

Lower Duwamish River Natural Resource Damage Assessment and Restoration: Vigor Shipyards Habitat Projects, Seattle, King County, Washington

Final Restoration Plan/Environmental Assessment March 2021



(Southwest Yard existing conditions and view south of East Waterway on the Duwamish River. Photo credit: Michael Carlson, FWS)

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Acronyms & Abbreviations

CERCLA – Comprehensive Environmental Response, Compensation, and Liability Act
CWA – Clean Water Act
DNR – Washington Department of Natural Resources
DSAYs – discounted service acre years
EPA – United States Environmental Protection Agency
ESA – Endangered Species Act
HFA – Habitat Focus Area
LDR – Lower Duwamish River
MOA – Memorandum of Agreement
NEPA – National Environmental Policy Act
NOAA – National Oceanic and Atmospheric Administration
NRDAR – Natural Resource Damage Assessment and Restoration
OPA – Oil Pollution Act
PAHs – polycyclic aromatic hydrocarbons
PCBs – polychlorinated biphenyls
RP/EA – Restoration Plan/Environmental Assessment
RP and PEIS – Restoration Plan and Programmatic Environmental Impact Statement
TSSOU – Todd Shipyards Sediment Operable Unit

Executive Summary

Beginning in the early twentieth century, the Lower Duwamish River (“LDR”) has been the site of extensive industrial activities and these activities have resulted in the release of hazardous substances and discharges of oil to the environment. Because of these releases and discharges, natural resources in the LDR have been exposed to and adversely affected by hazardous substances and oil. The physical environment of the LDR has also been altered by dredging, straightening, and shoreline armoring associated with industrial development. Notwithstanding the presence of contamination in the LDR, the LDR remains an important area used by natural resources such as fish, migratory birds, and other wildlife.

Under the Comprehensive Environmental Response, Compensation, and Liability Act, 42 USC §9601, et seq. (“CERCLA”), the Oil Pollution Act of 1990, 33 USC §2701, et seq. (“OPA”) and the Clean Water Act, 33 USC §1251, et seq. (“CWA”), the Trustees for the LDR have been conducting natural resource damage assessment and restoration (“NRDAR”) activities for the LDR. The Trustees for the LDR are the United States Department of the Interior; the National Oceanic and Atmospheric Administration (“NOAA”), on behalf of the United States Department of Commerce; the Muckleshoot Indian Tribe; the Suquamish Tribe; and the State of Washington represented by the Washington State Department of Ecology (State lead Trustee), and the Washington State Department of Fish and Wildlife (collectively, “the Trustees”). For the purposes of this NRDAR, the LDR has been defined by the Trustees to encompass the lower

seven miles of the Duwamish River, from bank to bank; the mouth of the Duwamish River and its confluence with Elliott Bay in the Puget Sound; and the delta area near Harbor Island, i.e., the nearshore areas adjacent to Harbor Island and the East and West Waterways (Section 2.1, Lower Duwamish River Natural Resource Damage Assessment: Injury Assessment Plan).

To implement the NRDAR process, the Trustees work together to determine the extent of injuries to natural resources caused by releases of hazardous substances and discharges of oil in the LDR. The Trustees then seek damages from potentially responsible parties to compensate for the injuries to natural resources and related lost services caused by the releases and discharges. Once the Trustees have recovered damages, the Trustees plan and implement restoration activities to restore, replace, or acquire the equivalent of those resources injured by the hazardous releases and discharges of oil and the services provided by those resources. To guide restoration decisions on specific projects, in 2013, the Trustees issued a “Final Lower Duwamish River NRDA Restoration Plan and Programmatic Environmental Impact Statement” (“Final LDR RP and PEIS”). In the Final LDR RP and PEIS, the Trustees selected Integrated Habitat Restoration as the Preferred Alternative. Under that Preferred Alternative, the Trustees will focus on projects that restore habitat that will benefit a suite of potentially injured resources in the LDR by creating habitat that will provide food, foraging, and resting areas for fish, shorebirds, and other wildlife. The Vigor Shipyards Habitat Projects (“Shipyards Projects”), which have been developed and will be implemented by Vigor Industrial LLC (“Vigor”) and Exxon Mobil Corporation (“Exxon”), are two, related restoration actions that will create habitat that will provide benefits to multiple injured resources.

Here, the Trustees have developed this Final Restoration Plan/Environmental Assessment (“RP/EA”) consistent with applicable legal authorities, e.g., Section 111(i) of CERCLA, to describe to the public and evaluate the type and amount of restoration that will be provided by the Shipyards Projects, including that projects’ environmental impacts. The National Environmental Policy Act, 42 USC §4321, et seq. (“NEPA”), requires federal agencies to identify and evaluate impacts to the environment that may occur due to federal actions. In this Final RP/EA, the federal Trustees analyzed restoration alternatives to identify and evaluate potential environmental impacts resulting from the implementation of those alternatives. This Final RP/EA evaluates a No Action Alternative (Alternative A), an Accept Vigor Shipyards Habitat Projects (Alternative B), an Accept Only the West Waterway Habitat Bench Project (Alternative C), and an Accept Only the Southwest Yard Habitat Project (Alternative D), describes the affected environment, and summarizes the likely impacts of the analyzed restoration alternatives. The Trustees made the Draft RP/EA available to the public for review and comment. The Trustees did not receive any public comments. The Trustees reviewed the Draft RP/EA to create this Final RP/EA and identified the Preferred Alternative, Accept Vigor Shipyards Habitat Projects (Alternative B).

The Vigor Shipyards Habitat Projects are expected to restore, replace or acquire the equivalent of natural resources injured and services lost due to releases of hazardous substances and discharges of oil from Vigor’s Harbor Island facility in the LDR. Exxon will also satisfy its natural resource damages liability for its historic activities at the Vigor facility on Harbor Island with ecological benefits created by the Shipyards Projects. The restoration analyzed by the Trustees in the Final

RP/EA has been proposed by Vigor and Exxon to resolve their liability in a consent decree filed with the United States District Court for the Western District of Washington.

1. Introduction

This Final RP/EA has been prepared by the Trustees for the LDR to identify and analyze an action, the Shipyards Projects, to restore natural resources potentially injured and natural resource services lost due to releases of hazardous substances and discharges of oil into the LDR. The Trustees developed this Final RP/EA to inform the public about the specific restoration activities that the Trustees are evaluating that will likely compensate for the potential injuries to natural resources and related service losses caused by the releases of hazardous substances and discharges of oil into the LDR, including releases and discharges from the Harbor Island facility owned and operated by Vigor and formerly owned and operated by Exxon (“Vigor Harbor Island facility”).¹ Vigor and Exxon have entered into a proposed consent decree with the Trustees, which was lodged concurrently with the public notice and comment period for this Final RP/EA. The proposed consent decree was also subject to a public notice and comment period. In this Final RP/EA, the Trustees are analyzing the restoration actions proposed in the consent decree: the Trustees will accept in settlement the Shipyards Projects, consisting of the West Waterway Habitat Bench Project (“WW Bench Project”) and the Southwest Yard Habitat Project (“SW Yard Project”). Collectively, the restoration actions that make up the Shipyards Projects are projected to generate ecological benefits at least equivalent to 340 discounted service acre years (“DSAYs”).² The estimated ecological benefits to be created by the Shipyards Projects will offset the injuries to natural resources resulting from Vigor and Exxon’s releases of hazardous substances and discharges of oil from the Vigor Harbor Island facility.

Consistent with CERCLA, OPA, CWA, NEPA and related legal authorities, this Final RP/EA:

- Explains the purpose and need for natural resource restoration;
- Summarizes the natural resource injuries and service losses associated with Vigor and Exxon’s activities at the Vigor Harbor Island facility;
- Presents the restoration alternatives evaluated by the Trustees;
- Outlines the Trustees’ restoration goals and restoration screening criteria;
- Evaluates the restoration alternatives under the restoration screening criteria; and
- Analyzes the restoration alternatives’ likely impacts to the environment as well as cumulative effects that may result from implementation of the alternatives.

The Trustees sought public review and comment of the Draft RP/EA during a thirty-day public comment period that began on January 28, 2021. No public comments were received. This

¹ The Vigor Harbor Island facility is located on Harbor Island, adjacent to the West Waterway of the LDR. The Vigor Harbor Island facility consists of Tax Parcels 7666702850, 7666702851, 7666702852, and 7671800254.

² A DSAY is a metric used by the Trustees to measure the total amount of ecological services provided by one acre of habitat over a single year. For more information about the Trustees’ use of DSAYs and measuring natural resource injuries and restoration benefits, see Section 2 of the Final LDR RP and PEIS.

informed the Trustees' review of the Draft RP/EA to create this Final RP/EA, and the Trustees' selection of the Preferred Alternative, Accept Vigor Shipyards Habitat Projects (Alternative B).

1.1 Relationship to Final Lower Duwamish River NRDA Restoration Plan and Programmatic Environmental Impact Statement

This Final RP/EA tiers from the "Final Lower Duwamish River NRDA Restoration Plan and Programmatic Environmental Impact Statement" ("Final LDR RP and PEIS"), which can be accessed here:

<https://casedocuments.darrp.noaa.gov/northwest/lowerduwamishriver/pdf/Final%20Duwamish%20River%20NRDA%20PEIS%20and%20Restoration%20Plan.pdf>.

In 2013, the Trustees issued the Final LDR RP and PEIS to document the Trustees' evaluation of the restoration action alternatives and set forth the Trustees' restoration action selection process and criteria. In the Final LDR RP and PEIS, the Trustees analyzed three restoration alternatives and selected Integrated Habitat Restoration as the Preferred Alternative (See Final LDR RP and PEIS, Section 9.1.3). Under Integrated Habitat Restoration, the Trustees will focus on restoration projects that restore habitat that will benefit a suite of potentially injured resources in the LDR by creating habitat that will provide food, foraging and resting areas for fish, shorebirds, and other wildlife (See Final LDR RP and PEIS, Section 9.1.3). This Final RP/EA tiers (40 CFR 102.20, 40 CFR 1508.28, and 43 CFR 46.140) from and incorporates by reference (40 CFR 1502.21 and 43 CFR 46.135) portions of the Final LDR RP and PEIS for efficiency where appropriate. Under NEPA, tiering is allowed if the future proposed activity is within the range of alternatives and that the nature of the proposed action's environmental impacts is considered in the programmatic document. Here, specific sections of the Final LDR RP and PEIS are cited and summarized to incorporate the Final LDR RP and PEIS by reference in the Final RP/EA. When preparing this Final RP/EA, the Trustees reviewed the Final LDR RP and PEIS in light of current LDR conditions and have found the Final LDR RP and PEIS, and the analysis therein, to be relevant and applicable to the LDR. The activities proposed in this Final RP/EA are consistent with the processes and criteria set forth in the Final LDR RP and PEIS and in line with the Preferred Alternative, Integrated Habitat Restoration Alternative, selected in the Final LDR RP and PEIS.

As explained in the Final LDR RP and PEIS, the Trustees are developing restoration plans, and selecting and implementing restoration projects, prior to completing the damage assessment processes that will identify and quantify injuries and losses to natural resources and associated natural resource services (See Final LDR RP and PEIS, Sections 1.2, 1.3 and 1.6.4). Among other benefits, this has allowed the Trustees to reach early settlements with potentially responsible parties, which in turn provide restoration of injured natural resources much sooner than otherwise would be the case. This Final RP/EA is part of that restoration plan development. However, the Trustees note that the damage assessment process is ongoing, and selection by the Trustees of specific restoration projects in this Final RP/EA (or other restoration projects in subsequent RP/EAs) does not mean that the damage assessment process has been completed. The formal damage assessment process was announced by the Trustees on January 29, 2016 and remains ongoing.

1.2 Purpose and Need for Restoration

The Trustees developed the Final LDR RP and PEIS to evaluate restoration alternatives to restore, replace or acquire the equivalent of those natural resources potentially injured by releases of hazardous substances and discharges of oil in the LDR and compensate for lost resource services (See Section 1.2, Final LDR RP and PEIS). Based on their analysis set forth in the Final LDR RP and PEIS, the Trustees selected Alternative Three, Integrated Habitat Restoration, as the Preferred Alternative to restore potentially injured resources in the LDR.

The purpose of this Final RP/EA is to identify and analyze an action, restoration to settle the Trustees' natural resource damages claims against Exxon and Vigor and benefit natural resources potentially injured and natural resource services lost due to releases of hazardous substances and discharges of oil into the LDR from Exxon and Vigor's activities at the Vigor Harbor Island facility. The Final RP/EA analyzes the restoration offered in the pending consent decree, for the Trustees to accept the Shipyards Projects in settlement, as well as two additional restoration alternatives that accept portions of the Shipyards Projects. Vigor, and, before Vigor, its predecessor, Todd Pacific Shipyards Corp., owns the Vigor Harbor Island facility and operates a shipyard at the Vigor Harbor Island facility for the construction and repair of vessels. Exxon previously owned a portion of the Vigor Harbor Island facility and operated a petroleum storage facility on its portion of the property before selling the property to Todd Pacific Shipyards Corp. Vigor and Exxon's activities at the Vigor Harbor Island facility released hazardous substances and discharged oil that injured natural resources in the LDR. The need for this Final RP/EA is to describe the Shipyards Projects restoration actions proposed in the consent decree between the Trustees, Vigor, and Exxon related to Exxon and Vigor's outstanding natural resource damages liability for the LDR. This Final RP/EA identifies the Trustees' proposed action to restore, replace or acquire the equivalent of those natural resources potentially injured by hazardous releases and discharges of oil associated with Vigor and Exxon's activities at the Vigor Harbor Island facility, including, but not limited to, juvenile chinook salmon, other fish, migratory birds, and the ecological services that they provide.

1.3 Restoration Objectives

Because natural resources that rely on the estuarine and riparian habitat in the LDR are potentially injured by hazardous releases and discharges of oil, the Trustees identified restoration objectives that will restore the estuarine and riparian habitat that supports these resources (See Section 6.5, Final LDR RP and PEIS). To that end, the Trustees identified the following restoration objectives, which informed the development of this Final RP/EA:

1. Implement restoration with a strong nexus to the injuries caused by the releases of hazardous substances in the LDR.
2. 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.
3. Integrate restoration strategies to increase the likelihood of success.

4. Coordinate restoration effort with other planning and regulatory activities to maximize habitat restoration.
5. Involve the public in restoration planning and implementation.

These restoration objectives are consistent with the types of restoration actions that are described under the Preferred Alternative identified in the Final LDR RP and PEIS.

1.4 Natural Resource Trustee Authority

Pursuant to federal law, the Trustees are authorized to act on behalf of the public to assess injuries to natural resources and lost services resulting from releases of hazardous substances and discharges of oil and pursue claims against potentially responsible parties to seek compensation for such losses.³ The goal of the natural resource damage assessment and restoration (“NRDAR”) process is for the Trustees to plan and implement actions that will restore, replace or acquire the equivalent of those natural resources and services that were injured or lost because of releases of hazardous substances or discharges of oil.

The Trustees work together pursuant to a 2006 Memorandum of Agreement (“MOA”) signed by each of the Trustees. The MOA creates the Elliott Bay Trustee Council and formalizes the Trustees’ cooperation and shared efforts to conduct a NRDAR for the LDR and Elliott Bay. Participating Trustees are the United States Department of the Interior; NOAA, on behalf of the United States Department of Commerce; the Muckleshoot Indian Tribe; the Suquamish Tribe; and the State of Washington represented by the Washington State Department of Ecology (State lead Trustee), and the Washington State Department of Fish and Wildlife.

1.5 Summary of Proposed Settlement Agreement

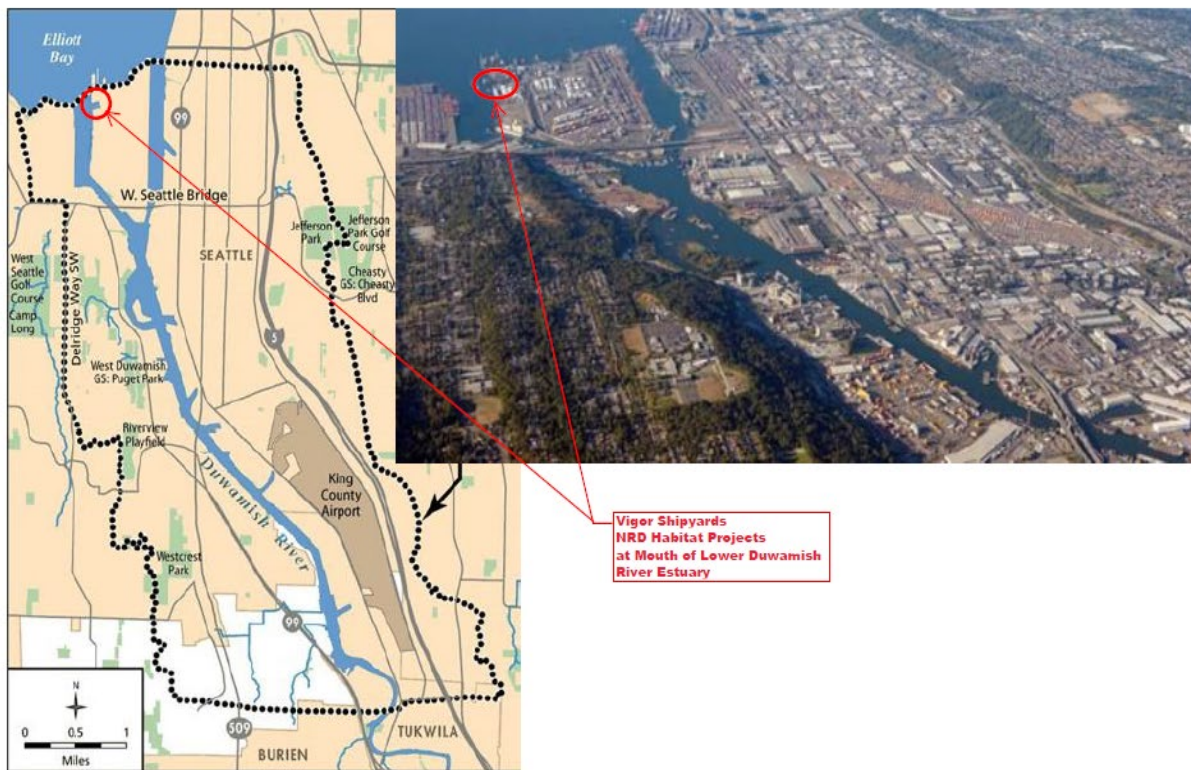
A proposed settlement between the Trustees, Vigor, and Exxon is memorialized in a consent decree that has been lodged with the United States District Court for the Western District of Washington. The consent decree was subject to a thirty-day (30) public notice and comment period, which ran concurrently with the public notice and comment period for the Draft RP/EA. On January 28, 2021, a Notice of Availability for the Consent Decree and the Draft RP/EA was published in the Federal Register.⁴ The proposed consent decree’s terms provide that under the CWA, CERCLA, OPA and the Washington Model Toxics Control Act, Chapter 70.105D RCW, the Trustees will release Exxon and Vigor from natural resource damages liability related to their ownership and operations at the Vigor Harbor Island facility. In exchange, Vigor and Exxon will be responsible for constructing and maintaining the Shipyards Projects, which are made up of two main elements, both located at or adjacent to the Vigor Harbor Island facility. Both elements of the Shipyards Projects are in the Todd Shipyards Sediment Operable Unit (“TSSOU”), which is subject to remediation overseen by the United States Environmental

³ The designation of natural resource trustees is explained in CERCLA, 42 USC § 9607(f), and the National Contingency Plan, 40 CFR subpart G.

⁴ Notice of Lodging of Proposed Consent Decree Under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Clean Water Act (CWA), and the Oil Pollution Act (OPA) and Notice of Availability of Draft Restoration Plan/Environmental Assessment of Restoration Project Incorporated Into Proposed Consent Decree, 86 Fed. Reg. 7,418 (Dep’t of Justice Jan. 28, 2021).

Protection Agency (“EPA”).⁵ The first element is the West Waterway Habitat Bench Project (“WW Bench Project”). In 2006, Vigor completed implementation of the WW Bench Project following the completion of EPA remedial requirements for the TSSOU. The bench is in the West Waterway, slightly south of the confluence of the West Waterway and Elliott Bay, of the western shore of Harbor Island, and provides approximately 0.47 acres of intertidal habitat that is now colonized by marine life and algae. This project was specifically implemented by Vigor, in consultation with the Trustees, for the express purpose of a potential future natural resource damages settlement. The second element, the Southwest Yard Habitat Project (“SW Yard Project”), will remove existing piers and other shipyard structures and create intertidal, marsh and riparian habitat at the Vigor Harbor Island facility along the western shore of Harbor Island. The created habitat will provide approximately 2.67 acres of new, off-channel marsh, intertidal, and riparian habitat adjacent to the West Waterway. Vigor and Exxon’s full implementation of the SW Yard Project is contingent on the court’s entry of the consent decree between the Trustees, Vigor, and Exxon. A copy of the proposed consent decree is available during the public notice and comment period here: <https://www.justice.gov/enrd/consent-decrees>. A Scope of Work attached as an appendix to the consent decree provides more detail regarding the Shipyards Projects.

Figure 1: Projects’ Location



(Figure 1 credit: Floyd | Snider)

⁵ Under CERCLA and state clean up authorities, EPA and state response agencies conduct remedial actions, such as removing, isolating or neutralizing substances, to control the exposure of hazardous substances and oil to the environment in order to protect the environment and public health. For more information about remediation and its relationship to NRDAR, see Section 1.5 of the Final LDR RP and EIS.

1.6 Public Participation

Public participation is an important part of the Trustees' restoration planning process and is also called for under the CERCLA NRDAR regulations (e.g., 43 CFR § 11.81(d)(2)). Under NEPA, federal agencies are also required to comprehensively analyze the impacts of their proposed actions and make information related to their analyses publicly available. The Trustees have and will continue to solicit public participation in the restoration planning and NEPA processes (Section 4.2, Final LDR RP and PEIS).

The Draft RP/EA was posted on the U.S. Fish and Wildlife Service Washington website (www.fws.gov/wafwo/) and the NOAA Damage Assessment, Remediation, and Restoration Program website (<https://darrp.noaa.gov/>) for public review and comment for 30 days beginning with the publication of the Notice of Availability on January 28, 2021. The Trustees also released a newsletter with a link to the webstory on the proposed consent decree and Draft RP/EA to the Lower Duwamish River NRDA Listserv on February 3, 2021. The public was invited to submit comments on the Draft RP/EA in writing or by email:

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The Trustees did not receive any public comments. Because there were no comments from the public, there were no substantive changes made by the Trustees when reviewing the Draft RP/EA to create this Final RP/EA.

The Trustees maintain records related to the LDR NRDAR decision making process. These records are available on the Elliott Bay NRDAR website:
<https://www.diver.orr.noaa.gov/web/guest/diver-admin-record?diverWorkspaceSiteId=5501> .

As the Trustees continue restoration planning, the Trustees may amend this Final RP/EA if significant changes are made to the type, scope or impact of the restoration actions. If there is a significant modification made to this Final RP/EA, the Trustees will provide another public review and comment opportunity related to the modification.

1.7 Organization of the Final RP/EA

The following sections of this Final RP/EA describe the potential injuries to natural resources related to the Vigor Harbor Island facility (Section 2), proposed restoration alternatives (Section 3), as well as the affected environment, potential impacts of the implementation of the alternatives on the human environment, and the potential cumulative impacts of the proposed restoration alternatives (Section 4).

2. Summary of Potential Injury to Natural Resources

Data collected in the LDR indicate that natural resources including fish and migratory birds have been exposed to potentially injurious levels of contaminants in the LDR (AECOM 2012, Johnson, et al., 2009, Windward 2010). Investigations in the LDR have found hazardous substances in sediments, soils and groundwater, including but not limited to arsenic, cadmium, copper, mercury, lead, zinc, phthalates, hexachlorobenzene, polychlorinated biphenyls (“PCBs”), and polycyclic aromatic hydrocarbons (“PAHs”). The Trustees have found over 30 hazardous substances in the LDR sediments (See NOAA, Lower Duwamish Waterway Sediment Characterization Study Report 1998). Nine species of fish that are listed as threatened or candidate species under the Washington State Department of Fish and Wildlife or the Endangered Species Act, 16 USC §1531, et seq. (“ESA”), reside in or migrate through the LDR: Puget Sound Chinook salmon, coho salmon, Puget Sound steelhead, river lamprey, Coastal-Puget Sound bull trout, Pacific herring, Pacific cod, walleye pollock, and rockfish species (Section 2.3.2, Lower Duwamish River Natural Resource Damage Assessment: Injury Assessment Plan). Of the more than eighty bird species found to use and/or that may occur in the LDR, three are listed as threatened under the ESA: Marbled murrelet, Streaked horned lark, and Yellow-billed cuckoo (Section 2.3.2, Lower Duwamish River Natural Resource Damage Assessment: Injury Assessment Plan).

3. Proposed Restoration Alternatives

Pursuant to 43 CFR §11.82(a), the Trustees developed proposed alternatives to restore, replace or acquire the equivalent of those resources and services lost or injured by releases of hazardous substances and discharges of oil from the Vigor Harbor Island facility. The Trustees first developed the Final LDR RP and PEIS and identified three broad restoration alternatives (Section 9, Final LDR PR and PEIS). In the Final LDR RP and PEIS, the Trustees selected Alternative 3, Integrated Habitat Restoration, as the Preferred Alternative. Integrated Habitat Restoration involves restoration actions that will create and enhance habitat to provide food, foraging and resting areas for juvenile salmonids, other fish, birds, and wildlife (Section 9.1.3, Final LDR RP and PEIS). Integrated Habitat Restoration includes restoration actions such as removal of fill to restore mudflats, marsh or riparian habitat; creation of off-channel habitat; altering shorelines to remove hardened banks and create gentler slopes; and removal of over- and in-water structures. The Trustees’ Preferred Alternative (Alternative B) identified in Section 3.3 of this Final RP/EA focuses on habitat creation and enhancement that will benefit a suite of potentially injured species and is consistent with Integrated Habitat Restoration, the Preferred Alternative identified in the Final LDR RP and PEIS.

To identify their Preferred Alternative in this Final RP/EA, the Trustees analyzed proposed restoration alternatives under site-specific and regulatory criteria to determine whether the alternatives provided restoration of a type, quality, and quantity needed to compensate the public for the resources and resource services injured and lost as a result of hazardous releases and discharges of oil from facilities operated by potentially responsible parties in the LDR, including from the Vigor Harbor Island facility. The Trustees also analyzed the potential effects of the

proposed restoration alternatives to the human environment as required under NEPA (40 CFR § 1508.9(b)).

3.1 Restoration Screening Criteria

In order to determine whether the proposed alternatives would sufficiently compensate for the natural resource injuries and service losses caused by contamination in the LDR, the Trustees analyzed each proposed restoration alternative under the Trustees' LDR-specific restoration screening criteria. The Trustees developed two tiers of restoration screening criteria to identify and evaluate potential restoration projects (Section 8.2, Final LDR RP and PEIS). These criteria also reflect and incorporate the Trustees' restoration objectives and the restoration alternative selection factors listed in 43 CFR §§11.82(d)(1) – (10).

Tier 1 Screening Criteria:

Habitat Focus Area: Is the potential restoration located within a high priority Habitat Focus Area (HFA)? The Trustees developed four HFAs based on nexus to resource injuries, important habitat features and other considerations such as geographic boundaries, land and maritime uses, and proximity to other restoration (Section 6.6, Final LDR RP and PEIS). The HFAs were prioritized with the highest priority given to HFA1 (the LDR as defined by the Trustees' Lower Duwamish River Natural Resource Damage Assessment: Injury Assessment Plan) and HFA2 (the inner Elliott Bay shoreline between Duwamish Head and Port of Seattle Terminal 91) because restoration in these areas is more likely to provide benefits to the full suite of injured natural resources.

Benefits to Injured Resources: How similar are the habitats being created or enhanced to the natural resource injuries and lost services that resulted from the contaminant impacts? The Trustees will prioritize restoration that most directly benefits injured resources and services.

Future Management: Would the landowner agree to a conservation easement or other appropriate land management restriction? The Trustees cannot consider restoration without being able to estimate the potential benefits the action will provide, and future land management is critical to the Trustees' ability to estimate these potential benefits.

Tier 2 Selection Criteria:

Technical Feasibility (43 CFR §11.82(d)(1)): Are the management, skill and technology necessary to implement the proposed restoration alternative known and is there a reasonable likelihood of successful completion of the action in a reasonable time period? What are the conditions specific to the proposed alternative that might influence its success?

Cost to Carry Out the Restoration Alternative (43 CFR §11.82(d)(3)): What are the costs associated with implementation of the proposed restoration alternative at the proposed location? The Trustees will take a comprehensive view of costs associated with the proposed alternative and all else being equal, will prefer alternatives that cost less than others.

Source Control and Recontamination Potential (43 CFR §§11.82(d)(4), (5) & (8)): Does the alternative have adequate source control so that the restoration is not likely to be contaminated by releases of hazardous substances? Is there a likelihood that the proposed alternative will result in recontamination of restoration from sediments? The Trustees' preferred alternative should not result in further resource injury or pose a risk to resources or public health.

Extent to Which Each Location Will Maximize Benefits to Resources: When evaluating this selection criteria, the Trustees will determine benefits to injured resources by evaluating specific features of a proposed restoration site, the habitat type to be created, the location of the site, and the site's proximity to other restoration. The Trustees will consider six LDR-specific restoration attributes when evaluating a proposed restoration alternative under this selection criteria and prefer proposed alternatives that incorporate one or more of these attributes (Section 7, Final LDR RP and PEIS):

1. Overall size – The Trustees will prefer larger restoration projects.
2. Shape of the project – The Trustees' preference will depend on the type of habitat being created and its location.
3. Habitat type – The Trustees will prefer proposed alternatives that will create habitats that replace lost or scarce habitat types and/or habitats that are important to support injured resources.
4. Diversity – The Trustees' preference is for alternatives that support a diverse array of species and multiple ecological niches.
5. Location in the LDR – When evaluating this attribute, the Trustees will look at the historic condition of the LDR, resource access and use, societal/cultural factors and potential for contamination.
6. Landscape connectivity – The Trustees will review the proposed restoration's relationship and location relative to existing habitat.

Any proposed restoration alternatives must also be compliant and consistent with all applicable federal, state and tribal policies and laws (43 CFR §§11.82(d)(9) & (10)).

Actions to restore, replace or acquire the equivalent of injured natural resources and lost services are likely to have both long- and short-term impacts to the physical, biological, socio-economic and/or cultural environments. Below the Trustees analyze the potential beneficial and adverse impacts of four alternatives on the human environment. Table 1 provides a comparative analysis of the four restoration alternatives under the two-tiered restoration screening criteria.

3.2 Alternative A: No Action Alternative (Natural Recovery)

As required by NEPA and CERCLA regulations, the Trustees considered a No Action Alternative. A No Action Alternative means that the Trustees would not accept the Shipyards Projects or any other restoration actions proposed by Vigor and Exxon. The Trustees would not take any affirmative action to restore injured resources or require any other party to do so. Instead, the Trustees would rely on natural recovery for injured resources to return to the condition they would otherwise be in but for releases of hazardous substances or discharges of oil. A No Action Alternative will not compensate for interim lost resource services.

Additionally, this alternative assumes the ongoing federal and state activities such as institutional controls, source control, and remedial actions, but does not include actions by the Trustees or any other party specifically targeting injured resource restoration such as habitat creation.

Under a No Action Alternative, Vigor would not implement the Shipyards Projects and the Trustees would not accept the projects and their benefits as compensation to settle Vigor and Exxon's natural resource damages liability related to the Vigor Harbor Island facility. In this scenario, the WW Bench Project would not be subject to monitoring and maintenance by Vigor to ensure that it will provide habitat to benefit fish and other aquatic resources injured by hazardous releases and oil discharges. Additionally, Vigor would not implement the SW Yard Project and the additional 2.67 acres of off-channel marsh, intertidal, and riparian habitat would not be created. Currently, there is very little off-channel habitat for salmonids existing along the West Waterway. The West Waterway is an important migration corridor and final refuge for juvenile salmonids and other fish as they adjust to the higher salinity in the Puget Sound before entering Elliott Bay. Without additional habitat creation, habitat supporting injured fish, migratory birds, and wildlife in the LDR will remain degraded and scarce. Under this alternative, additional riparian and upland habitat would not be available to migratory birds and wildlife for foraging, nesting and refuge. The LDR ecosystem processes will continue to remain impaired for a longer period because processes such as water filtration and nutrient input will not be enhanced by habitat restoration.

3.3 Alternative B: Accept Vigor Shipyards Habitat Projects (Preferred)

Alternative B involves the Trustees accepting the Shipyards Projects in settlement from Vigor and Exxon to compensate for injuries caused by Exxon and Vigor's activities at the Vigor Harbor Island facility. Under Alternative B, the Trustees will accept both elements of the Shipyards Projects: the WW Bench Project and the SW Yard Project. The Shipyards Projects are anticipated to result in the removal of 5,770 creosote-treated pilings and 2.74 acres of overwater coverage. In total, the Vigor Shipyards Habitat Projects are expected to create approximately 3.14 acres of riparian, marsh, and intertidal habitat on or adjacent to the West Waterway.

Vigor completed the implementation of the WW Bench Project in 2006. The WW Bench Project was constructed following the completion of remedial activities in the TSSOU per EPA requirements. The WW Bench Project was constructed by Vigor voluntarily as a potential restoration project to resolve natural resource damages liability and was not a requirement of the remedial action. Vigor permanently removed overwater structures and creosote-treated pilings in the footprint of the WW Bench Project and created approximately 0.47 acres of intertidal habitat on top of a sand cap. The WW Bench Project has been colonized by marine algae and, as intended, is used by small fish.

The SW Yard Project is not yet constructed, but once implemented, will provide approximately 2.67 acres of new, off-channel marsh, intertidal, and riparian habitat. To construct the SW Yard Project, Vigor will first remove existing shipyard structures, i.e., Piers 1, 1A, and 2P, and Ship Building Ways, and conduct final sediment clean-up as required by its 2003 consent decree with

Figure 2: Southwest Yard Habitat Project Rendering



the EPA.⁶ Stormwater infrastructure will be re-routed to avoid impacts to the habitat. Any stormwater outfalls that may remain in the vicinity of the project will have to meet water quality standards mandated by law and any additional requirements set by the Trustees. Vigor and Exxon will then implement new habitat in the footprint and vicinity of the removed shipyard structures, across from Pier 3, prioritizing creation of intertidal, marsh and riparian habitats. Salmon will be able to access the habitat from the West Waterway through a channel opening in the northeast of the newly created habitat. A protective berm will be constructed between the habitat and the basin between the habitat and Pier 3. Vigor's shipyard vessel activity in the basin's open water in the vicinity of the SW Yard Project will be restricted, with an emphasis on limiting activity from March 1 through June 30 of each year, to avoid impacts to migrating salmon. Vigor and Exxon will also implement a migration corridor, consisting of a habitat bench, in the basin outside the protective berm for fish to more easily access the habitat. Vegetation and substrates appropriate to the relevant habitat type will be selected and implemented by Vigor and Exxon with the Trustees' input and approval. Final design documents will be submitted to the Trustees for review and approval before construction begins.

For Alternative B, the proposed consent decree stipulates that the Shipyards Projects shall be permanently protected under environmental covenants. Uses that conflict with the conservation values created by the Shipyards Projects will be restricted. Per the terms of the proposed consent decree, and its attachments, Vigor and Exxon must also monitor and maintain the Shipyards Projects for a 30-year period following completion of the SW Yard Project. Additionally, and after the 30-year monitoring and maintenance is completed, Vigor and Exxon will develop a long-term stewardship plan to maintain the Shipyards Projects into perpetuity. Together, permanent property protection and on-going monitoring and maintenance will preserve the habitat created by the Shipyards Projects so that the habitat will continue to benefit natural resources injured by releases of hazardous substances and discharges of oil from Vigor and Exxon's activities at the Vigor Harbor Island facility.

3.4 Alternative C: Accept Only the West Waterway Habitat Bench Project

This alternative consists of the Trustees accepting only the WW Bench Project in settlement from Vigor and Exxon. This alternative does not include the Trustees accepting or requiring any other restoration actions other than the WW Bench Project and excludes the Trustees accepting the SW Yard Project. Since it was completed in 2006, the WW Bench Project has provided approximately 0.47 acres of intertidal habitat on top of a sand cap. The WW Bench Project has been fully implemented since 2006. Vigor constructed the WW Bench Project, voluntarily as a potential restoration project to address natural resource damages liability, following the completion of remedial activities in the TSSOU per EPA requirements. As part of implementing the WW Bench Project, Vigor permanently removed overwater structures and creosote-treated pilings in the footprint of the WW Bench Project. The WW Bench Project has been colonized by marine algae and, as intended, is used by small fish.

Under this alternative, the WW Bench Project would be permanently protected by environmental covenants that would restrict the uses of the property to only those consistent with habitat

⁶ For more details regarding Vigor's remedial obligations, see *United States v. Todd Pacific Shipyards Corp.*, Civil No. CV03-1179 (W.D. Wash., May 22, 2003).

creation and conservation. Vigor and Exxon would be required to monitor and maintain the WW Bench Project for the initial 30 years after the entry of the consent decree to guarantee that the WW Bench Project habitat will continue to function to support natural resources injured by hazardous releases and discharges of oil. After the initial 30 years, the Trustees would require Exxon and Vigor to implement a long-term stewardship plan. Implementation of the permanent protection and monitoring and maintenance requirements for the WW Bench Project is contingent on the Court entering the consent decree between the Trustees, Exxon, and Vigor.



(View of West Waterway Habitat Bench Project, looking south. Photo credit: Floyd |Snider)

3.5 Alternative D: Accept Only the Southwest Yard Habitat Project

Under this alternative, the Trustees would accept the SW Yard Project from Exxon and Vigor to offset injuries to natural resources caused by Exxon and Vigor's releases of hazardous substances and discharges of oil from the Vigor Harbor Island facility. This alternative does not include the Trustees accepting or requiring any other restoration actions. Implementation of the SW Yard Project is contingent on the Court entering the consent decree between the Trustees, Exxon and Vigor. Once implemented, the SW Yard Project will create approximately 2.67 acres of new, off-channel marsh, intertidal, and riparian habitat. As described in more detail in Section 3.3 of this Final RP/EA, Vigor and Exxon will first remove existing shipyard structures and conduct final sediment clean-up as set forth in Vigor's 2003 consent decree with the EPA. Vigor and Exxon will then implement new intertidal, marsh, and riparian habitat in the footprint and vicinity of the removed shipyard structures. A channel opening in the northeast of the site will provide fish access to the habitat from the West Waterway. Vigor and Exxon will construct a

protective berm between the habitat and the basin. To avoid impacts to fish, Vigor's shipyard vessel activity in the basin's open water in the vicinity of the SW Yard Project will be restricted. Vigor and Exxon will work with the Trustees to select and implement vegetation and substrates appropriate to the relevant habitat type. Final design documents will be submitted to the Trustees for review and approval before construction begins. This alternative would require Vigor and Exxon to place environmental covenants on the project property to restrict uses to only those consistent with the desired habitat functions to benefit injured natural resources. The Trustees would also require Vigor and Exxon to monitor and maintain habitat values at the project site for 30 years, followed by implementation of a long-term stewardship plan.

3.6 Evaluation of Alternatives Using Restoration Criteria

An evaluation of restoration alternatives is presented in the following "Table 1. Evaluation of Alternatives."

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**Table 1:
Evaluation of
Alternatives**

Restoration Criteria	Alternative A: No Action	Alternative B: Accept Vigor Shipyards Habitat Projects (Preferred)	Alternative C: Accept Only West Waterway Habitat Bench Project	Alternative D: Accept Only Southwest Yard Habitat Project
Tier 1:				
Habitat Focus Area (“HFA”)	The No Action Alternative would not restore, replace, or acquire the equivalent of natural resources and services injured due to releases of hazardous substances and discharges of oil in the Trustees’ defined HFAs.	This alternative would restore habitat in the Trustees’ highest priority HFA, HFA1, that supports resources injured by releases of hazardous substances and discharges of oil.	This alternative would restore habitat in the Trustees’ highest priority HFA, HFA1, that supports resources injured by releases of hazardous substances and discharges of oil.	This alternative would restore habitat in the Trustees’ highest priority HFA, HFA1, that supports resources injured by releases of hazardous substances and discharges of oil.
Benefits to Injured Resources	The No Action Alternative would not restore, replace, or acquire the equivalent of natural resources and services injured or lost from releases of hazardous substances and discharges of oil.	This alternative will likely restore habitat that provides benefits to a suite of resources injured by releases of hazardous substances and discharges of oil.	This alternative will likely restore intertidal habitat that will primarily benefit aquatic resources, such as salmon and other fish, injured by hazardous releases and oil discharges. Under this alternative, other injured resources, such as birds, will realize fewer direct benefits than under Alternatives B and D.	This alternative will likely restore habitat that provides benefits to a suite of resources injured by releases of hazardous substances and discharges of oil.
Future Management (Duration of Benefits)	The No Action Alternative would not restore, replace or acquire the equivalent of injured	Under this alternative, the duration of the benefits will be long-term. Vigor and Exxon will be	The duration of benefits under this alternative will be long-term. Under the consent decree, Vigor and	Under this alternative, the duration of the benefits will be long-term. Vigor and Exxon will be

	resources and services caused by hazardous releases or oil discharges and would provide no potential benefits for the Trustees to estimate or seek to protect.	required to obtain covenants to permanently restrict the uses of the land for restoration and habitat conservation. The permanent property restrictions will be paired with required long-term stewardship to ensure that the alternative will be more likely to continue to provide injured resources with benefits into the future.	Exxon will be required to obtain covenants from landowners to permanently protect the project for restoration and habitat conservation. Vigor and Exxon will be required to provide long-term stewardship to ensure that the alternative will be more likely to provide injured resources with benefits into the future.	required to permanently restrict the uses of the land for restoration and habitat conservation. The permanent property restriction will be paired with required long-term stewardship to ensure that the alternative will be more likely to continue to provide injured resources with benefits into the future.
Tier 2:				
Technical Feasibility	The No Action Alternative is technically feasible.	Activities included in this alternative are technically feasible and likely to result in the restoration of the suite of resources injured or similar to those injured by releases of hazardous substances and discharges of oil.	Activities included in this alternative are technically feasible and likely to result in the restoration of some of the resources injured or similar to those injured by releases of hazardous substances and discharges of oil.	Activities included in this alternative are technically feasible and likely to result in the restoration of the suite of resources injured or similar to those injured by releases of hazardous substances and discharges of oil.
Cost to Carry Out the Alternative	The No Action Alternative would not restore, replace or acquire the equivalent of those resources and services injured or lost due to releases of hazardous substances and discharges of oil; therefore, the No	The costs to carry out this alternative are estimated to total approximately \$47,600,000 which would create and enhance habitat that is likely to support resources injured by hazardous releases and discharges of oil.	The costs to carry out this alternative are estimated to be less than \$47,600,000 because this project is one of two components under Alternative B to create and enhance habitat that is likely to benefit resources	The costs to carry out this alternative are estimated to be less than \$47,600,000 because this project is only one of two components under Alternative B to create and enhance habitat that is likely to benefit resources

	Action Alternative would not incur any costs.		injured by hazardous releases and oil discharges.	injured by hazardous releases and oil discharges.
Source Control and Recontamination Potential	The No Action Alternative will not cause further resource injury or pose additional risks to human health and the environment. Environmental and human health risks as they currently exist would likely remain the same under the No Action Alternative.	This alternative would not elevate existing public health and safety issues.	This alternative would not elevate existing public health and safety issues.	This alternative would not elevate existing public health and safety issues.
Extent to Which Location Will Maximize Benefits to Resources	The No Action Alternative would not restore, replace, or acquire the equivalent of natural resources and services injured due to releases of hazardous substances and discharges of oil and would not produce resource benefits.	This alternative would be in HFA1 and create or enhance approximately 3.14 acres of scarce off-channel marsh, intertidal, and riparian habitat that support the suite of resources injured by releases of hazardous substances and discharges of oil. This alternative is likely to meet the Trustees' restoration criteria.	This alternative would be in HFA1 and would create or enhance approximately 0.47 acres of intertidal habitat that will primarily benefit injured aquatic resources rather than the range of resources injured by hazardous releases and oil discharges. This alternative is likely to meet some of the Trustees' restoration criteria.	This alternative would be in HFA1 and will create approximately 2.67 acres of new, off-channel marsh, intertidal, and riparian habitat that will benefit the suite of resources injured by releases of hazardous substances and discharges of oil. This alternative is likely to meet some of the Trustees' restoration criteria.
Compliance with Laws and Policies	The No Action Alternative would not comply with or be consistent with relevant	This alternative meets the requirements and goals of CERCLA, OPA, and the CWA to compensate the	This alternative does not meet the goals and requirements of CERCLA, OPA, and the	This alternative does not meet the goals and requirements of CERCLA, OPA, and the

	laws and policies because it does not restore, replace, or acquire the equivalent of the resources and services injured by releases of hazardous substances and discharges of oil as required by CERCLA, OPA, and the CWA natural resource damage assessment authorities.	public by restoring, replacing or acquiring the equivalent of resources injured by releases of hazardous substances and discharges of oil. The Trustees will comply with all applicable requirements.	CWA because it does not sufficiently compensate the public by restoring, replacing or acquiring the equivalent of those resources injured by releases of hazardous substances and discharges of oil. The amount of resource benefits likely to be produced by this alternative do not offset the resource injuries caused by Vigor and Exxon's releases and discharges.	CWA because it does not sufficiently compensate the public by restoring, replacing or acquiring the equivalent of those resources injured by releases of hazardous substances and discharges of oil. The amount of resource benefits likely to be produced by this alternative do not offset the resource injuries caused by Vigor and Exxon's releases and discharges.
Time to Provide Resource Benefits	Under the No Action Alternative, it will take longer to provide natural resource benefits than if the Trustees were to pursue Alternative B. The No Action Alternative would rely on natural recovery to provide benefits to injured natural resources.	The time for this alternative to provide natural resource benefits is less than the No Action Alternative because this alternative includes affirmative habitat creation and enhancement, which will likely start benefiting resources injured by hazardous releases and discharges of oil in a relatively short timeframe.	The time for this alternative to provide natural resource benefits is less than the No Action, B, and D Alternatives because this alternative is already implemented and currently providing benefits primarily to aquatic resources injured by hazardous releases and oil discharges.	The time for this alternative to provide natural resource benefits is less than the No Action Alternative because this alternative includes affirmative habitat creation and enhancement, which will likely start benefiting resources injured by hazardous releases and discharges of oil in a relatively short timeframe.

4. Environmental Assessment

Consistent with the CERCLA NRDAR regulations, e.g., 43 CFR §11.93, in this section of the Final RP/EA, the Trustees document their evaluation of the restoration alternatives to compensate the public for natural resource injuries caused by the release of hazardous substances and discharges of oil from the Vigor Harbor Island facility. The Trustees also evaluate the environmental impacts of the No Action Alternative, Alternative B (the Preferred Alternative), Alternative C, and Alternative D to determine whether the implementation of these alternatives will significantly affect the human environment. To evaluate the alternatives' potential impacts to the human environment, the Trustees focus on the physical, biological, socio-economic, and cultural environments. Following the conclusion of their evaluation for each alternative and the public comment period, the Trustees determined that Alternative B, Accept Vigor Shipyards Habitat Projects, is the Preferred Alternative. Alternative B, Accept Vigor Shipyards Habitat Projects, will be implemented if a Finding of No Significant Impact is reached.

The United States Department of the Interior is acting as the lead federal agency for NEPA compliance for this Final RP/EA and NOAA is a cooperating agency. NOAA has made the determination that it is appropriate to adopt the Final EA in accordance with 40 CFR §1506.3 and its agency-specific NEPA procedures.

The following definitions will be used to describe the environmental consequences evaluated in this Final RP/EA:

- *Short-term or long-term impacts:* These characteristics are determined on a case-by-case basis and do not refer to any rigid time period. Short-term impacts are those impacts that would occur only with respect to a specific activity or a finite period. Long-term impacts are those that would more likely persist or be chronic.
- *Direct or indirect impacts:* A direct impact is caused by a proposed action and occurs contemporaneously at or near the location of the action. An indirect impact is caused by a proposed action and might occur at a later time or be farther removed in distance but still be a reasonably foreseeable outcome of the action.
- *Negligible, minor, moderate or major impacts:* These relative terms are used to characterize the magnitude of an impact. Negligible impacts are generally not quantifiable and do not have perceptible impacts on the environment. Minor impacts are generally those that might be perceptible but, in their context, are not amenable to measurement because of their relatively inconsequential effect. Moderate impacts are those that are more perceptible and, typically, more amenable to quantification. Major impacts are those that, in their context and due to their intensity (severity), have the potential to meet thresholds for the significance set forth in Council on Environmental Quality NEPA regulations (40 CFR §1508.27) and thus warrant heightened attention and examination for potential means for mitigation to fulfill NEPA requirements.
- *Adverse or beneficial impacts:* An adverse impact is one having adverse, unfavorable, or undesirable outcomes on the man-made or natural environment. A beneficial impact is one having positive outcomes on the man-made or natural environment. A single act

might result in adverse impacts on one environmental resource and beneficial impacts on another resource.

- *Cumulative impacts*: Cumulative impacts are defined as “the impacts on the environment which result from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR §1508.7). Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time within a geographic area.

4.1 Affected Environment

For purposes of this Final RP/EA, the Trustees focused on the lower seven miles of the Lower Duwamish River, located in King County, Washington. The affected environment in the LDR is described in detail in Chapter 3 of the Final LDR RP and PEIS. That information is incorporated in this Final RP/EA by reference and summarized briefly below.

4.1.1 Physical and Biological Setting

Historically, the LDR was forestland, intertidal flats, and freshwater and estuarine wetlands. Beginning with industrialization in the early twentieth century, the LDR became increasingly altered and is now mainly industrial and residential development. The LDR is restricted along both banks by levees or rock revetments and is periodically dredged between its mouth and river mile 5.5. Approximately 99 percent of the former estuarine wetlands and mudflats have been either dredged or filled for industrial purposes (U.S. Department of the Interior, Fish and Wildlife Service, 2000; U.S. Army Corps of Engineers, 2000).



(Vigor shipways to be demolished for Southwest Yard Habitat Project. Photo credit: Floyd | Snider)

The project location for the Preferred Alternative (Alternative B) is on and along the eastern shore of the West Waterway directly before the confluence of the West Waterway of the Lower Duwamish River with Elliott Bay in Seattle, King County, Washington. Alternatives C and D are subparts of the Preferred Alternative; therefore, the physical and biological setting for the Preferred Alternative is inclusive of Alternatives C and D. The Preferred Alternative will be located on Harbor Island, which is a CERCLA Superfund Site, and in the TSSOU sediment remedial action area. The upland Harbor Island property is currently owned by Vigor. A portion of in-water habitat that will be part of the Preferred Alternative is owned by the Washington Department of Natural Resources (“DNR”). The Preferred Alternative is in an industrialized area that has been used as a shipyard since at least 1967 and was also the site of a petroleum storage facility from about 1906 to 1967. Shipyard infrastructure located at the Preferred Alternative includes overwater structures such as piers, dry docks, creosote-treated pilings, and stormwater outfalls. The Preferred Alternative location currently has armored shorelines. Prior to the creation of the WW Bench Project, Vigor met EPA requirements for sediment clean up in the project’s physical footprint consistent with the 2003 settlement between EPA and Vigor. In 2007, EPA approved an Operations, Monitoring, and Maintenance Plan for the TSSOU sediment remediation, which required ongoing monitoring of the WW Bench Project and, in 2016, the cap was found to be stable and no further monitoring was required.

The Preferred Alternative will restore and maintain 3.14 acres of riparian, marsh, and intertidal habitat on or adjacent to the West Waterway. Located close to the confluence of the West Waterway with Elliott Bay and on or adjacent to the heavily industrialized Harbor Island, the Preferred Alternative will create habitat to benefit injured natural resources in a location within the LDR where existing habitat is scarce. Habitat to be created under the Preferred Alternative will reflect the historic habitat types and conditions found in the LDR. The WW Bench Project element of the Preferred Alternative provides shallow intertidal habitat that is important for juvenile salmonids and other fish for forage and rest as they complete their migration to the Puget Sound. The SW Yard Project element of the Preferred Alternative will provide off-channel rearing habitat for fish as well as riparian habitat for nesting birds. Additionally, habitat created under the Preferred Alternative will provide food sources benefitting the suite of natural resources injured by releases of hazardous substances and oil discharges from the Vigor Harbor Island facility. Habitat enhancements or creation that will be part of the Preferred Alternative include, but are not limited to:

- Creation of approximately 0.35 acres of off-channel marsh habitat;
- Creation of approximately 2.5 acres of intertidal habitat;
- Removal of approximately 2.74 acres of overwater coverage;
- Removal of approximately 5,770 creosote-treated wood pilings; and
- Creation of approximately 0.29 acres of riparian buffer.⁷

⁷Because the LDR is a dynamic natural system, the Trustees anticipate that the exact acreages of each habitat type may slightly shift over time.

The Preferred Alternative will be subject to initial monitoring and adaptive management for a 10-year performance period followed by a 20-year period for actions to preserve, maintain and protect the projects so that they can continue to provide ecological benefits to resources injured by hazardous releases and oil discharges. In the project scope of work, attached as an appendix to the consent decree, a plan is also required to provide for long-term stewardship following the first 30 years so that the Preferred Alternative projects continue to function as intended. The property where the Preferred Alternative projects are located will also be subject to environmental covenants. These covenants will restrict the use of the underlying property to ensure that the Preferred Alternative's habitat and functions are permanently protected and continue to compensate for injured natural resources and related lost ecological services into the future.

Federally listed threatened species under the ESA known to be or that may occur in the vicinity of the Preferred Alternative projects include Marbled murrelet, Yellow-billed cuckoo, Coastal-Puget Sound bull trout, Puget Sound Chinook salmon, and Puget Sound steelhead (U.S. Army Corps of Engineers, 2000; NOAA 2007). The Lower Duwamish River, where the Preferred Alternative projects are located, is essential fish habitat for Chinook and Steelhead (NOAA, 2014; NOAA 2016). Federal species of concern under the ESA known to be or that may occur in the vicinity of the Preferred Alternative project include the bald eagle (FWS 2007).

4.1.2 Demographics and Economy

A summary of demographic data for the area in the vicinity of the Preferred Alternative and Alternatives C and D is provided in Table 2. Because Alternatives C and D are subsets of the Preferred Alternative and located within the Preferred Alternative's physical footprint, the following analysis of demographic and economic impacts of the Preferred Alternative also applies to Alternatives C and D. The City of Seattle ("City") is the eighteenth most populous city in the United States and, from 2000 to 2010, its population grew 8% (<http://www.seattle.gov/opcd/population-and-demographics/about-seattle>). The City's Office of Planning and Community Development projects that the City will add 120,000 people and 115,000 jobs between 2015 and 2035 (City of Seattle, 2017).

According to the United States Census Bureau, as of 2019, the estimated total percentage of Washington residents living in poverty is 10.3% (<https://www.census.gov/quickfacts/WA>). The total estimated averaged percentage of Washington residents who are minorities is 20.9% (<https://www.ofm.wa.gov/washington-data-research/statewide-data/washington-trends/population-changes/population-race>).

Table 2: Demographic Data

Demographic Category	City of Seattle ⁸	King County ⁹
Population (2018 estimate)	730,400	2,190,200
Percent Minority	33.7%	35.2%
Median Annual Household Income	\$83,476	\$78,800
Estimated Percentage of Persons Below Poverty Level	11.5%	10.7%
Households	341,809	789,200
Population per square mile	8,800	1,027

4.1.3 Environmental Justice

Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires each federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. In a memorandum accompanying Executive Order 12898, the President emphasized the importance of the NEPA process to identify and address environmental justice concerns and stated that federal agencies shall provide opportunities for community input in the NEPA process.

Focusing on environmental justice issues associated with implementing the Preferred Alternative and Alternatives C and D, the Trustees reviewed demographic data from the City of Seattle, King County, the State of Washington, and the United States Census Bureau. For purposes of the environmental analysis in this Final RP/EA, a city or county is considered to have a minority population if its non-white population is greater than 50 percent or if it is meaningfully larger than the statewide non-white population. In this analysis, low-income areas are defined as a city or county in which the percentage of the population below poverty exceeds 50 percent or is meaningfully greater than the statewide average poverty level.

To make a finding that disproportionately high and adverse effects would likely impact minority and/or low-income populations, three conditions must be simultaneously met:

1. There must be a minority or low-income population in the impact zone.
2. A high and adverse impact must exist.
3. The impact must be disproportionately high and adverse on the minority or low-income population.

⁸ Statistics for the City demographic data are from the City of Seattle’s Office of Planning and Community Development, which collects data from a variety of sources including the Washington State Office of Financial Management and the United States Census Bureau (<http://www.seattle.gov/opcd/population-and-demographics/about-seattle>), and the EPA’s Environmental Justice Screening and Mapping Tool (Version 2019) (<https://ejscreen.epa.gov/mapper/>).

⁹ Statistics for King County demographic data are from the King County Office of the Executive, which collects data from a variety of sources including the Washington State Office of Financial Management and the United States Census Bureau (<https://www.kingcounty.gov/depts/executive/performance-strategy-budget/regional-planning/Demographics.aspx>).

A comparison of King County and City of Seattle demographic data to statewide demographic data for Washington, indicates that the Preferred Alternative projects area, as well as the project areas for Alternatives C and D, is not considered low-income because the low-income population in the project area (10.7-11.5%) is not meaningfully greater than the statewide low-income average poverty level (10.3%). The Preferred Alternative projects area and the Alternatives C and D project areas do not have a minority population exceeding 50 percent; however, the percentage minority population in the project area (33.7- 35.2%) is relatively greater than the statewide non-white population (20.9%). The Trustees did not identify any high and adverse impacts that would result from the Preferred Alternative or Alternatives C and D. Accordingly, the Trustees did not find that low-income or minority populations would face disproportionately high and adverse effects associated with the Preferred Alternative or Alternatives C and D.

4.1.4 Recreation

The LDR is used for recreational purposes. Recreational fishing occurs in the LDR; however, there are fish consumption advisories for resident fish and shellfish (Washington State Department of Health, 2005). Other recreational activities include boating, kayaking, beach recreation, picnicking, and walking along the shoreline (Windward, 2010). There are also several public parks along the river (e.g., Terminal 18 Park, Terminal 105 Park, Herring House Park, Terminal 107 Park, and Duwamish Waterway Park), multiple public access points, and the Duwamish Trail used for walking, running, and biking. Over- and in-water structures in the vicinity of the Preferred Alternative projects area are typically industrial in nature and not used for recreational activities or access.

4.1.5 Cultural and Historic Resources

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of the Preferred Alternative on historic properties. Under NEPA, federal agencies must also consider historic properties. The proposed consent decree requires Vigor and Exxon to undertake activities to address cultural resource issues at the Preferred Alternative projects sites, including consulting with the Washington State Department of Archeology and Historic Preservation and federally recognized tribes. Per the 1855 Treaty of Point Elliott, the Suquamish Tribe and the Muckleshoot Indian Tribe have reserved fishing, hunting and gathering rights. Additionally, the Muckleshoot Indian Tribe and the Suquamish Tribe have adjudicated usual and accustomed fishing areas located in the LDR. There are no known historic resources within the Preferred Alternative. Vigor will coordinate with the Muckleshoot Indian Tribe regarding net attachments at the SW Yard Project site for Tribal members' use.

4.1.6 Components Not Affected or Not Analyzed in this Final RP/EA

The following components have been identified as not being present, affected, or analyzed. These components have not been included for additional analysis in this Final RP/EA.

- Social/Economic/Environmental Justice – The Trustees do not anticipate social or economic impacts from the proposed restoration action because low-income populations will not be adversely affected and the Preferred Alternative and Alternatives C and D are likely to have beneficial environmental outcomes and will likely have no impact on recreation.
- Cultural and Historic Resource Concerns – As appropriate, the Trustees will ensure coordination with the Muckleshoot Indian Tribe, the Suquamish Tribe and the Washington State Department of Archeology and Historic Preservation in accordance with Section 106 of the National Historic Preservation Act.
- Health and Safety – No health or safety issues are likely related to the Preferred Alternative or Alternatives C and D. Consistent with the terms of the 2003 consent decree between Vigor and EPA, Vigor has completed remedial clean up and monitoring requirements for the WW Bench Project. For the SW Yard Project implementation, once it removes piers and other shipyard infrastructure, Vigor will fulfill its obligation under its 2003 consent decree with EPA for the TSSOU to perform final remediation of all contaminated sediments below removed overwater structures. Vigor will conduct soil sampling per a Trustees and EPA approved plan to determine whether any additional soil remediation will be required before the SW Yard Project is constructed. Vigor will also sample all constructed habitat surfaces and imported material to verify that soil and other materials meet the Sediment Quality Standards set forth in the Washington Sediment Management Standards.

4.2 Evaluation of Alternative A: No Action Alternative/Natural Recovery

The No Action Alternative is set forth in Section 9.1.1 of the Final LDR RP and PEIS. The Final LDR RP and PEIS contains an evaluation of potential environmental impacts of the No Action Alternative in Section 9.2 of the Final RP and PEIS. Additionally, the No Action Alternative’s potential environmental impacts are summarized in Table 3 in the Final LDR RP and PEIS. This information in the Final LDR RP and PEIS is incorporated in this Final RP/EA by reference.

4.2.1 Alternative A Conclusion

The Trustees have determined that the No Action Alternative would not restore, replace, or acquire the equivalent of natural resources injured by releases of hazardous substances or discharges of oil from the Vigor Harbor Island facility. Accordingly, the No Action Alternative does not meet the purpose or need for restoration identified in this Final RP/EA or as required under CERCLA, OPA, and other legal authorities that govern the Trustees’ NRDAR process and responsibilities.

4.3 Evaluation of Alternative B: Accept the Vigor Shipyards Habitat Projects (Preferred)

The Trustees evaluated the likely environmental impacts of the Preferred Alternative (Accept the Vigor Shipyards Habitat Projects), Alternative C (Accept Only the West Waterway Habitat Bench Project) and Alternative D (Accept Only the Southwest Yard Habitat Project) at the programmatic level in Section 9 of the Final LDR RP and PEIS. This information in the Final

LDR RP and PEIS is incorporated in this Final RP/EA by reference. As contemplated in the Final LDR RP and PEIS, the following section of this Final RP/EA tiers from the Final LDR RP and PEIS to analyze likely environmental impacts specific to the Preferred Alternative and Alternatives C and D.

4.3.1 Alternative B Environmental Impacts

It is likely that implementation of the Preferred Alternative will result in long-term direct and indirect moderate benefits that will outweigh any short-term or long-term minor adverse impacts. The Preferred Alternative will create, permanently protect, and maintain 3.14 acres of riparian, marsh and intertidal habitat adjacent to and in the West Waterway. Located in and adjacent to a migration corridor, this habitat will provide a refuge for fish and birds, provide a place for rearing, and serve as a food source. Under the Preferred Alternative, Vigor will conduct long-term stewardship activities to maintain the Vigor Shipyards Habitat Projects to ensure that it will continue for many years to provide sufficient long-term benefits that compensate for injury to natural resources and their services. The projects will result in minor to moderate direct beneficial environmental impacts to the Vigor Shipyards Habitat Projects sites and the natural resources that rely on the scarce habitat types being created by the Vigor Shipyards Habitat Projects. Juvenile salmonids and other fish will be able to rest and forage in the WW Bench Project as well as the SW Yard Project's new off-channel habitat. Migratory birds will be able to use the newly created riparian and upland habitat to feed and nest. The establishment of vegetation will likely result in minor, long-term benefits to air quality because vegetation can reduce local temperatures and enhance microclimates. The Trustees anticipate that the Preferred Alternative will likely result in long-term minor benefits to water quality as marsh vegetation becomes established and acts as a water filter. The visual impact of the created and enhanced habitat may result in minor, long-term benefits for recreational boaters in the LDR. Structure removal, remedial implementation, and habitat creation and maintenance associated with the Preferred Alternative may result in short-term and minor adverse impacts to riverbanks, air quality, sediments, and the water column mainly resulting from disturbances caused by construction equipment. Any impacts will be limited to periods when clean up, construction, and maintenance will be actively performed at the projects' property. Potential adverse impacts will be further lessened because activities to implement and maintain the Preferred Alternative will be undertaken in conjunction with best management practices (e.g., silt curtains, conducting in-water work when salmonids are not present, erosion control measures). For restoration work related to the Vigor Shipyards Habitat Projects, Vigor and Exxon will be required to seek and comply with all relevant permits from appropriate governmental entities.

4.3.2 Alternative B Conclusion

The Trustees determined that Alternative B, Accept the Vigor Shipyards Habitat Projects, meets all the Trustees' restoration screening criteria (See Table 1) and is consistent with the Trustees' restoration goals identified in the Final LDR RP and PEIS. Moreover, this alternative meets the purpose and need statement in Section 1.2 of this Final RP/EA. Based on their analysis, the Trustees anticipate that this alternative will result in beneficial direct and indirect long-term impacts to the environment by creating and preserving important habitat for natural resources. In light of the forgoing, Alternative B is the Preferred Alternative.



(View looking north of the West Waterway Habitat Bench Project. Photo credit: Michael Carlson, FWS)

4.4 Evaluation of Alternative C: Accept Only the West Waterway Habitat Bench Project

The Trustees evaluated the likely environmental impacts of Alternative C (Accept Only the West Waterway Habitat Bench Project) at the programmatic level in Section 9 of the Final LDR RP and PEIS. This information in the Final LDR RP and PEIS is incorporated in this Final RP/EA by reference. As contemplated in the Final LDR RP and PEIS, the following section of this Final RP/EA tiers from the Final LDR RP and PEIS to analyze likely environmental impacts specific to Alternative C.

4.4.1 Alternative C Environmental Impacts

It is likely that implementation of Alternative C, Accept Only the West Waterway Habitat Bench Project, will result in long-term direct and indirect minor benefits that will likely outweigh any short-term or long-term minor adverse impacts. Due to the relative size of Alternative C as compared to the Preferred Alternative and Alternative D, potential Alternative C beneficial and adverse impacts are expected to be lesser in magnitude as compared to impacts from the Preferred Alternative and Alternative D. Under Alternative C, Vigor will permanently protect, and maintain approximately 0.47 acres of intertidal habitat in the West Waterway, adjacent to Harbor Island. The intertidal habitat created under Alternative C is within an important migration corridor for salmonids and other fish where habitat is scarce. Fish will be able to use the intertidal habitat bench to feed and rest as they prepare to transition into the Puget Sound. Alternative C requires Vigor to perform monitoring and maintenance of the intertidal habitat and conduct long-term stewardship activities. These actions would be taken to preserve habitat

function to provide natural resource benefits into the future. The project will result in minor direct beneficial environmental impacts to the West Waterway in the vicinity of Alternative C and the natural resources that will use the Alternative C intertidal habitat. The Trustees anticipate that Alternative C will likely result in long-term minor benefits to water quality as aquatic vegetation serves as a filter and the new habitat substrate replaces contaminated materials. The Trustees do not anticipate any benefits to air quality from Alternative C. The visual impact of the created and enhanced habitat may result in negligible, long-term benefits for recreational boaters in the LDR. Structure removal, remedial implementation, and habitat creation and maintenance associated with Alternative C may result in short-term and minor adverse impacts to riverbanks, air quality, sediments and the water column. These short-term, minor adverse impacts will likely be associated with maintenance activities in and around the Alternative C footprint. Potential adverse impacts will be further lessened because activities to maintain Alternative C will use best management practices (e.g., silt curtains, conducting in-water work when salmonids are not present). Vigor and Exxon will be required to obtain and comply with all relevant permits from appropriate governmental entities for maintenance activities related to Alternative C.

4.4.2 Alternative C Conclusion

The Trustees determined that Alternative C, Accept Only the West Waterway Habitat Bench Project, meets some of the Trustees' restoration screening criteria, but does not meet the Trustees' criterion that the restoration alternative comply with all laws and policies (See Table 1). CERCLA, OPA, and CWA require that the Trustees compensate the public by restoring, replacing or acquiring the equivalent of those natural resources and their services injured by the release of hazardous substances or discharges of oil. Alternative C is not expected to provide the same level of ecological benefits that the Trustees have estimated are necessary to compensate for injuries to natural resources harmed by Vigor and Exxon's hazardous releases and oil discharges at the Vigor Harbor Island facility. Because it creates only intertidal habitat, Alternative C does not restore habitat that will provide a fuller set of functions and benefit the variety of resources injured by hazardous releases and oil discharges to the same extent as the Preferred Alternative or Alternative D. Accordingly, Alternative C does not meet the purpose and need.

4.5 Evaluation of Alternative D: Accept Only the Southwest Yard Habitat Project

The Trustees evaluated the likely environmental impacts of Alternative D (Accept Only the Southwest Yard Habitat Project) at the programmatic level in Section 9 of the Final LDR RP and PEIS. This information in the Final LDR RP and PEIS is incorporated in this Final RP/EA by reference. As contemplated in the Final LDR RP and PEIS, the following section of this Final RP/EA tiers from the Final LDR RP and PEIS to analyze likely environmental impacts specific to Alternative D.

4.5.1 Alternative D Environmental Impacts

The Trustees anticipate that implementation of Alternative D, Accept Only the Southwest Yard Habitat Project, will result in long-term direct and indirect minor to moderate benefits that will likely outweigh any short-term or long-term minor adverse impacts. Compared to Alternative C, Alternative D is likely to result in relatively greater beneficial and adverse impacts because Alternative D will be a physically larger project and result in a larger physical change to the LDR environment. Based on the size of Alternative D as compared to the Preferred Alternative, it is likely that Alternative D will produce less adverse and beneficial impacts than the Preferred Alternative because, unlike the Preferred Alternative, Alternative D will not include restoration in the West Waterway.

As part of Alternative D, Vigor and Exxon will permanently protect, and maintain approximately 2.67 acres of intertidal, marsh and riparian habitat on and adjacent to Harbor Island and adjacent to the West Waterway. Habitat created under Alternative D will create a mix of habitat types that are similar to the pre-industrial habitat conditions in the LDR and will benefit the variety of resources injured by hazardous releases and discharges of oil. The off-channel habitat will be accessible from the West Waterway for migrating salmon to feed and rest before they travel into the Puget Sound. Birds will be able to forage and nest in the riparian and marsh habitat. Under Alternative D, Vigor and Exxon will be required to monitor and maintain the habitat to preserve the habitat benefits that support injured natural resources. Additional long-term stewardship actions by Vigor and Exxon would be required to protect the habitat created under Alternative D into the future. The project will result in minor to moderate direct beneficial environmental impacts to the West Waterway in the vicinity of Alternative D and for those natural resources that will use Alternative D habitat. Vegetation established as part of Alternative D will likely result in minor, long-term benefits to air quality because vegetation can reduce local temperatures and enhance microclimates. Alternative D will also likely result in long-term minor benefits to water quality as marsh vegetation becomes established and acts as a water filter. The visual impact of the created and enhanced habitat may result in minor, long-term benefits for recreational boaters in the LDR. Structure removal, remedial implementation, and habitat creation and maintenance associated with Alternative D may result in short-term and minor adverse impacts to riverbanks, air quality, sediments and the water column mainly resulting from disturbances caused by construction equipment. These short-term, minor adverse impacts will likely be limited to the vicinity of Alternative D. Vigor and Exxon will be required to obtain and comply with all relevant permits from appropriate governmental entities for maintenance activities related to Alternative D. Best management practices will also be required for Alternative D implementation and maintenance activities, which will further reduce potential adverse impacts related to Alternative D.

4.5.2 Alternative D Conclusion

In light of their analysis, the Trustees found that Alternative D, Accept Only the Southwest Yard Habitat Project, meets some of the Trustees' restoration screening criteria, but does not meet the Trustees' criterion that the restoration alternative comply with all laws and policies (See Table 1). Under CERCLA, OPA, and CWA, the Trustees are required to compensate the public by restoring, replacing or acquiring the equivalent of those natural resources and their services injured by the release of hazardous substances or discharges of oil. The Trustees do not anticipate that Alternative D will provide sufficient ecological benefits to offset the injuries to

natural resources caused by Vigor and Exxon's releases of hazardous substances and oil discharges from the Vigor Harbor Island facility. Alternative D does not meet the purpose and need.

4.6 Cumulative Impacts

Cumulative impacts related to the Preferred Alternative, Alternative C, and Alternative D in the Final LDR RP and PEIS are documented in Section 9.2 of the Final LDR RP and PEIS. The cumulative impacts analysis in the Final LDR RP and PEIS is incorporated in this Final RP/EA by reference. This section tiers from the Final LDR RP and PEIS cumulative impacts analysis to discuss project-specific cumulative impacts.

Because the Preferred Alternative is anticipated to restore, replace or acquire the equivalent of injured natural resources and lost services, the Preferred Alternative's cumulative impact is long-term and beneficial. The Preferred Alternative includes the creation and protection of approximately 3.14 acres of mixed habitat in the LDR, including riparian, intertidal and marsh. These habitat types are important for natural resources injured by releases of hazardous substances and discharges of oil in the LDR. The Preferred Alternative serves as a refuge for natural resources present at a predominantly industrial site. Because Alternatives C and D also involve habitat restoration and creation, 0.47 and 2.67 acres respectively, Alternatives C and D are also anticipated to result in cumulative long-term beneficial impacts at a lesser scale than the Preferred Alternative.

The cumulative impacts analysis in this Final RP/EA is commensurate with the degree of direct and indirect environmental impacts that are a likely result of the Preferred Alternative, Alternative C and Alternative D. The Trustees anticipate that the Preferred Alternative will result in predominantly beneficial impacts to the environment and, therefore, this analysis focuses on the incremental effects of the Preferred Alternative in the context of other remedial and restoration activities in the LDR. The Preferred Alternative is one component of a potential suite of restoration actions to be taken in the LDR and its vicinity. Additionally, the LDR is subject to related CERCLA remedial activities and source control measures conducted by the EPA and the Washington State Department of Ecology. As discussed in Section 3.3 of this Final RP/EA, the Preferred Alternative has been and will be subject to remedial activities as part of the TSSOU. Potential future remedial and source control actions at other locations in the LDR could contribute to the cumulative effects of the Preferred Alternative and could result in increased beneficial environmental effects such as improved water quality. Alone, or in combination with future restoration and remedial activities conducted pursuant to federal and/or state law, it is unlikely that the Preferred Alternative will result in significant cumulative impacts to the human environment. The Preferred Alternative's physical footprint of approximately 3.14 acres is a relatively small area in the context of the LDR. It will be an area permanently altered from industrial shipyard infrastructure to habitat, but given the size of the LDR, creation and enhancement of habitat as part of the Preferred Alternative will have negligible, or at most minor impacts, to the recreation, land-use and economic activity in the LDR. The conversion of the land use related to the Preferred Alternative is minor even when considered in conjunction with the impacts of other potential remedial and restoration activities in the LDR.

Minor or negligible short-term impacts on air quality, water quality, soil and sediments can be anticipated as a result of active habitat creation and maintenance associated with the Preferred Alternative. These minor or negligible short-term impacts are unlikely to result in cumulative adverse environmental impacts because the Preferred Alternative, and any other concurrent restoration or remedial action, would be conducted using best management practices designed to minimize adverse environmental impacts. Any minor short-term impacts are likely to be offset by the Preferred Alternative's minor long-term beneficial impacts to the environment.

The potential cumulative impacts under Alternatives C and D would likely be the same types of impacts as discussed above in relation to the Preferred Alternative. Under Alternatives C and D a smaller area of the LDR would be impacted by restoration than under the Preferred Alternative and, in turn, the potential cumulative impacts are anticipated to be of a smaller magnitude. Both alternatives would result in minor impacts less than those described above for the Preferred Alternative because Alternatives C and D are smaller scale restoration actions, with fewer actions needed to complete restoration and smaller physical footprints, compared to the Preferred Alternative.

5. Coordination

Muckleshoot Indian Tribe

Suquamish Tribe

National Oceanic and Atmospheric Administration

U.S. Fish and Wildlife Service

Washington Department of Ecology

Washington Department of Fish and Wildlife

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