to issuance of a nationwide permit that authorizes activities in a state with a federally approved Coastal Zone Management Program when the activities will affect land or water uses or natural resources of the state's coastal zone (33 CFR § 330.4(d)).

No activity is authorized by a nationwide permit if the activity is likely to jeopardize the continued existence of a threatened or endangered species, destroy or adversely modify the critical habitat of such a species, or may affect properties listed or eligible for listing in the National Register of Historic Places (33 CFR § 330.4(f) and (g)). Specific nationwide permits and conditions are listed in Appendix A to 33 CFR Part 330. Nationwide permit examples include scientific measurement devices, temporary recreational structures, and minor discharges of dredged or fill material. Regional conditions for the State of Washington that will be applied to several of the nationwide permitted activities are set forth in a Corps Special Public Notice dated February 11, 1992 (U.S. COE 1992).

According to Corps representatives, it may be appropriate to seek a regional permit (rather than a nationwide permit) to cover activities under the Co-op effort; this permit could be fashioned to meet requirements and concerns that are specific to this area. In practice, the Corps will deny a permit under the following conditions:

- Ecology determines that the proposed project would violate water quality standards or would be inconsistent with CZMA, including the Shoreline Management Act
- The FWS or NMFS determines that the proposed project would adversely affect endangered species or critical habitat.

Guidance on locating dredge and fill material disposal sites is provided in 40 CFR Part 230. Section 230.10(b) states that no discharge of dredge or fill material will be permitted if it 1) causes or contributes to (after consideration of dilution and dispersion) violations of applicable state water quality standards; 2) violates applicable toxic effluent standards or prohibitions under CWA Section 307; 3) jeopardizes the continued existence of endangered or threatened species, or results in likelihood of the destruction or adverse modification of a habitat, which is determined to be critical habitat under the Endangered Species Act; or 4) violates any requirement imposed by the Secretary of Commerce to protect marine sanctuaries.

Maintenance Dredging

In addition to having the responsibility for authorizing dredge and fill activities intended to result in permanent alterations in aquatic or dry land, the Corps also has responsibility for permitting or performing maintenance dredging for navigational purposes. Like dredging conducted for other purposes, a party would be required to apply for a Section 10 permit (for dredging and disposal) and, if appropriate, a Section 404 permit (for the discharge/disposal of dredged material into waters of the state). When necessary, the Corps conducts maintenance dredging in federal navigation channels. The Corps does not issue itself a maintenance dredging permit, but does evaluate impacts that may occur from the activity and provides notice to the public of the planned activity.

The Corps has an ongoing maintenance dredging project in the Duwamish Estuary (30 ft deep for 2.6 miles, 20 ft deep for 0.8 miles, and 15 ft deep for 1.8 miles to the head of navigation) and the East and West waterways (34 ft deep) around Harbor Island. Maintenance dredging (averaging 120,000 yd^3) of the upper waterway was done in 1984, 1986, 1987, 1990, and 1992. Most of this material was deposited at the Four Mile Rock and Elliott Bay open-water disposal sites authorized by the Puget Sound Dredged Disposal Analysis. Only approximately 25,000 yd^3 of this material required confined disposal and was placed into the Port of Seattle short fill at Terminal 91. The remaining material has been used as fill or clean capping material for contaminated sediments in Elliott Bay. Maintenance dredging of the upper waterway is scheduled again for February and March 1994 and planned for every 2 years thereafter.

U.S. ENVIRONMENTAL PROTECTION AGENCY

CWA is the primary authority for activities conducted by EPA. Activities regulated or of concern to EPA are discussed below.

Dredge and Fill Activities

CWA Section 404C gives EPA veto authority over the Corps to deny a dredge or fill permit application if the proposed project would result in the discharge of dredged materials into the aquatic environment at restricted or undefined disposal sites. EPA is authorized to deny specification of an area as a disposal site and to deny or restrict the use of any defined disposal site when it is determined that the discharge of dredge or fill material in such an area ". . . will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas" (33 USC 1344(c)). This authority is EPA's primary tool for managing and preserving wetland areas. In an effort to minimize potential conflicts between Corps and EPA concerns, these two agencies work together closely in the preparation of permits for dredge or fill activities.

Cleanup of Superfund Sites

Permit authority for dredge and fill activities is in essence transferred from the Corps to EPA at Superfund sites, but EPA does not actually have permitting authority under CWA Section 404. Instead, the activities conducted at these sites must meet the substantive requirements of this authority. In addition, although EPA does not prepare an EIS in cases where one would be required if the Corps were to issue a permit, a document functionally equivalent to an EIS is prepared. In Region 10, EPA is coordinating with the Corps to make sure that activities conducted at Superfund sites meet the requirements of permits issued under CWA Section 404.

In general, EPA takes control of cleanup activities at Superfund sites. If EPA pays for the cleanup, restoration is not typically done, but the authority does exist. If potentially responsible parties are paying for the cleanup, EPA can require them to conduct restoration activities, and restoration elements are usually included in the remedial planning process. One issue that needs clarification is whether EPA has authority over all dredge and fill activities conducted within the site boundaries, or whether this authority is defined by the remedial action plan. It is likely that EPA's authority extends only over the activities set forth in the remedial action plan, but EPA and the Corps need to formalize this understanding.

With regard to the cleanup of contaminated sites, EPA is very interested in promoting voluntary actions rather than issuing enforcement orders. Voluntary actions are more efficient, timely, and cost-effective.

Water Quality Management

Under CWA Section 402, EPA has responsibility for managing water quality through the NPDES permitting process. This program limits the concentrations of pollutants allowed to be discharged from point sources into the aquatic environment and imposes monitoring requirements on the discharge to ensure that those limitations are not exceeded. The intent of this program is to limit, to the maximum extent practicable, the quantity of pollutants being discharged into the aquatic environment.

Upon approval of a state permit program, EPA has the authority to delegate the NPDES permitting authority to any state desiring to administer its own permit program for discharges into navigable waters within its jurisdiction (33 USC 1342(b)). In Washington, this responsibility has been delegated to Ecology.

Habitat Mitigation

EPA is concerned with habitat mitigation activities, and EPA's mitigation policy is currently being evaluated and modified. Mitigation guidelines are being developed, but no specific requirements have yet been decided.

U.S. COAST GUARD

It is the duty and responsibility of the U.S. Coast Guard (USCG) (under authorities delegated to the Commandant) to preserve the public right of navigation. Under 14 USC § 2, the USCG is required to ". . . develop, maintain, establish, and operate with due regard to the requirements of national defense, aids to maritime navigation for promotion of safety on and over the high seas and waters subject to jurisdiction of the United States." 14 USC § 81 charges the USCG to administer an aid to the navigation system that serves the needs of the Armed Forces and the commerce of the United States "in order to . . . prevent disasters, collisions and wrecks of vessels and aircraft." Integral to the responsibilities of the USCG is maintaining close liaison with other federal and state agencies and managers of waterborne commerce to ensure coordination of activities affecting the national transportation system, national economy, and national defense. Obstructions to navigation in Elliott Bay and the Duwamish Estuary, be they short-lived or long-term, that are the result of sediment cleanup or habitat restoration projects must be coordinated with the Thirteenth Coast Guard District Office of Aids to Navigation and Waterways Management.

THE BOEING COMPANY

The Boeing Company owns a significant amount of shoreline property along the Duwamish River. Boeing is interested in activities or issues that may affect use of this shoreline area, including habitat placement and regulatory requirements and restrictions. Boeing is a regulated party, not a regulator of environmental concerns. Depending on the activity, Boeing may be subject to any of the regulatory and statutory requirements discussed in this report.

REFERENCES

Port of Seattle. 1985. Comprehensive public access plan for the Duwamish Waterway. Port of Seattle, Seattle, Washington.

Port of Seattle. 1991. Container terminal development plan. Port of Seattle, Seattle, WA.

PSWQA. 1986 (updated 1989, 1991). 1987 Puget Sound water quality management plan. Puget Sound Water Quality Authority, Seattle, WA.

U.S. COE. 1992. Special public notice: nationwide permits—regional conditions for the State of Washington. U.S. Army Corps of Engineers, Seattle District, Regulatory Branch, Seattle, WA.

APPENDIX C

Management Unit Descriptions

ELLIOTT BAY CO-OP—MANAGEMENT UNIT DESCRIPTIONS

UNIT NO. 1—ELLIOTT BAY

Elliott Bay deep water area.

Boundaries: From the seaward edge of all units along the Elliott Bay shoreline (at the outer harbor line or at a depth of 80 ft, whichever is further from shore), north to West Point and south to Alki Point.

Features:

1.	Shoreline Designations:	Conservancy (CN)[1]
2.	Property Ownership:	Submerged lands—DNR
3.	Shoreline Condition:	N/A
4.	Existing Uses:	Outfalls, PSDDA site
5.	Proposed Uses:	
6.	Navigation:	Deep draft
7.	Fishing Activities:	Treaty fishing with drift nets Recreational angling from boats
8.	Habitat Type:	Deep water, muddy/sandy bottom
9.	Habitat Use:	

Function	Evaluation Species
Feeding	— Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)

[1] Description of abbreviations attached; all Elliott Bay is designated CN (conservancy navigation) at some distance from the shore.

	Spawning	— Rockfish, flatfish, smelt
	All activities through life cycle	— Crabs, shrimp, bivalves
10. Physical Dynamics:	Variable top to bottom	
11. Water Characteristics:	Good quality	
12. Sediment Characteristics:	Quality—Good Type—Muddy/sandy	

UNIT NO. 2—WEST POINT TO MAGNOLIA BLUFF

Primarily natural, undeveloped shoreline.

Boundaries: West Point to the west side of the Elliott Bay Marina.

Features:

1. Shoreline Designations:	City of Seattle—Conservancy (CP, CR, CM) and Urban (UR)	
2. Property Ownership:	Submerged lands—DNR, City of Seattle, private Adjacent upland—City of Seattle, Metro (?), private	
3. Shoreline Condition:	Primarily natural shoreline with high bluffs and sandy beaches; some rip-rap stabilization	
4. Shoreline Uses:	Primarily residential, some parks, treatment plant	
5. Proposed Uses:	Houses on stilts have been proposed for privately owned tidelands in 1992	
6. Navigation:	No vessel berthing at shoreline; deeper areas used for anchorage and passage	
7. Fishing Activities:	Treaty fishing with drift nets Recreational angling (salmon and reef fish) and shellfish harvesting	
8. Habitat Type:	Broad to narrow intertidal beaches, sand to cobble, backed by high bluffs in places. Relatively wide subtidal shelf before slope to deep water. Eelgrass and kelp beds present.	

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Spawning	— Rockfish, flatfish, smelt
All activities through life cycle	— Crabs, bivalves

10. Physical Dynamics: Highly exposed to storms and waves; active bluff erosion in places; strong nearshore currents

11. Water Characteristics: Nearshore influenced by thin layer of Duwamish River plume and plumes from various CSOs and storm drains around Elliott Bay. High salinity in deeper layers. History of sewer pipe breaks. Suspected contributions from shoreline residences and local storm drains. Metro outfall in deep water (250 ft) at north boundary. Marina adjacent to south border.

12. Sediment Characteristics: Quality—Believed to be generally good
Type—Coarse- to medium-grained intertidal sandy subtidal

UNIT NO. 3—ELLIOTT BAY MARINA AND TERMINAL 91

Primarily developed shoreline (marina and piers) and shift in use from Unit 2.

Boundaries: From the west side of the Elliott Bay Marina east to the southwest edge of Pier 89 including the marina, Smith Cove Park, and the slips of Terminal 91.

Features:

1. Shoreline Designations: City of Seattle—Conservancy (CM) and Urban (UR, UI)

2. Property Ownership: Submerged lands—DNR, City of Seattle, Port, private
Adjacent upland—City of Seattle, Port, private

3. Shoreline Condition: Mostly altered but some intertidal beach at Smith Cove Park and where the slips don't have aprons; rip-rapped slopes and piling at piers.

4. Shoreline Uses: Recreational boat moorage, deep draft vessel berthing and loading, petroleum handling and holding facility with large-vessel fueling dock, recreation, warehouse and commercial uses.

5. Proposed Uses: No active proposals

6. Navigation: Shallow draft vessels in and out of marina, shallow and deep draft vessels in and out of Terminal 91 slips.

7. Fishing Activities: Treaty fishing with drift nets
Recreational angling (salmon and reef fish) and shellfish harvesting

8. Habitat Type: Ranges from exposed sand/cobble beach at park to sheltered bottom in marina and apron-shaded rip--rapped slopes along Terminal 91 piers. Shallow subtidal and intertidal habitat in pier slips, including mitigation sites along piers 89/90 and 91 west shoreline; kelp in front of park.

9. Habitat Use:

Function		Evaluation Species
Feeding	—	Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Spawning	—	Rockfish, flatfish, smelt
All activities through life cycle	—	Crabs, bivalves

10. Physical Dynamics: High exposure at park, south ends of piers, and marina breakwaters. Sheltered behind breakwaters and, usually, in slips. Moderate currents outside piers.

11. Water Characteristics: Several major storm drains into Terminal 91 slips and Interbay CSO at rear of Terminal 89/90 slip. Surface water influenced by thin layer of Duwamish River plume and plumes from various CSOs and storm drains around Elliott Bay. High salinity in deeper layers. History of oil spills.

12. Sediment Characteristics: Quality—Isolated problem areas (the Port has a major contaminated sediment confined disposal site between Terminals 90 and 91).
Type—Sandy- and coarse-grained intertidal fine-grained subtidal.

UNIT NO. 4—ELLIOTT BAY/MYRTLE EDWARDS PARK

Primarily natural, undeveloped shoreline and shift in use from Unit 3.

Boundaries: From the southwest end of Pier 89 southeast to where the central waterfront seawall begins just north of Pier 71.

Features:

1. Shoreline Designations: City of Seattle—Conservancy (CM) and Urban (US, UG, UI)

2. Property Ownership: Submerged lands—DNR, City of Seattle, Port
Adjacent upland—City of Seattle, Port, private

3. Shoreline Condition: Altered shoreline of rip-rap and large rocks with some patches of intertidal sand beach. Rapid drop-off to deeper water.

4. Shoreline Uses: Bulk cargo transhipment at grain elevator, recreational fishing at public fishing pier, mostly park, major CSO discharges. Isolated from uses further inland by railroad.

5. Proposed Uses: Potential Port light industrial development; tribal proposal for salmon delayed-release net pens; beach enhancement activities proposed for city park.

6. Navigation: Deep draft vessel activity to grain elevator only with anchorage offshore. Some small boats around fish reef. Shallow draft vessels (e.g., tour boats, tugs) along shore.

7. Fishing Activities: Treaty fishing with drift nets
Recreational angling from fishing pier and small boats

8. Habitat Type: Narrow, highly exposed intertidal with rapid slope to deep water. Pockets of sandy beach. Some kelp offshore.

9. Habitat Use:

Function		Evaluation Species
Feeding	—	Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Spawning	—	Rockfish, flatfish, smelt
All activities through life cycle	—	Crabs, bivalves

10. Physical Dynamics: Highly exposed shoreline cut off from natural sources of sediment. Moderate to high currents.

11. Water Characteristics: Surface water influenced by Duwamish River plume and direct effect of a major CSO. Deep water is good quality and high salinity.

12. Sediment Characteristics: Quality—Sediment contamination high near outfalls (experimental capping at Denny CSO) and believed to be moderate to good elsewhere
Type—?

UNIT NO. 5—SEATTLE CENTRAL WATERFRONT

Primarily developed shoreline (piers), shift in use from Unit 4, and shift in city designation (now urban harborfront) from previous units.

Boundaries: From the beginning of the sawmill north of Pier 71 to the south side of Washington Street (south of the ferry terminal).

Features:

1.	Shoreline Designations:	City of Seattle—Urban Harborfront (UH) DNR—Small portion designated a public place
2.	Property Ownership:	Submerged lands—DNR, DOT, City of Seattle (?), Port, private Adjacent upland—City of Seattle, Port, private
3.	Shoreline Condition:	Seawall along street front (vertical bulkhead with rip-rap at base) and piers on timber and concrete piling. Little intertidal area. Deep water at outer ends of piers.
4.	Shoreline Uses:	Piers support vessel berthing and passenger loading/ unloading but virtually no cargo handling. Pier sheds used for commercial, industrial, and tourism, including restaurants and shops. Major state ferry terminal. Aquarium supports education, research, and tourism. Four controlled CSOs and many storm drains in this unit.
5.	Proposed Uses:	Proposed redevelopment in Pier 66 area including "marina" activities. Numerous ideas for central water-front redevelopment.
6.	Navigation:	Pier slips allow shallow draft berthing to shoreline, deep draft at ends of piers. Active ferry and tour boat traffic. Some routine berthing of working vessels. Periodic berthing of visiting vessels, i.e., tall ships and navy vessels.
7.	Fishing Activities:	Treaty fishing with drift nets Recreational angling from piers and seawall
8.	Habitat Type:	Limited intertidal, mostly seawall. Numerous pilings in subtidal zone. Slip bottoms mostly muddy. Some kelp where bottom has rubble.

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	— Salmonids (out-migrants), rock-fish, flatfish, smelt

Holding	—	Salmonids (adult in-migrants)
Spawning	—	Rockfish, flatfish, smelt
All activities through life cycle	—	Crabs

10. Physical Dynamics: Exposed to some storms and frequent vessel wakes. Piers slow currents near seawall.

11. Water Characteristics: Major influence from Duwamish River plume. Periodic CSO and stormwater overflows (the four CSOs are controlled). Deeper layer of high salinity. Major problem with floating trash and debris.

12. Sediment Characteristics: Quality—Sediment contamination generally high all along the waterfront (there is a sediment remediation [capping] project at Pier 53).
Type—Fine-grained

UNIT NO. 6—SOUTHEAST CONTAINER TERMINALS

Shift in use from Unit 5.

Boundaries: From Washington Street south and west to the north side of the Coast Guard facility at Pier 36.

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI) and Urban Harborfront (UH) Washington Street to Jackson Street

2. Property Ownership: Submerged lands—DNR, Port
Adjacent upland—City of Seattle, Port

3. Shoreline Condition: Shoreline is piling and pier apron covering rip-rap slope

4. Shoreline Uses: Intensive cargo and passenger vessel berthing. Limited public access.

5. Proposed Uses: Proposed minor reconfiguration of Pier 48 for passenger vessels

6. Navigation: Large container vessel movement and berthing, miscellaneous vessels berthing and unloading at Pier 48.

7. Fishing Activities: Treaty fishing with drift nets (salmon)
Limited recreational angling activity from pier

8. Habitat Type: Limited natural nearshore habitat

9. Habitat Use (Outer Bay):

Function		Evaluation Species
Feeding	—	Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Spawning	—	Rockfish, flatfish, smelt
All activities through life cycle	—	Crabs

(Inner Bay):

Function		Evaluation Species
Feeding	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Transition	—	Salmonids (smolt out-migrants)
Migration	—	Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Moderate exposure to northerly storms. Low currents.

11. Water Characteristics: Strong influence of Duwamish River plume; periodic CSO and storm drain influence (two resident CSOs and Duwamish CSOs—not controlled).

12. Sediment Characteristics: Quality—Moderate to high contamination at Pier 48
Type—Fine-grained

UNIT NO. 7—SOUTH ELLIOTT BAY

Directly exposed to open bay; part of Superfund site.

Boundaries: Northeast corner of Terminal 18 to northwest industrial boundary southeast of Bronson Way at the location of DNR's lease number 2735 (close to Salty's).

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI)

2. Property Ownership: Submerged lands—DNR, City of Seattle (?), Port, private
   Adjacent upland—DNR, City of Seattle, Port, private

3. Shoreline Condition: Rip-rap, pier apron, dry docks, marine way, no natural undeveloped shoreline

4. Shoreline Uses: Container yard, ship repair, cargo transfer, industrial (Wyckoff), vacant (former shipyard)

5. Proposed Uses: Confined contaminated sediment disposal site and container terminal expansion at Terminal 3 (Port). Superfund cleanup. Potential habitat concern; potential daylighting of Longfellow Creek; potential public access

6. Navigation: Deep draft

7. Fishing Activities: Treaty fishing, primarily set net
   Recreational angling from boats

8. Habitat Type: Some subtidal areas contain kelp beds, especially the north shore of Terminal 18. Little, if any, natural intertidal habitat.

9. Habitat Use (Outer Bay):

Function	Evaluation Species
Feeding	— Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	— Salmonids (out-migrants), rockfish, flatfish, smelt

	Holding	—	Salmonids (adult in-migrants)
	Spawning	—	Rockfish, flatfish, smelt
	All activities through life cycle	—	Crabs
(Inner Bay):	Feeding	—	Salmonids (out-migrants), rockfish, flatfish, smelt
	Holding	—	Salmonids (adult in-migrants)
	Transition	—	Salmonids (smolt out-migrants)
	Migration	—	Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Exposed to northerly storms. Generally low currents.

11. Water Characteristics: Influenced by Duwamish River and CSO plumes. Longfellow Slough inflow (groundwater and storm drains). Surface water has low salinity.

12. Sediment Characteristics: Quality—Highly contaminated in some areas (Superfund site)
Type—Fine-grained, except for sandblast grit

UNIT NO. 8—SEACREST

Decreased industrial activity from Unit 7.

Boundaries: Northwest industrial boundary south of Bronson Way at the location of DNR's lease number 2735 west to the Duwamish Head.

Features:

1. Shoreline Designations: City of Seattle—Conservancy (CP, CR, CM) and Urban (UR, US)

2. Property Ownership: Submerged lands—DNR
Adjacent upland—City of Seattle (parks), private

3. Shoreline Condition: Rip-rap dominated with a few piers and some areas of gravel/cobble beach

4. Shoreline Uses: Primarily parks, some commercial (restaurant), boat launching, boat docks, shoreline path, beach use

5. Proposed Uses: Several ideas for private lands (marina, condos) but no active permits and stalled because of need for cleanup

6. Navigation: Some offshore barge moorage, active recreational craft boat launch

7. Fishing Activities: Treaty fishing with drift nets
Popular recreational fishing access point, angling from boats, possible shellfish gathering

8. Habitat Type: Rip-rap, unconsolidated beaches with little, if any, organic accumulation

9. Habitat Use (Outer Bay):

Function		Evaluation Species
Feeding	—	Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Spawning	—	Rockfish, flatfish, smelt
All activities through life cycle	—	Crabs

(Inner Bay):

Function		Evaluation Species
Feeding	—	Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	—	Salmonids (adult in-migrants)
Transition	—	Salmonids (smolt out-migrants)
Migration	—	Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Highly exposed to northerly winds

11. Water Characteristics: High salinity, few known or suspected sources, not influenced by main Duwamish River plume

12. Sediment Characteristics: Quality—Low quality south end, generally high (?) toward north end, few sources
Type—Gravel, sand

UNIT NO. 9—ALKI BEACH

Shift in use from Unit 8 (primarily residential and retail).

Boundaries: Duwamish Head to Alki Point.

Features:

1. Shoreline Designations: City of Seattle—Conservancy (CP, CR, CM) and Urban (UR, US)

2. Property Ownership: Submerged lands—DNR
Adjacent lands—City of Seattle, private

3. Shoreline Condition: Primarily sand and gravel beach

4. Shoreline Uses: Recreation (park) and residential

5. Proposed Uses: None known

6. Navigation: Recreational

7. Fishing Activities: Treaty fishing with drift nets
Recreational angling from boats (mostly at northern end) and shellfish gathering

8. Habitat Type: Sand and gravel beach

9. Habitat Use (Outer Bay):

Function	Evaluation Species
Feeding	— Salmonids (in- and out-migrants), rockfish, flatfish, smelt
Rearing	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)

	Spawning	—	Rockfish, flatfish, smelt
	All activities through life cycle	—	Crabs, bivalves
(Inner Bay):	Feeding	—	Salmonids (out-migrants), rockfish, flatfish, smelt
	Holding	—	Salmonids (adult in-migrants)
	Transition	—	Salmonids (smolt out-migrants)
	Migration	—	Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Exposed to northerly and westerly winds

11. Water Characteristics: Generally good quality, Metro CSO in deep water at Duwamish Head

12. Sediment Characteristics: Quality—Generally good (?)
Type—Sandy

UNIT NO. 10—WEST WATERWAY

Shift from open bay to interior waterway.

Boundaries: Southeast corner of the harbor line across to the northeast corner of the Lockheed shoreline and south down the West Waterway to the north end of Pigeon Point Reach.

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI)

2. Property Ownership: Submerged lands—DNR, Port, private
Adjacent upland—Port, private

3. Shoreline Condition: Pier apron, shipways, rip-rap, one small pocket of relatively natural shoreline

4. Shoreline Uses: Port berthing, abandoned and active shipyards, industrial, tank farm

5. Proposed Uses: Port container terminal expansion, Superfund cleanup

6. Navigation: Deep draft, commercial, recreational

7. Fishing Activities: Treaty fishing with river skiff gill nets
Recreational angling from boats and limited angling from the shore

8. Habitat Type: Highly modified with one small pocket of natural shoreline, "mouth" of Longfellow Creek in southwest corner

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)
Migration	— Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Some exposure to northerly winds, high boat wake energy, variable currents

11. Water Characteristics: Moderate quality, sediment-laden

12. Sediment Characteristics: Quality—Poor with many documented areas of contamination
Type—Sandy mud

UNIT NO. 11—PIGEON POINT REACH

Shift in physical conditions (waterway narrows, water velocity increases, and sediment type differs).

Boundaries: North end of Pigeon Point Reach south to the north boundary of Terminal 105 and across to the southwest corner of Harbor Island.

Features:

1. Shoreline designation: City of Seattle—Urban Industrial (UI)

2. Property ownership: Submerged lands—DNR, Port, private
   Adjacent upland—City of Seattle, Port, private

3. Shoreline Condition: Predominantly rip-rap, some pier apron, no unstabilized shoreline

4. Shoreline Uses: Barge loading and unloading, marina, street and rail crossings, parking, storage

5. Proposed Uses: Widening and deepening of waterway, installation of force main crossing

6. Navigation: Deep draft and recreational

7. Fishing Activities: Treaty fishing with river skiff gill nets
   Recreational angling from the shore

8. Habitat Type: Rip-rap, sheet piling, vertical bulkhead (highly modified, structurally stabilized shoreline)

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)
Migration	— Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: High boat wake energy, river currents

11. Water Characteristics: Moderate quality with City of Seattle CSO (?)

12. Sediment Characteristics: Quality—Poor
    Type—Sandy

UNIT NO. 12—EAST WATERWAY

Shift from open bay to interior waterway.

Boundaries: From the north end of the East Waterway, beginning at the north side of the Coast Guard property on the east bank and the north tip of the Terminal 18 apron on the west bank, south including both sides of the East Waterway to the point where the waterway narrows north of Spokane Street.

Features:

1.	Shoreline Designations:	City of Seattle—Urban Industrial (UI) DNR—Waterway
2.	Property Ownership:	Submerged lands—DNR, Coast Guard, City of Seattle, Port, private Adjacent upland—Coast Guard, Port, private
3.	Shoreline Condition:	Primary rip-rap and pier apron; dredged; developed; deep water (35–50 ft) at apron face; some sheet piling.
4.	Shoreline Uses:	Industry and commerce; two large CSOs (one controlled); berthing
5.	Proposed Uses:	Expansion of Port uses; potential habitat restoration; proposed Superfund cleanup
6.	Navigation:	Moderate to deep draft vessels
7.	Fishing Activities:	Treaty fishing with river skiff gill nets Limited recreational angling from the shore
8.	Habitat Type:	Small intertidal mud area at Pier 27

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)

	Migration	— Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)
10. Physical Dynamics:		Sheltered from wave action; lower flow/turbidity than West Waterway; low currents
11. Water Characteristics:		High salinity with thin freshwater lens; two major CSOs (one controlled), numerous storm drains; limited flushing
12. Sediment Characteristics:		Quality—poor except where dredged; partially a Superfund site Type—mud bottom

UNIT NO. 13—SPOKANE STREET

Shift in use from Unit 12 (shallow and unusable by deep draft vessels).

Boundaries: Portions of the East Waterway from the south end of Terminal 20 to the northwest corner of Ashgrove Cement, westerly to the northeast corner of Terminal 105 (inclusive of the Harbor Island Marina), around the south end of Harbor Island to the southwest corner of Harbor Island at the south end of Pigeon Point Reach (projection west to Bradford Avenue).

Features:

1. Shoreline Designations:	City of Seattle—Urban Industrial (UI)
2. Property Ownership:	Submerged lands—DNR, Port, private Adjacent upland—City of Seattle, Port, private
3. Shoreline Condition:	Bulkheads, pier apron, rip-rap, finger piers, sheet piling, pocket beach, habitat restoration site
4. Shoreline Uses:	Warehouse, storage, berthing, marina
5. Proposed Uses:	Port may purchase small area of private property at northwest end of unit and may remove vertical bulkhead. Upland area would be used for container storage.
6. Navigation:	Moderate draft at north and south ends of unit, shallow water limits navigation at the bridge

7. Fishing Activities: Treaty fishing with river skiff gill nets
Recreational angling from public fishing pier

8. Habitat Type: Highly modified shoreline, some kelp south of bridge, two habitat enhancement projects

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)
Migration	— Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10. Physical Dynamics: Protected from waves, little vessel wake, moderate river flow current

11. Water Characteristics: Moderate water quality; storm drains

12. Sediment Characteristics: Quality—Probably poor
Type—Muddy, silty

UNIT NO. 14—KELLOGG ISLAND

Shift to wider navigable waterway and an area with greater habitat value and potential.

Boundaries: Duwamish Waterway from the south end of Harbor Island to the south side of Slip No. 1, including Kellogg Island.

Features:

1. Shoreline Designations: City of Seattle—Conservancy (CR, CP) and Urban Industrial (UI)

2. Property Ownership: Submerged lands—DNR, City of Seattle, Port, private
Note: DNR ownership is limited to the area within the waterway boundaries at the northern end of this unit. The Port owns the area within the waterway boundaries in the remainder of the unit. Submerged lands from the outer waterway boundary to the shoreline are

		under City of Seattle, Port, and private ownership. Adjacent upland—Federal, Port, private
3.	Shoreline Condition:	Over 50 percent is nonstabilized shoreline (primarily around Kellogg Island); remainder is bulkheads, pier apron, rip-rap, and finger piers
4.	Shoreline Uses:	Cargo transfer, industrial, warehouse, barge repair, habitat restoration and enhancement, GSA
5.	Proposed Uses:	Port planning effort[2] includes possible dryland marina (storage and launching), widening and deepening of waterway to 1st Avenue South Bridge (but current plan is **not** to proceed in near future), habitat restoration
6.	Navigation:	Deep draft in 30-ft channel, very limited navigation west of Kellogg Island
7.	Fishing Activities:	Treaty fishing with river skiff gill nets Recreational angling from the shore
8.	Habitat Type:	Intertidal flats, some fringing marsh, high salt marsh, forested upland, one habitat restoration project in progress and two planned, bulkheads, apron pier, rip-rap, finger piers

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rockfish, flatfish, smelt
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)
Migration	— Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)

10.	Physical Dynamics:	Boat wakes, river current, some sheltered areas on west side of Kellogg Island
11.	Water Characteristics:	Moderate water quality, several outfalls, major CSO

[2] The Port of Seattle is currently studying possible future planning and development activities. Additional uses may be proposed for properties along the Duwamish River as a result of this planning effort. A Port plan may be completed by the end of the year.

12. Sediment Characteristics: Quality—Some known areas of contamination
Type—Sandy in channel, then silty to shore

UNIT NO. 15—GEORGETOWN REACH

Shift to more intensely developed shoreline.

Boundaries: Duwamish Waterway from the south end of Slip No. 1 to the 1st Avenue South Bridge.

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI)

2. Property Ownership: Submerged lands—City of Seattle, Port, private
Adjacent upland—City of Seattle, Port, Muckleshoot Indian Tribe, private

3. Shoreline Condition: Bulkheads, pier apron, rip-rap, finger piers, one small sandy beach, some intertidal flats

4. Shoreline Uses: Industrial, ship repair, berthing, marina, warehouse, and storage

5. Proposed Uses: Support pier for tribal fisheries, 1st Avenue South Bridge expansion, partial filling of Slip 2, possibly other activities as part of Port planning effort

6. Navigation: Deep draft

7. Fishing Activities: Treaty fishing with river skiff gill nets (access at boat launch under 1st Avenue South Bridge)
Recreational angling from the shore (at the marina)

8. Habitat Type: Bulkheads, pier apron, rip-rap, finger piers, one small beach, one off-channel area with moderate restoration potential

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants), rock-fish, flatfish, smelt
Rearing	— Salmonids (out-migrants)

Holding	—	Salmonids (adult in-migrants)
Transition	—	Salmonids (smolt out-migrants)
Migration	—	Salmonids; rockfish, flatfish, smelt (seasonal); crab (spring-summer juveniles)
Minimal management	—	Rockfish, flatfish, smelt

10. Physical Dynamics: High boat wake energy, river current

11. Water Characteristics: Moderate water quality, many outfalls

12. Sediment Characteristics: Quality—Patchy contamination, moderate otherwise
Type—Sandy in channel, then silty to shoreline

UNIT NO. 16—SLIP 3/SLIP 4

Shift in waterway depth (now moderate depth).

Boundaries: 1st Avenue South to 8th Avenue South Reach of the Duwamish Waterway from the 1st Avenue South Bridge, including Slip No. 3 to the south end of Slip No. 4.

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI)

2. Property Ownership: Submerged lands—City of Seattle, Port, private
Adjacent upland—City of Seattle, private

3. Shoreline Condition: Bulkheads, pier apron, rip-rap, finger piers, some muddy beach

4. Shoreline Uses: Barge transfer, small industry, residential

5. Proposed Uses: None known

6. Navigation: Moderate to shallow depth

7. Fishing Activities: Treaty fishing with river skiff gill nets
Recreational angling from boats

8. Habitat Type: Bulkheads, pier apron, rip-rap, finger piers, extremely limited areas of natural muddy beach)

9. Habitat Use:

Function	Evaluation Species
Feeding	— Salmonids (out-migrants)
Rearing	— Salmonids (out-migrants)
Holding	— Salmonids (adult in-migrants)
Transition	— Salmonids (smolt out-migrants)
Minimal management	— Rockfish, flatfish, smelt

10. Physical Dynamics: Boat wakes, river current

11. Water Characteristics: Moderate water quality, several outfalls

12. Sediment Characteristics: Quality—Poor where sampled
Type—Sandy in channel, then silty to shoreline

UNIT NO. 17—SOUTH PARK

Shift in industrial use (little marine cargo traffic) and property ownership (largely private—Boeing).

Boundaries: Duwamish Waterway from south of Slip No. 4 at the north end of the South Park Reach south to, and including, Turning Basin No. 3 (to the head of navigation).

Features:

1. Shoreline Designations: City of Seattle—Urban Industrial (UI) and other outside City of Seattle

2. Property Ownership: Submerged lands—City of Seattle, Seattle City Light, City of Tukwila, King County, Port, private
Adjacent upland—Port, private

3. Shoreline Condition: Bulkheads, pier aprons, rip-rap, finger piers, some natural shoreline

4. Shoreline Uses: Residential, industrial, small marinas, limited tug-barge operations, vessel construction, recreational trail, Boeing manufacturing

5. Proposed Uses: Shift from manufacturing to R&D at Boeing facility will require redevelopment (building construction, removal of building on pilings); Green-Duwamish recreational trail

6. Navigation: Shallow draft

7. Fishing Activities: Treaty fishing with river skiff gill nets
Recreational angling from the shore and from boats

8. Habitat Type: Bulkheads, pier apron, rip-rap, finger piers, some intertidal flats, small stretch of relatively natural riparian habitat, small patches of fringing marsh, some links to upland forested areas

9. Habitat Use:

Function		Evaluation Species
Feeding	—	Salmonids (out-migrants)
Rearing	—	Salmonids (out-migrants)
Holding	—	Salmonids (adult in-migrants)
Transition	—	Salmonids (smolt out-migrants)
Minimal management	—	Rockfish, flatfish, smelt

10. Physical Dynamics: Moderate amount of boat wakes, river current, sediment settling at turning basin

11. Water Characteristics: Moderate water quality, over 50 outfalls

12. Sediment Characteristics: Quality—Moderate to good becoming cleaner moving south and known to be clean at the turning basin
Type—Sandy

DESCRIPTION OF ABBREVIATIONS

Urban Industrial (UI)	Special use for water-dependent use
Conservancy Navigation (CN)	Conditional use for habitat enhancement
Conservancy Preservation (CP)	Conditional use for habitat enhancement
Conservancy Recreation (CR)	Special use for habitat enhancement
Conservancy Management (CM)	Special use for habitat enhancement
Urban Residential (UR)	Special use for habitat enhancement
Urban Stable (US)	Special use for habitat enhancement
Urban Harborfront (UH)	Special use for water-dependent use
Urban General (UG)	Special use for water-dependent use (D2) or habitat enhancement (D3)

APPENDIX D

Meeting Minutes
(available on request from the Washington Department of Natural Resources)