

**Environmental Assessment
Commencement Bay, Washington: Wasser/Winter,
Nursery, and Meeker Restoration Projects**

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**Environmental Assessment (EA)
Commencement Bay, Washington Wasser/Winter,
Nursery, and Meeker Restoration Projects**

LEAD FEDERAL AGENCY FOR EA: National Oceanic and Atmospheric Administration (NOAA)

COOPERATING FEDERAL AGENCY FOR EA: U.S. Fish and Wildlife Service (U.S. Department of the Interior)

STATE ENVIRONMENTAL POLICY ACT (SEPA) LEAD AGENCY: City of Tacoma

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ABSTRACT: This EA has been prepared for the Wasser/Winter, Nursery, and Meeker restoration projects to disclose potentially significant impacts to the human environment associated with restoration of natural resources in Commencement Bay, Washington.

The Wasser/Winter and Nursery projects generally consist of restoration of intertidal habitat through re-grading and replanting of previously disturbed sites. The Wasser/Winter site is approximately 2.3 acres, while the Nursery site comprises approximately 0.66 acres. A “no action” alternative is proposed for the Meeker site.

ADMINISTRATIVE RECORD:

Copies of the EA may be reviewed at the following locations:

Tacoma Public Library
Downtown Branch
1102 Tacoma Avenue South
Tacoma, WA 98402
(253) 591-5666

Citizens for a Healthy Bay
917 Pacific Avenue, Suite 406
Tacoma, WA 98402
(253) 383-2429

Copies of the EA are also available for download at:
<http://www.darcnw.noaa.gov/projects/htm>.

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Executive Summary

This Environmental Assessment was prepared under the requirements of the National Environmental Policy Act to disclose potentially significant impacts to the quality of the human environment from implementation of the preferred alternative for three habitat restoration projects in Commencement Bay, Tacoma, Washington.

Three projects are proposed by the Commencement Bay Natural Resource Trustees under their Natural Resource Damage Assessment Restoration Plan. The projects are the Wasser/Winter project, the Nursery project, and the Meeker project, and restoration would occur at three separate but functionally related sites. The projects would re-create lost intertidal habitat for a variety of plants and animals and provide particular benefit for juvenile salmonids, including chinook salmon, which are listed as "threatened" under the federal Endangered Species Act.

Based on a review of the environmental impacts associated with the proposed alternatives, the Trustees solicited public input and identified a preferred restoration alternative for each of the three sites.

The preferred Wasser/Winter site alternative would restore/enhance estuarine habitat, increase off-channel habitat for juvenile salmonids, and provide landscape connectivity with a Washington State Department of Transportation mitigation site just upstream on Hylebos Creek. The project includes removal of existing fill material to create permanently flooded backwater pools and tideflats and provide a natural gravel substrate. A salt marsh would be planted at an elevation near mean higher high water on gently sloping surfaces. To the extent feasible, the salt marsh would be tied in elevation to the historical tideflats.

The Nursery site's preferred alternative includes expanding an area supporting intertidal vegetation by grading an area north of the existing vegetation line. The project would improve juvenile salmonid habitat by enhancing nearshore vegetated shallows essential for feeding, seawater acclimation, migration guidance and refuge from predators. Runoff from a hillside on the north side of Marine View Drive, which forms the site's eastern boundary, would be intercepted and routed through the project site in a dendritic channel pattern. The fresh water would lower salinity and encourage growth of species that tolerate brackish conditions. Intertidal and riparian vegetation would be enhanced. Excavated materials would be shaped into a berm next to the adjacent Marine View Drive to discourage trespassers from entering the site.

For the Meeker site, the Trustees selected the No Action alternative as the preferred alternative. Due to the exposure of the site to high wave energy, the Trustees determined that the probability of success for proposed restoration alternatives on the site was low. In addition, the Trustees determined that subtidal habitat on the site was in good condition and offered only marginal opportunities for enhancement. As a result, the Trustees determined that leaving the site in its current condition, and monitoring the site, was most consistent with the goals of the Plan.

The projects would not result in any significant adverse environmental impacts. Both action alternatives would result in temporary, localized construction-related impacts to water quality and air quality, and temporary increases in noise from the use of construction equipment. Because of their short duration and localized nature, these impacts would not be significant. Over the long-term, the restoration projects would benefit fish and wildlife, help to protect and improve water quality, and enhance the visual quality of the project area. Taken together, the three projects would provide functional connectivity among all three sites by maintaining, creating, or restoring a diversity of nearshore habitat used by juvenile salmonids for feeding, rearing, and outmigration.

1.0 Introduction: Purpose of and Need for Restoration

1.1 Overview

Commencement Bay is the harbor for Tacoma, Washington, occupying about 5,700 acres in south Puget Sound. In 1981, the federal Environmental Protection Agency (EPA) placed the Bay on a national interim list of the 115 highest priority hazardous waste sites due to elevated concentrations of hazardous substances. The Bay and its surrounding environment are heavily urbanized and serve as an industrial and commercial activity center. Based on a remedial investigation/feasibility study, the EPA and Washington Department of Ecology (Ecology) issued a record of decision in 1989 that identified contaminated sediment problem areas in the Bay that have elevated concentrations of chemicals of concern (EPA, 1989).

In a related process, a group of federal and state agencies and tribes, called the Commencement Bay Natural Resource Trustees (Trustees), are conducting a natural resource damage assessment (NRDA).¹ The damage assessment is being performed to determine the extent of injuries to the Bay's fish, shellfish, sediments, and water from the release of hazardous substances or the discharge of oil. The Trustees are also conducting a parallel planning process to determine the best approach to restoring, replacing, rehabilitating, or acquiring the equivalent of the injured natural resources and/or services.

The Trustees consist of the following agencies and tribes: The National Oceanic and Atmospheric Administration (NOAA) of the U.S. Department of Commerce; the U.S. Department of the Interior, including the U.S. Fish and Wildlife Service (USFWS) and the Bureau of Indian Affairs; the Washington Department of Ecology (Ecology, as lead state Trustee); the Washington Department of Fish and Wildlife (WDFW); the Washington Department of Natural Resources (WDNR); the Puyallup Tribe of Indians; and the Muckleshoot Indian Tribe.

The primary study area for the Trustees' NRDA restoration activities encompasses 25 square miles of Commencement Bay and the immediate surrounding area where injury to natural resources of concern primarily has occurred. This planning process has been used to determine the best approach to restoring, replacing, rehabilitating, and/or acquiring the equivalent natural resources and/or services injured. Building on the work of a restoration panel, the Trustees prepared a NRDA Restoration Plan and Programmatic Environmental Impact Statement (RP/EIS) to guide restoration project site selection, design and development. The Trustees formally adopted the Restoration Plan (Plan) in October 1997 (Trustees, 1997). The Plan includes a combination of projects designed to provide maximum benefit to Commencement

¹ The NRDA is being conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 USC 9601 et seq.; the Oil Pollution Act of 1990 (OPA), 33 USC 2701-2761; and other applicable laws.

Bay's injured natural resources and services in accordance with the goals and objectives of the Trustees, and is incorporated here by reference. The Plan's objectives include:

- Provide a functioning and sustainable ecosystem where selected habitats and species of injured fish and wildlife will be enhanced to provide a net gain of habitat function beyond existing conditions;
- Integrate restoration strategies to increase the likelihood of success;
- Coordinate restoration efforts with other planning and regulatory activities to maximize habitat restoration; and
- Involve the public in restoration planning and implementation.

1.2 Purpose and Need

This Environmental Assessment (EA) was prepared under the requirements of the National Environmental Policy Act (NEPA)² to determine whether or not there would be significant impacts to the quality of the human environment from implementation of the preferred environmental restoration alternatives selected at each site. This EA includes a project-specific environmental review of three projects, incorporating by reference the RP/EIS (Trustees, 1997). NOAA is the lead agency for purposes of this EA. The other Commencement Bay Natural Resource Trustees are cooperating agencies. This EA has also been prepared to be consistent with the Washington State Environmental Policy Act (SEPA)³ (see Appendix A). The City of Tacoma has assumed lead agency status for the purposes of SEPA.

The Wasser/Winter, Nursery, and Meeker restoration projects were selected in accordance with the criteria set forth in Section 3.1 below. Because these projects have a common purpose to maintain, enhance, and re-create intertidal habitat for injured fish and wildlife, particularly juvenile salmonids, and are functionally- interrelated, the Trustees determined that the evaluation of the alternatives and their environmental impacts were similar enough in nature and scope that they could be addressed together in this EA. The salt marshes and tidal mudflats that once covered extensive areas of Commencement Bay have been substantially degraded over time due to industrial and commercial development and activity. The loss of intertidal mudflats, tidal marsh habitats, and other habitat features has reduced populations of many plants and animals; decreased benthic production; and degraded habitat for anadromous salmonids, demersal fish, clams, crabs, and shrimp. Shoreline areas of the Bay are used by juvenile salmon for rearing, by adult salmon as migration routes, and by forage fish for spawning. Nearshore areas are also used by migratory and resident birds as resting and feeding areas. Since high quality habitats have become scarce throughout the Bay, restoring these areas is important for the overall health and function of the Bay's ecosystems. Of particular importance is the improvement of habitat for

² NEPA, 42 USC 4321 et seq., 40 CFR Parts 1500-1508, and requirements set out in NOAA's Administrative Order 216-6.

³ SEPA, Ch. 43 RCW; Ch. 197-11 WAC.

chinook salmon (*Oncorhynchus tshawytscha*) because they are listed as threatened in Puget Sound under the federal Endangered Species Act.⁴

The three projects would maintain or improve habitat for juvenile salmonids. The Wasser/Winter and Nursery projects would increase areas for rearing and feeding, enhance conditions for prey resources, and reduce stress from elevated water temperatures and suspended sediment loads. All three projects are located in the eastern shoreline Habitat Focus Area (HFA) as identified in the Plan. The area is suitable for restoration because, among other criteria, it is used as a migratory route for salmonids, waterfowl and shorebirds, and it contains one of the largest areas of original tideflats remaining in the Bay. In combination, the projects would re-create or enhance over four acres of intertidal habitat through re-grading, restoration of intertidal vegetation and enhancement of substrate.

The lead federal agency and the other Trustees will be monitoring these three projects to ensure that any potential environmental impacts that may arise during the course of project development are addressed.

1.3 Public Participation

The Trustees have provided numerous opportunities for the public to comment on the overall Plan, and to comment on the conceptual designs for the Wasser/Winter, Nursery, and Meeker projects. The Trustees hold quarterly public briefings, and public meetings are held throughout the year depending on the need. For the three projects analyzed in this EA, a public meeting was held in March 1999 to solicit comments on conceptual restoration designs and to help the Trustees select preferred designs for each project site. The Trustees envision ongoing public involvement in a monitoring and stewardship role. Public opportunities to comment on the scope and design of the projects will also be available through the federal and state permitting process that may be required for these projects.

1.4 Administrative Record

This EA references a number of resource documents prepared by and for the Trustees and through the NEPA and SEPA processes. These documents, incorporated by reference into this EA, are part of the administrative record on file for these projects with the lead federal agency and may be viewed at:

⁴ ESA, 16 USC 1531 et seq. National Oceanic and Atmospheric Administration. Final Rule: Threatened Status for Three Chinook Salmon Evolutionarily Significant Units in Washington and Oregon, and Endangered Status of One Chinook Salmon Evolutionarily Significant Unit in Washington. 64 Fed. Reg. 14307-1529 (March 24, 1999).

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2.0 Affected Environment

Commencement Bay, located at the southern end of Puget Sound, is an estuarine bay of approximately 5,700 acres comprised of a variety of shoreline areas, intertidal areas and waterways. The Bay serves as the port harbor for the City of Tacoma. Beginning around the turn of the century, intertidal areas and tideflats were filled in and meandering streams were channelized to allow for industrial and commercial development. This development has resulted in the present configuration of eight waterways (Hylebos, Blair, Sitcum, Milwaukee, St. Paul, Middle, Thea Foss, and Wheeler-Osgood) leading into the Bay. The Wasser/Winter, Nursery, and Meeker projects are located on or near the Hylebos Waterway (Figure 1).

The Commencement Bay area provides habitat for a variety of fish and wildlife. Fish and wildlife populations in Commencement Bay are described in greater detail in the RP/EIS, Appendix A. The three restoration sites, though modified, provide some habitat for intertidal fish and wildlife including salmonids (chinook, coho, chum, and pink salmon as well as steelhead trout), flatfish, epibenthic macroinvertebrates, benthic infaunal invertebrates (polychaetes and bivalves), epibenthic invertebrates (amphipods), benthic macroinvertebrates (decapods and echinoderms), birds, and mammals. In particular, mudflats provide feeding habitat for salmonids, crabs, flatfish, invertebrates as well as cover, feeding, nesting, and habitat corridors for waterfowl, wading birds, diving birds, harbor seal, raccoon and opossum. Emergent marsh and estuarine areas provide particularly valuable habitat for juvenile salmonids (Trustees, 1997).

2.1 Size and Location of Projects

2.1.1 Wasser/Winter Site

The Wasser/Winter site is located in the City of Tacoma between Marine View Drive and the lower turning basin of the Hylebos Waterway (Figure 1). The project site is located on property owned by the Port of Tacoma near the tidally influenced mouth of Hylebos Creek where the creek drains into the Hylebos Waterway. Upland areas of the project site encompass a flat area vegetated with grasses and shrubs adjacent to a highly channelized portion of the creek. The site itself extends northeast from the centerline of the creek to a fence that bounds an asphalt cap installed by the Port of Tacoma, and seaward to the pierhead line in the turning basin. A log storage yard borders the site to the west across Hylebos Creek, while a large parking area borders the site to the east. Immediately south of the site is a bridge where State Route (SR) 509 crosses the Hylebos Creek. The site dimensions are approximately 1,000 by 100 feet, totaling about 2.3 acres. Soils are characterized as being sandy/silt dredge fill overlying pre-development tideflats.

The upland portion of the Wasser/Winter site is used by birds, notably Canadian geese, for nesting and feeding. There are limited occurrences of salt marsh vegetation on the banks of Hylebos Creek and on the edges of the log-loading ramp. The extent of this vegetation is limited by unsuitable substrate and by the condition of the stream banks, which are steep and subject to slumping.

Upstream of the SR-509 bridge over Hylebos Creek is a compensatory mitigation site completed by the Washington State Department of Transportation (WSDOT) comprised of two acres of intertidal marsh surrounded by two acres of riparian vegetation. Further upstream of the WSDOT project site, Hylebos Creek contains riparian and riverine habitat for a variety of anadromous and resident fish, birds and small mammals. The Puyallup Tribe stocks Hylebos Creek with chum, coho and pink salmon. The nearshore area and Hylebos Waterway are used extensively as rearing and feeding habitat by numerous marine species, and as a migratory pathway for salmonids. The Hylebos Waterway is also extensively used for industrial and commercial activities

2.1.2 Nursery Site

The Nursery site is located waterward of Marine View Drive near the middle of the Hylebos Waterway on property owned by the Puyallup Tribe (Figure 1). The site is approximately 360 by 80 feet, or 0.66 acres, and contains some hardwood trees, blackberry bushes, and a strip of intertidal marsh vegetation approximately three to four feet wide. The site contains salt marshes and low-gradient mudflats that provide habitat for benthic, or bottom-dwelling organisms important to the food chain. These organisms are of particular importance to shorebirds and juvenile salmon. The site contains several pilings, logs and pieces of downed wood indicative of previous log storage activities in the area.

The general area around the project site includes narrow intertidal and subtidal margins broken by commercial marinas and log storage activities. To the north of Marine View Drive is a woody, steep-sloped area. East and west of the site are additional intertidal and mudflat areas that have been designated as natural resource conservancy areas by the Puyallup Tribe. The project is situated in a portion of the Bay containing the largest area of original mudflats. The Bay's eastern edge is also an important migratory route for salmonids, waterfowl and shorebirds.

2.1.3 Meeker Site

The Meeker site is located north and east of the Nursery site, waterward of Marine View Drive. The Meeker site is the smallest of the three sites, encompassing approximately 0.25 acres. The site contains a small upland area dominated by invasive plant species and a small area of cobble beach. The shoreline of the site consists of a bank approximately three feet high. The steep nature of the bank suggests that it is actively eroding. Erosion of the bank tends to nourish the beach, which is recognized as an important function in developed areas of the Puget Sound shoreline. A pipe conveying stormwater from an adjacent hillside discharges on the site just below the ordinary high water mark.

Residential properties are present to the north and south of the Meeker site. A steep wooded hillside is located to the east of the site adjacent to Marine View Drive.

3.0 Description of Alternatives

3.1 Selection and Assessment Criteria

The Wasser/Winter, Nursery, and Meeker sites are among the first group of sites selected by the Trustees for restoration in accordance with the Plan. All three sites were selected by a Commencement Bay Restoration Panel after a thorough screening of potential sites through site visits and review of aerial surveys. In the preliminary inventory of potential restoration sites conducted as part of the Plan, all three sites were given a “high” priority ranking. Briefly, this ranking was based on several factors including the availability of the site for restoration, the ability to provide adequate source control, and the likelihood that the site would provide functional benefits to injured natural resources. The panel gave greater weight to sites benefiting multiple species and having functional connectivity to other existing or potential habitat sites. Location and cost-effectiveness were also factors of high importance in the site screening and selection process. Pages 3-3 to 3-6 of the Plan provide additional details on the screening process.

3.1.1 NEPA Intensity Factors

The Panel also evaluated another tier of factors prior to selecting suitable sites for restoration. These factors, related to the severity (significance) of the potential impacts (see 40 CFR, 1508.27) included:

1. Impacts that may be both beneficial and adverse.
2. Degree to which the project affects public health and safety.
3. Unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, etc.
4. Degree to which the effects on the quality of the human environment are likely to be highly controversial.
5. Degree to which possible effects of implementing the project are highly uncertain or involve unique or unknown risks.
6. Degree to which the action establishes a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
7. Individually insignificant but cumulatively significant impacts.
8. Degree to which the action adversely affects entities listed or eligible for listing in the National Register of Historic Places, or may cause loss or destruction of significant scientific, cultural, or historic resources.
9. Degree to which endangered or threatened species, or their habitat, are adversely affected by the project.

10. Whether the action threatens a violation of federal, state, or local law or requirements imposed by the protection of the environment.

3.2 Selection of the Preferred Alternative

During the conceptual design process the Trustees and a consultant team held a number of meetings and work sessions to identify possible restoration designs for the Wasser/Winter, Nursery, and Meeker sites. Initially, several restoration options were explored given each site's location, condition and potential habitat function. This range of alternatives was narrowed to two action alternatives and a no action alternative for the Wasser/Winter and Nursery sites, and three action alternatives and a no action alternative for the Meeker site. Input was solicited from the public to select a preferred restoration design for each site.

The Trustees reviewed a variety of factors to select a preferred alternative for each site. Public input was reviewed to determine public preferences for restoration on each site. The Trustees also evaluated the ability to maximize ecological benefits and restore habitat functions and the probability of success given both onsite and surrounding conditions. In addition to providing the greatest restoration value and offering the greatest likelihood for success, the Trustees selected preferred alternatives that would minimize adverse environmental impacts through implementation of best management practices and other measures during construction. The following sections describe the preferred alternative for each project site.

The alternatives, including the preferred alternatives, for the Wasser/Winter, Nursery, and Meeker sites are discussed below. Table 1 provides a comparative evaluation of key issues by alternative for each site.

3.2.1 Wasser/Winter Site

3.2.1.1 Alternative 1 (Not Selected)

Alternative 1 was the first of the two designs for the Wasser/Winter site that was presented to the Trustees and the public. It includes the creation of intermittently flooded, shallow off-channel flats or marsh areas containing a natural gravel substrate (Figure 2). Permanently flooded flow-through channels along with intermittently flooded side channels would also be created, and riparian vegetation restored. The channel pattern would increase edge length to provide salmonid passage and habitat. This alternative emphasizes fish passage, feeding in smaller channels and resting in the smallest channels.

This alternative was determined to be infeasible due to the steep slope that would be required to create the permanently flooded channels. Additionally, this alternative would be more expensive than Alternative 2 due to additional excavation requirements. Implementation of this alternative would result in temporary impacts to water quality and fish and wildlife resources from increased turbidity during construction, but would result in long-term improvements in fish and wildlife habitat. The project would enhance habitat for chinook salmon. Cultural resources could be

disturbed during construction, although the site has been previously modified and there are no known cultural resources on the site. There is no public access to the site, and public access would be limited to monitoring and stewardship activities once the project is completed. Recent investigations did not identify any contaminated soils on the site.

3.2.1.2 Alternative 2 (Preferred)

The preferred alternative designated by the Trustees (Alternative 2) emphasizes resting and feeding habitat for juvenile salmonids in backwater pools (Figure 3). The Wasser/Winter site would provide approximately 2.3 acres of intertidal habitat by excavating approximately 17,700 cubic yards of material to create three permanently flooded backwater pools and tideflats with natural substrate. A salt marsh would be planted with sedges, saltgrass, pickleweed, rush, and arrowgrass at an elevation near Mean Higher High Water (MHHW) on gently sloping surfaces and would be tied elevationally into the historical tideflats to the extent feasible. Upland vegetation would be restored with plantings of red alder, black cottonwood, Douglas fir, and a variety of understory shrubs. The project's goal is to restore/enhance estuarine habitat, maximize residence time for juvenile salmonids in pool habitat, and provide landscape connectivity with a WSDOT mitigation site just upstream on Hylebos Creek. Compared to other alternatives evaluated, this alternative would also provide a greater reduction in water velocities, greater water surface area, and more edge area.

Compared to the other action alternative for the Wasser/Winter site (Alternative 1), implementation of the preferred alternative would result in similar impacts to water quality and fish and wildlife resources from increased turbidity during construction. Less excavation would be required for the preferred alternative, however, resulting in slightly less impact. The project would result in long-term improvements in fish and wildlife habitat, including habitat for chinook salmon. Cultural resources could be disturbed during construction, although the probability is slightly lower compared to Alternative 1 because there would be less excavation. There is no public access to the site, and public access would be limited to monitoring and stewardship activities once the project is completed. Recent investigations did not identify any contaminated soils on the site.

3.2.1.3 Alternative 3 (Not Selected)

Under Alternative 3, the No Action alternative, the project would not be constructed. Over the short-term, the project site would remain in its presently modified condition, which would continue to provide poor intertidal habitat due to the simplified creek channel and lack of off-channel and shallow intertidal areas. Over the long-term, the site could be redeveloped or restored by the Port of Tacoma, which could result in additional adverse impacts to water quality, fish and wildlife resources, and cultural resources depending on the nature of the site development. Such redevelopment also may or may not provide for additional public access. This alternative was determined to be inconsistent with the Plan's habitat restoration goals.

3.2.2 Nursery Site

Similar to the Wasser/Winter site, the Trustees evaluated three action alternatives for the Nursery site after a review of several restoration options. The two action alternatives carried forward shared the goal of expanding the area supporting intertidal vegetation by grading the area north of the existing vegetation line, and increasing the production of native estuarine plants to benefit fish and wildlife and fulfill the secondary, long-term objective of providing seed and plant stock for restoration projects elsewhere in Commencement Bay.

3.2.2.1 Alternative 1 (Not Selected)

Alternative 1 for the Nursery site would entail creation of a series of ponds using redirected fresh water from two small streams flowing on to the site, and additional estuarine marsh plantings (Figure 4). Addition of a gravel substrate to create interstices for invertebrates and juvenile salmonids was a potential component of the project depending on the nutrient availability of the existing material.

Alternative 1 was not selected for the Nursery site because it provides less area for salt marsh vegetation by including pools. The Trustees believed that the value of additional vegetation was more important than the limited habitat potential provided by small pools. Implementation of the project would result in short-term, localized impacts to water quality and fish and wildlife resources from increased turbidity during construction. The project would result in long-term improvements in fish and wildlife habitat, including nearshore habitat for chinook salmon. Cultural resources could be disturbed during construction, although no cultural resources are known to exist on the site. Public access and use of the site is presently limited, and public access would be limited to monitoring and stewardship activities once the project is completed. There are no known contaminated soils on the site.

3.2.2.2 Alternative 2 (Preferred)

Alternative 2, the preferred alternative designated by the Trustees, entails construction of a more dendritic channel pattern in place of the ponds considered in the second action alternative for the site. The project would restore approximately 0.66 acres of intertidal habitat by excavating about 2,000 cubic yards of material and grading an area north of the existing vegetation line. An intertidal vegetation community would be restored through plantings of sedges, saltgrass, pickleweed, rush, and arrowgrass (Figure 5). Upland areas would be planted with red alder, Douglas fir, black cottonwood, and a variety of understory species. Runoff from the hillside on the north side of Marine View Drive, which forms the eastern project boundary, would be intercepted and routed through the project site in a dendritic channel pattern. Fresh water inputs would lower salinity and encourage growth of species that tolerate brackish conditions. Substrate enhancement may be a component of the project depending on the nutrient availability of the existing materials. Excavated materials would be shaped into a berm next to Marine View Drive to discourage trespassers from entering the site.

Compared to Alternative 1, implementation of the preferred alternative would result in similar impacts to water quality and fish and wildlife resources from increased turbidity during construction. The project would result in long-term improvements in fish and wildlife habitat, including habitat for chinook salmon. Cultural resources could be disturbed during construction, similar to the other action alternative. There is limited public access and use of the site, and public access would be limited to monitoring and stewardship activities once the project is completed. There are no known contaminated soils on the site.

3.2.2.3 Alternative 3 (Not Selected)

Under the No Action alternative, the project would not be implemented. Over the short-term, the project site would remain in its presently modified condition, which provides poor intertidal habitat due to the steep profile of the shoreline and modified condition of vegetation communities. Over the long-term, the site could be redeveloped or restored by the Puyallup Tribe, which could result in additional adverse impacts or benefits to water quality, fish and wildlife resources, and cultural resources depending on the nature of the project. Such redevelopment also may or may not provide for additional public access. This alternative was determined to be inconsistent with the Plan's habitat restoration goals, similar to the Wasser/Winter site.

3.2.3 Meeker Site

3.2.3.1 Alternatives 1-3 (Not Selected)

For the Meeker site, four alternatives initially evaluated by the Trustees sought to enhance nearshore area and intertidal habitat, enhance salmonid use of the area, and incorporate the erosional nature of the site into the project. Alternative 1 sought to create a stable bank with overhanging willows to provide shade and food for migrating salmonids. Alternative 2 would create a freshwater wetland to act as a food source for salmonids. Alternative 3 was intended to maximize intertidal marsh habitat and create a freshwater habitat to sustain migrating salmonids.

3.2.3.2 Alternative 4 (Preferred)

Alternative 4, the No Action Alternative, was selected as the preferred alternative. After consultations among the Trustees, the public, and the design team, it was determined that, given the rate of erosion at the site and the current quality of the subtidal habitat, that none of the action alternatives were consistent with the Trustees' restoration goals and that a more conservative approach would be more prudent at this time. Monitoring of the site would be continued to determine whether restoration intervention by the Trustees would be needed.

3.2.4 Monitoring and Adaptive Management

Ongoing project monitoring and adaptive management will be important components for all of the projects. Together, NOAA and the other Trustees will monitor the restoration sites to evaluate success of the projects, and to identify and address any potential environmental impacts that may arise.

A monitoring plan will be developed for each project site. In addition to being consistent with permit requirements, monitoring will be used to determine if projects are meeting restoration goals, to establish whether adjustments are needed to meet those goals, to provide information to improve the design and implementation of future projects, and to determine if additional construction or plantings are needed. The Trustees will also consider how the public could contribute to implementing the monitoring program.

4.0 Environmental Consequences: Direct, Indirect or Cumulative Impacts

Because the No Action alternative was selected for the Meeker site, only the Wasser/Winter and Nursery sites are discussed below. The Wasser/Winter and Nursery sites are discussed together because, under the preferred alternatives, environmental impacts potentially resulting from each project are similar in scope due to their proximity to each other and the design of the projects. Any potential adverse impacts at each restoration site would be short-term and construction-related in nature. The magnitude of these impacts would generally be a function of the extent and duration of construction. Appropriate plans would be implemented to minimize these short-term impacts and the project will be in compliance with all applicable local, state, and federal permits and approvals.

4.1 Aesthetic and Light/Glare Impacts

Habitat at both the Wasser/Winter and Nursery sites has been extensively modified and simplified due to past industrial and commercial activity in the area. At the Wasser/Winter site, the stream channel has been straightened, and the site largely overtaken by non-native plant species. The Nursery site, while apparently less extensively modified, also exhibits signs of modification. At both sites, natural habitat conditions would be restored through re-grading and re-vegetation. Although the project would result in short-term aesthetic impacts during earth-moving activities, restoration would help restore native vegetation communities and habitat, which would improve aesthetic conditions over the long-term. Views of the sites and their surrounding area from property adjacent to the sites would not be adversely impacted. At the Nursery site, excavated soil would be used to create a berm along Marine View Drive, which would modify existing views from the roadway. This berm would be planted with riparian vegetation; no significant visual impacts would occur.

There would be no light and glare produced by the finished restoration projects, as lighting would not be provided. Lighting from the surrounding parcels would not impact the project sites, as the sites would not be occupied nor provide nighttime recreational opportunities.

4.2 Air Quality

During the construction phase at each site, there would be minimal short-term increases in dust and vehicle exhaust from earth moving activities (e.g. clearing, grubbing, dredging, soil and sediment transport, planting) and operation of construction equipment. Construction is expected to last approximately 4 to 8 weeks at each site, and construction is expected to occur at approximately the same time. No significant impacts are expected due to the relatively small amounts of excavation; the temporary nature of construction activities; and the lack of sensitive receptors such as residences, schools, or parks immediately surrounding each site. Exhaust controls would be used on all construction equipment to minimize exhaust emissions. Dust would be controlled by watering down exposed earth. Only the Wasser/Winter site would

require transport of earth off-site. Haul trucks would be covered or have loads that are below sideboards to control blowing dust along the haul route. A grading permit would be required from the City of Tacoma for construction at the Wasser/Winter site, which would require implementation of practices to control dust.

4.3 Connected Actions

The Plan focuses on restoring various habitat components such as vegetated shallows, mudflats and salt marshes, off-channel sloughs and lagoons, tidal creeks, freshwater marshes, upland buffers, and creek and river channel corridors in Commencement Bay. This framework recognizes the value of restoration through a landscape ecology approach, rather than creating isolated fragments of habitats. As a result, each distinct restoration project, including the three projects analyzed in this EA, is intended to provide functional connectivity with other projects by maintaining, creating, or restoring a diversity of nearshore habitat used by juvenile salmonids for feeding, rearing, and outmigration.

The Wasser/Winter site extends northeast from the centerline of the creek to a fence that bounds an asphalt cap installed by the Port of Tacoma, and seaward to the pierhead line in the turning basin. A log storage yard borders the site to the west across Hylebos Creek, and a large parking area borders the site to the east. Immediately south of the site is a bridge where State Route (SR) 509 crosses the Hylebos Creek. Restoration of the site would not result in any adverse impacts to any of these sites, and would provide connectivity with a WSDOT wetland mitigation site located south of the SR 509 bridge. While there are no known proposals for changes in use on property surrounding the Wasser/Winter site, such land use changes could adversely impact the Wasser/Winter site through increased runoff, shading, or human activity. Any changes in adjacent land use will be evaluated as part of the Trustees' monitoring program. Currently, logs are temporarily stored in the head of the Hylebos Waterway. The logs often block the mouth of Hylebos Creek and may disrupt the intended continuity of the restoration projects unless the log handling and storage practices are modified.

The general area around the Nursery site includes narrow intertidal and subtidal margins broken by commercial marinas and log storage activities. To the north of Marine View Drive is a woody, steep-sloped area. East and west of the site are additional intertidal and mudflat areas that have been designated as natural resource conservancy areas by the Puyallup Tribe. Restoration of the site would not result in any adverse impacts to adjacent land uses. While there are no known proposals for changes in use on property surrounding the Nursery site, such land use changes could adversely impact the Nursery site through increased runoff, shading, or human activity, similar to the Wasser/Winter site. Any changes in adjacent land use will be evaluated as part of the Trustees' monitoring program.

4.4 Controversial Impacts

The restoration projects would pose no uncertain or controversial risks. No contaminated soils were identified during recent investigations of soil conditions at the Wasser/Winter site. Participants in the public meetings and briefings have indicated support for these restoration

projects and have participated in the evaluation of the proposed alternatives, including the selection of the preferred alternative.

4.5 Cumulative Impacts

The proposed restoration projects are part of an overall Plan. A number of other NRDA restoration projects are being planned and designed under a landscape ecology framework (Figure 6). These completed restoration projects would, on a cumulative basis, contribute to Commencement Bay's overall environmental health, particularly in combination with other remediation and habitat enhancement projects in Commencement Bay. Salmon habitat would be improved, which would have a positive cumulative impact not only to Commencement Bay salmon stocks but also to salmon stocks in Puget Sound. The projects would provide functional connectivity with other restoration projects in Commencement Bay by maintaining, creating, or restoring a diversity of nearshore habitat used by juvenile salmonids for feeding, rearing and outmigration.

Because both sites would be constructed either simultaneously or sequentially, some cumulative construction impacts related to noise and transport of construction equipment could occur. However, construction would be short-term (less than eight weeks), and only small amounts of soil would be transported off-site from the Wasser/Winter site. As a result of their short-term and localized nature, the potential contribution of the projects to any adverse cumulative impacts is minor. The projects will be in compliance with all state and federal permit conditions.

4.6 Economic Impacts

No significant impacts on neighborhoods or community cohesion would occur. Both restoration projects would improve vacant, disturbed land by restoring biological diversity and ecological functions, and would increase community awareness about natural resources. Both projects could preclude future commercial or industrial development on each site, but such economic impacts would likely be offset by economic benefits tied to the improvement of environmental quality. As a result, values of adjacent property should not be adversely affected. The Port of Tacoma owns the Wasser/Winter site, while the Nursery site is on Puyallup Tribal land. Both sites are uninhabited. There would be no land acquisition or displacement required and housing would not be affected. No job losses are expected to occur.

4.7 Endangered Species/Threatened Species and Critical Habitat

A fall run of chinook salmon, which is listed as a threatened species under the federal Endangered Species Act, inhabits the Hylebos Creek system and its tributaries during its life cycle. Juvenile chinook also inhabit nearshore areas near both project sites. The proposed restoration projects would provide additional intertidal and nearshore habitat for chinook salmon, and may benefit other listed species in the area such as bald eagle. During construction, short-term impacts to salmon habitat could occur from excavation and earth-moving activities, resulting in increased turbidity and total suspended solids. However, through avoidance of

construction during chinook migration periods and implementation of methods to control erosion and in-water turbidity, short-term impacts to listed species would be relatively minor. Appendices C (letters) and D (Biological Evaluation) provide copies of the informal Section 7 ESA consultation with the NMFS and the USFWS. State consultations applicable to these projects can be found in the RP/EIS.

4.8 Energy

During the construction phase of both projects, construction equipment would use fossil fuels for energy. Energy use would be temporary. Energy needs for the completed projects are expected to be minor, limited primarily to ongoing monitoring and management.

4.9 Fish and Wildlife Impacts/Essential Fish Habitat (EFH)

Over the long-term, no fish or wildlife habitat would be adversely impacted by the proposed projects. Soil excavation would only occur during designated time periods to avoid salmonid migration periods. Minor disturbances to waterfowl and mammals would occur during the construction phase and may cause them to temporarily relocate, but these impacts would be short-term in nature.

Over the long-term, the proposed restoration projects would increase biological diversity and improve fish and wildlife habitat structure and function on each site. Juvenile anadromous salmonids would benefit from increased habitat quantity and quality. The projects would enhance resting areas for rearing and feeding, increase prey species and reduce environmental stresses from elevated water temperatures and suspended sediment loads.

The locations of the restoration sites are designated by the City of Tacoma as critical areas. According to Tacoma Municipal Code (TMC) Chapter 13.11, Critical Areas Preservation, a review of development activity shall occur during the Shoreline Permit review process. A separate critical areas permit is not required. Because both sites provide salmonid habitat, including habitat for chinook salmon (a threatened species), they are classified as fish and wildlife habitat conservation areas. Restoration would be consistent with City regulations for such areas.

Federal laws pertaining to fish and wildlife and essential fish habitat will be followed to ensure that no long-term adverse impacts would result from any selected alternative.⁵ Appendices C (consultation letter) and D (Biological Evaluation) provide the EFH consultation with the National Marine Fisheries Service regarding the Pacific Coast Groundfish estuarine composite EFH. The project will be in compliance with all state and federal permit conditions.

⁵ Magnuson-Stevens Fishery Conservation and Management Act, 16 USC 1801 *et seq.*, 50 CFR 600-920(a).

4.10 Historic and Cultural Resources

The primary study area on Commencement Bay contains numerous recorded archaeological and historical sites. However, much of the Bay has not been subject to surface or subsurface investigation. As a result, the Programmatic EIS notes that restoration projects could affect prehistoric sites, historic shipwrecks or buildings and Native American traditional cultural properties (USFWS and NOAA, 1996).

Due to the extensively modified nature of both sites and the presence of fill material, particularly at the Wasser/Winter site, encountering of cultural or historic resources is unlikely. Both the Washington Office of Archaeology and Historic Preservation (OAHP) and the Puyallup Tribe of Indians were consulted during preparation of the EA. The OAHP indicated no concerns with construction at either site (Whitlam, personal communication, August 1999). The Puyallup Tribe indicated that a village and fishing weir have been identified in the project area, but their exact location is unknown (Wright, personal communication, August 1999). If any significant cultural materials are exposed or discovered during excavation or subsurface disturbance, operations would cease and a qualified archaeologist contacted for further recommendations. Both OAHP and the Puyallup Tribe would be contacted. Significant cultural resources may include but are not limited to: aboriginal human remains, chipped stone, groundstone, shell and bone artifacts; concentrations of fire cracked rock, ash and charcoal, shell, or bone; and historic features such as building foundations.

4.11 Land and Shoreline Use

Both project sites are located in a heavily developed area dominated by industrial and commercial activities. At the Wasser/Winter site, there is an active log storage yard along the west side of the project site. To the east of the project site is a vacant parking area separated from the project site by a wooden fence. Upstream of the project site, across the SR-509 bridge is a mix of vacant property and a WSDOT mitigation site (described above). The site is owned by the Port of Tacoma, though the Trustees have secured an easement from the Port for restoration purposes.

Consistent with its surrounding land use, the Wasser/Winter site is zoned for industrial uses by the City of Tacoma. According to the City, habitat restoration is a permitted use. The site is also in a shoreline area designated as Urban under the City of Tacoma's shoreline management master program⁵. According to the City's shoreline regulations, "habitat improvement" is a permitted use in the urban shoreline environment.

The Nursery site is within the Puyallup Indian Tribe's conservancy area, and land use activities on the site are under the jurisdiction of the Tribe. Though land immediately around the site is vacant, residential dwellings are located on the bluff overlooking the site. There are industrial uses located across the waterway and to the south. According to the Tribe, habitat restoration is a permitted land use activity on the site.

⁵ TMC Chapter 13.10.

4.12 Noise

Both projects would result in short-term noise impacts from the use of heavy equipment. Noise would be generated by clearing, grubbing, earth moving, dredging, sediment and soil storage and transport, digging, grading, burning, and planting. Trucks, graders, bulldozers and similar equipment can generate noise in the range of 67 to 98 dBA at 50 feet. All construction activities would be conducted in compliance with the City of Tacoma's noise regulations.

No significant noise impacts would occur. Construction would be temporary, and there are no sensitive receptors (e.g. schools, residential areas, and parks) within the immediate vicinity of either site. Both sites are also located in proximity to traffic and industrial activities, which generate substantial amounts of ambient noise.

4.13 Plants

Existing vegetation on upland portions of both sites is characteristic of highly modified habitats, including Scot's broom, Himalayan blackberry, alder, willow and black cottonwood. Bladder wrack (*Fucus*), pickleweed, and *Caryx* were also observed at the Nursery site. Neither project would result in significant impacts to threatened, endangered, or sensitive plants. At the Wasser/Winter site, vegetation in the existing upland area to the east of the creek channel would be removed and replaced with native vegetation characteristic of intertidal areas. At the Nursery site, some vegetation would be removed to re-contour the beach, but the existing stand of large trees on the site would be left. Native intertidal vegetation would be planted on the site. At both sites, intertidal areas (below MHHW) would be planted with sedges, saltgrass, pickleweed, rush, and arrowgrass. Upland vegetation would be enhanced with plantings of red alder, paper birch, black cottonwood, Douglas fir, and a variety of understory species. Impacts could be minimized by saving and replanting native species where possible. There are no known threatened or endangered plant species on or near the project sites.

Refer to Appendix B for a list of species that may be suitable for planting at each site.

4.14 Precedental Effects

Restoration of habitat would be a positive influence on the Bay and its residents and users. The projects would enhance fish and wildlife habitat and benefit the natural resources of the area, as well as enhance the public values by providing public viewing and educational opportunities.

4.15 Public Services and Utilities

There would be limited impacts to public services or utilities during or after construction. Two stormwater outfalls would be intercepted at the Nursery site and the fresh water would be re-directed in the project area to promote vegetative growth. At the Wasser/Winter site, a number of utilities cross Hylebos Creek under the SR-509 bridge (e.g. water, sewer, phone, gas); these utilities would not be disturbed during construction.

The projects are not expected to increase demand for public services and utilities over the long-term. Access to the sites would be limited, and maintenance and monitoring activities are expected to require only limited amounts of water or electricity, if any.

4.16 Recreation

Both proposed projects are located within a developed industrial area; there are no formally developed recreational areas adjacent to either project. The Wasser/Winter site does not presently provide public access, and it is not a recreational area. Although the Nursery site does allow for informal public access, it is not considered a recreational area. As a result, adverse impacts to recreation would be minimal. Once construction is completed, the sites may provide some limited recreational use in a stewardship or educational role.

4.17 Soils and Sediment Quality

Numerous soil samples were collected at the Wasser/Winter site during a previous Remedial Investigation/Feasibility Study conducted by the federal EPA and Ecology. Soils on the Wasser/Winter site include a surface layer of compacted fill, underlain by dredge fill and tidal marsh sediments. Sand was encountered about 18 inches below the surface. Arsenic, the primary contaminant of concern on the site, was found in the highest concentrations at the ground surface; concentrations dropped rapidly with depth. As a result of this sampling effort, the top 2 to 4 feet of earth was removed from the site, removing the bulk of the arsenic contamination. Additional sampling conducted in 1999 did not detect the presence of arsenic at significant concentrations (Ridolfi, 1999). The site is essentially flat, although the banks of the creek channel are steep and eroding in some places.

Soil testing was also conducted at the WSDOT mitigation site upstream of the Wasser/Winter site. Test results were negative for hazardous material contamination except for some limited gasoline constituents associated with an underground storage tank that was reportedly removed (WSDOT, 1994).

On the Nursery site, soils appear to consist of cobble and soft mud below the OHWM. Upland soils appear to be sandy to gravelly. The site is moderately sloped toward the water. While there are no steep slopes on the project site, a steep slope is located just upland of the site, across Marine View Drive.

No significant impacts to soil and sediment quality would occur at either site. Over the short-term, construction would result in a temporary increase in erosion potential, but implementation of erosion control practices would minimize the extent of these impacts. Over the long-term, restoration of a natural soil profile and vegetation community on each site is expected to improve sediment and soil quality.

An area of approximately two acres on the Wasser/Winter site would be graded and/or excavated to restore intertidal habitat conditions. Approximately 17,700 cubic yards (cy) of material would be excavated. If suitable for use, approximately 70 cy would be used on-site for fill, and little to

no import of soils would be required. The project would require a grading permit from the City of Tacoma, and a temporary erosion and sediment control plan (TESCP) would be in place in accordance with the City Erosion Control Manual prior to construction, along with best management practices. These practices may include covering or stabilizing areas of exposed soil, use of silt fences and erosion control mats, and use of sediment curtains or other measures to control sedimentation and turbidity. If contaminated soil is encountered, the soil would be removed and transported offsite to an appropriate disposal facility.

At the Nursery site, approximately 0.66 acres would be graded and/or excavated to restore habitat conditions. Approximately 2,000 cy of excavation would be required. No soil contamination is anticipated, and approximately 230 cy of the excavated soils would be re-used onsite in particular to create a berm between the site and the adjacent Marine View Drive. Appropriate erosion controls would be implemented, similar to the Wasser/Winter site.

4.18 Transportation

The Wasser/Winter and Nursery sites abut Marine View Drive. At the Wasser/Winter site, Marine View Drive is a four-lane arterial road crossing the creek on a bridge, just upstream from the project site. The bridge forms the southeast boundary of the site. Traffic levels are moderate, and include both heavy trucks and cars. There are railroad tracks located across the creek to the northwest and adjacent to Marine View Drive. The nearest intersection to the site is Taylor Way approximately 500 yards to the west. At the Nursery site, Marine View Drive is a two-lane road that is bordered by a steep slope to the east and the project site to the west. Observed traffic levels were light. The 11th Street bridge intersects Marine View Drive several hundred feet to the east of the Nursery site.

No transportation impacts are anticipated. Both projects would add small amounts of construction traffic to local roadways for short periods of time, but impacts would be negligible. Staging areas would be located to minimize disruption of traffic on adjacent roadways. Since public use would be limited after construction is completed, there would be no impacts to transportation over the long term.

4.19 Water Quality

There has been a substantial decline of water quality in Commencement Bay from previous extensive industrial and commercial activity, and from municipal discharges to the Bay. Water quality problems include elevated bacteria levels, higher than normal water temperatures, and elevated levels of chemical pollutants. Arsenic, copper, lead, and PCBs have all exceeded ambient water quality chronic criteria (King County and City of Federal Way, 1990). Several additional contaminants have been identified in outfalls discharging to the Bay. Hylebos Creek runs through the Wasser/Winter site, draining into the Hylebos Waterway and eventually to Commencement Bay and Puget Sound (King County and City of Federal Way, 1990). The Creek provides inputs of both fresh water and sediments to the Bay, and it has been rated as a Class A water body (WAC 173-201A). The Nursery site is located in an area of the Bay designated by Ecology as Class B (WAC 173-201A). Two small streams drain on to the Nursery

sites from culverts under Marine View Drive. During the summer of 1999, the City of Tacoma sampled the water quality in these two streams. During the first two sampling events, there were no consistent contaminant detections (City of Tacoma, 1999). Further sampling is scheduled to occur.

During construction of the intertidal habitat at both sites, there would be minor short-term impacts to water quality resulting from increased turbidity. Overall, impacts are expected to be temporary and localized. Impacts would be greatest at high tide, when the sites experience the greatest inundation. Several measures could be implemented during construction to minimize impacts including:

- Avoidance of work in inundated areas during high tide;
- Use of sediment curtains to contain suspended sediments;
- Use of coffer dams to contain construction area during tidal inundation;
- Avoidance of work during salmonid migration periods; and
- Avoiding releases of gas, oil, and diesel from construction equipment into waters adjacent to the site.

Previously, there have been concerns that construction at the Wasser/Winter site would re-suspend contaminated sediments during in-water work. However, as discussed above, recent soil investigations did not detect any contamination of concern on the site (Ridolfi, 1999). Best Management Practices will be used to minimize the amount of sediment suspension in the water. Construction will only occur during time periods when it will not be detrimental to fish runs.

Over the long-term, both sites would benefit water quality by re-establishing intertidal vegetation communities. These communities would serve to trap sediments and filter water, which would benefit water quality both in Hylebos Creek and in the Bay.

5.0 Project Budget Summary

Factors such as benefits to injured natural resources, diminution of potential environmental impacts, and the probability of success are controlling factors in decisions about these projects. While costs are a factor in restoration implementation, the environmental benefits rather than costs were the determining factors in selecting among design alternatives for these projects. The budgets for the preferred alternatives are being prepared and will be made part of the project records.

6.0 Coordination with Other Programs, Plans and Regulatory Authorities

The Programmatic EIS references a number of area programs that may be potentially applicable to these projects, The project manager will ensure that there is coordination where applicable.

There are a number of potentially relevant laws, regulations and policies that need to be considered during the design and construction of the restoration projects. Several permits and approvals may be required. Among these permits and approvals are:

- U.S. Army Corps of Engineers, Section 404 (Clean Water Act) and Section 10 (River and Harbor Act) permits
- 401 Water Quality Certification, Washington Department of Ecology
- Hydraulic Project Approval, Washington Department of Fish and Wildlife
- Shoreline Substantial Development Permit, City of Tacoma
- Grading Permit, City of Tacoma
- Compliance with Section 7 of the Endangered Species Act
- Compliance with Essential Fish Habitat provisions of the Magnuson-Stevens Fisheries Management Conservation Act.

7.0 List of Agencies Consulted

- U.S. Department of Commerce, National Oceanic and Atmospheric Administration
- National Marine Fisheries Service
- U.S. Fish and Wildlife Service
- U.S. Army Corps of Engineers
- Puyallup Tribe of Indians
- Muckleshoot Indian Tribe

- Washington Department of Ecology
- Washington Department of Natural Resources
- Washington Department of Fish and Wildlife
- Washington Office of Archaeology and Historic Preservation
- City of Tacoma

8.0 References and Personal Communications

These documents have been included in the Administrative Records for these projects. Other documents will be added to the Record as the projects are proceeding through their planning, design, construction, and monitoring phases.

City of Tacoma. 1999. Laboratory Written Report for the Marine View Drive Surface Water Monitoring Sampling and Analysis Plan. City of Tacoma, Public Works Department, Tacoma, WA.

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U.S. Environmental Protection Agency (EPA). 1989. Commencement Bay Nearshore/Tideflats Record of Decision. EPA, Seattle, WA.

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Wright, Judy. Puyallup Tribe of Indians. Personal Communication, telephone conversation with David Wortman, Adolfsen Associates, Inc. August 1999.