



Portland Harbor Final Supplemental Restoration Plan and Environmental Assessment

Tiered from the Final Portland Harbor Programmatic
Environmental Impact Statement and Restoration Plan

Prepared by
National Oceanic and Atmospheric Administration,
Lead Federal Agency and Administrative Trustee

Cooperating Agencies and Tribes
U.S. Department of the Interior, Fish and Wildlife Service; State of Oregon,
acting through the Oregon Department of Fish and Wildlife; Confederated
Tribes of the Grand Ronde Community of Oregon; Confederated Tribes of Siletz
Indians; Confederated Tribes of the Umatilla Indian Reservation; Confederated
Tribes of the Warm Springs Reservation of Oregon; Nez Perce Tribe

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With support from
Parametrix

Portland Harbor Final Supplemental Restoration Plan and Environmental Assessment

Prepared by

National Oceanic and Atmospheric Administration

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PORTLAND HARBOR FINAL SUPPLEMENTAL RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

Project Location	Portland Harbor Assessment Area (Willamette River, river mile 0.8 to river mile 12.3 including the upper 1.2 miles of Multnomah Channel) and Broader Focus Area (see Figure 1). Together, these are referred to as the Restoration Service Area.
Lead Federal Agency	The National Oceanic and Atmospheric Administration (NOAA)
Lead Administrative Trustee	NOAA
Cooperating Agencies and Tribes	<ul style="list-style-type: none">• U.S. Department of the Interior, Fish and Wildlife Service (DOI, USFWS)• State of Oregon, acting through the Oregon Department of Fish and Wildlife• Confederated Tribes of the Grand Ronde Community of Oregon• Confederated Tribes of Siletz Indians• Confederated Tribes of the Umatilla Indian Reservation• Confederated Tribes of the Warm Springs Reservation of Oregon• Nez Perce Tribe
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Abstract

This Final Supplemental Restoration Plan and Environmental Assessment (Final Supplemental Restoration Plan) uses criteria established in the 2017 Portland Harbor Programmatic Environmental Impact Statement and Restoration Plan to evaluate and select specific restoration alternatives and evaluates potential environmental impacts from those alternatives. The Preferred Alternative selected is the Restoration Bank Credit Alternative which includes the purchase of credits by the Portland Harbor Trustee Council with funds received by the Trustee Council from a potentially responsible party in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement. This Final Supplemental Restoration Plan also describes the status of the Portland Harbor Natural Resource Damage Assessment process and the five restoration banking projects that were submitted in response to the Trustee Council's Request for Proposals for ecological restoration projects.

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KEY TERMS

BT	Benefit transfer
BTEX	Benzene, toluene, ethylbenzene, and xylene
CAG	Community Advisory Group
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CRG	Columbia Restoration Group
CWA	Clean Water Act
DDD	Dichloro-diphenyl-dichloroethane
DDE	Dichloro-diphenyl-dichloroethylene
DDT	Dichloro-diphenyl-trichloroethane
DEQ	Oregon Department of Environmental Quality
DOI	Department of the Interior
DPS	Distinct Population Segment
DSAY	Discounted service acre-years
DSL	Department of State Lands
EA	Environmental assessment
EFH	Essential Fish Habitat
EIS	Environmental impact statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FWCA	Fish and Wildlife Coordination Act
GHG	Greenhouse gas
HEA	Habitat equivalency analysis
LCR	Lower Columbia River
LWC	Linnton Water Credits, LLC
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MTBE	Methyl tertiary-butyl ether
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service

KEY TERMS (CONTINUED)

NOAA	National Oceanic and Atmospheric Administration
NRDA	Natural Resource Damage Assessment
OPA	Oil Pollution Act
ORS	Oregon Revised Statute
PAH	Polycyclic aromatic hydrocarbons
PAS	Preassessment Screen
PCB	Polychlorinated biphenyls
PGE	Portland General Electric
PHAA	Portland Harbor Superfund Assessment Area
PHH	Portland Harbor Holdings III, LLC
PRP	Potentially responsible party
REA	Resource equivalency analysis
RFP	Request for Proposals
SHPO	State Historic Preservation Office
SOC	Substances of concern
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

Introduction

In May 2017, The Portland Harbor Natural Resource Trustee Council (Trustee Council) published its *Final Portland Harbor Programmatic EIS and Restoration Plan* (Programmatic Restoration Plan; NOAA 2017) to identify an overall restoration approach, define the framework to implement the Trustee Council's integrated restoration strategy, and provide analysis of the environmental impacts associated with the potential restoration efforts. This Final Supplemental Restoration Plan and Environmental Assessment (Final Supplemental Restoration Plan) uses the criteria established in the Programmatic Restoration Plan to evaluate and select specific restoration action alternatives and evaluates potential environmental impacts from those alternatives.

Background and Status of Portland Harbor Natural Resource Damage Assessment

Since the 1900s, industrial facilities along the Willamette River at Portland Harbor have released an array of hazardous substances and discharged oil into the river system. In December 2000, the Environmental Protection Agency (EPA) listed Portland Harbor on the National Priorities List due to elevated concentrations of contaminants. Two months later, the natural resource trustees entered into an intergovernmental memorandum of understanding with the EPA and the Oregon Department of Environmental Quality (DEQ) to coordinate efforts at the Portland Harbor Superfund Site. In 2002, the natural resource trustees established the Trustee Council.

The restoration action alternatives discussed in this document arose from the ongoing Natural Resource Damage Assessment (NRDA) process being conducted by the Trustee Council within what is now referred to as the Portland Harbor Superfund Assessment Area (PHAA). The PHAA includes the Willamette River from river mile 0.8 to river mile 12.3 and the upper 1.2 miles of Multnomah Channel. The purpose of the NRDA is to identify and quantify injuries caused by releases of hazardous substances and discharges of oil in the PHAA. The Trustee Council took the first step in the formal NRDA process in January 2007 with the issuance of a Preassessment Screen (PAS) for the PHAA (PHNRTC 2007). The Trustee Council gave notice of its intent to conduct an assessment of injury and damages in January 2008 and subsequently developed an Assessment Plan in June 2010 to guide performance of the assessment.

To encourage cooperation with potentially responsible parties (PRPs) during the NRDA process, the Trustee Council is following a phased approach. Phase 1 included developing the Assessment Plan, conducting early scientific studies, performing literature and data review, and developing a strategy for determining the liability of cooperating PRPs interested in early settlement. Phase 2 is the implementation of a settlement-oriented work plan. Phase 3 is the completion of the NRDA, and Phase 4 is the recovery of damages from non-settling PRPs. The Trustee Council is currently engaged in Phase 2. This settlement-oriented assessment phase includes a natural resource damage-specific allocation to enable the Trustee Council and individual parties to settle natural resource damages liability early.

As part of Phase 2, the Trustee Council quantified or qualitatively characterized natural resource injuries and lost services and identified the type, scale, and cost of restoration sufficient to compensate the public for these losses. Losses and gains are expressed in terms of present value units of the diminished

resource itself – discounted service acre-years (DSAYs). A combination of habitat equivalency analysis (HEA), resource equivalency analysis (REA) and benefit transfer (BT) were employed to determine injuries and assign damages to PRPs.

Phase 2 ecological losses were measured through relationships between sediment contaminant concentrations and estimated service losses associated with effects on biological organisms. Because environmental losses and gains are not experienced at a single point in time, HEA accounts for changes in contaminant concentrations over time. The HEA was based on a review of scientific literature, technical data, applicable regulatory standards, and the results of Trustee Council studies to identify concentrations above which hazardous substances have effects on key species or species groups. With the completion of the Phase 2 HEA, the Trustee Council’s remaining task is to apply the HEA results to specific physical locations and specific PRPs.

Phase 2 also indicated a reduction in the quality of fishing for resident species, sturgeon, and anadromous species, and the quality of recreational boating. The tribal members of the Trustee Council also reported contamination and loss of fish species of primary importance in the Portland Harbor.

The Trustee Council notes that the use of HEA, REA, and BT, as well as the equitable allocations made to assign damages to individual PRPs, were only intended to facilitate early settlements. Assessment activities conducted in Phase 3 and beyond may rely on different tools and techniques and may result in a refined set of conclusions.

Proposed Action, Purpose and Need for Action

The proposed federal action under the National Environmental Policy Act (NEPA) addressed in this Final Supplemental Restoration Plan is the purchase of credits from restoration banks (Restoration Bank Credit Alternative). This action includes purchase of credits by the Trustee Council with funds received by the Trustee Council from a PRP in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement. Active restoration is necessary to compensate the public for any natural resource injuries resulting from releases of hazardous substances and discharges of oil from the site by numerous PRPs who own, or have owned, operated, or are operating, facilities in and along the Willamette River. A restoration plan is necessary to facilitate effective restoration actions and to comply with NEPA. This restoration plan will accomplish the following:

- Meet statutory objectives of restoring, replacing, rehabilitating, or acquiring the equivalent of natural resources and services potentially injured or destroyed as a result of releases of hazardous substances and discharges of oil.
- Provide a diversity of sustainable habitat types within the PHAA to enhance fish and wildlife resources potentially injured by releases of hazardous substances and discharges of oil.

This Final Supplemental Restoration Plan proposes specific restoration actions that will meet these goals.

Relationship to Programmatic Restoration Plan

This Final Supplemental Restoration Plan picks up where the Programmatic Restoration Plan left off. The Programmatic Restoration Plan describes the Preferred Alternative for restoration in broad terms, but also lays out in detail a process by which the Trustee Council will select specific restoration projects and

the criteria by which they will be evaluated. Using the programmatic approach, goals, objectives, and selection criteria identified in the Programmatic Restoration Plan, the Trustee Council is now ready to evaluate more specific options for an initial round of restoration implementation in anticipation of certain early settlements with PRPs.

In the Programmatic Restoration Plan, the Trustee Council describes several ways that a PRP can provide restoration to resolve its liability for damages at Portland Harbor, including PRP project implementation, PRP credit purchases, or PRP providing funds to the Trustee Council for restoration. After receiving settlement funds from a PRP, the Trustee Council would then convert the settlement funds to restoration by one of the following options:

- Lead restoration project implementation, where the Trustee Council would use settlement funds to design and construct a restoration project themselves.
- Partner with non-Trustee entities who are implementing restoration, where the Trustee Council would provide settlement funds to a third party proposing to develop and implement a restoration project.
- Purchase credits from restoration banks, whereby the Trustee Council would purchase ecological benefits, in the form of credits.

In this Final Supplemental Restoration Plan, the Trustee Council proposes a Preferred Alternative that would best meet the goals and objectives identified in the Programmatic Restoration Plan. The Trustee Council anticipates using this alternative as the basis for settlements with PRPs.

In this Final Supplemental Restoration Plan the Trustee Council also reviews a list of eligible restoration projects that fit the Preferred Alternative.

Restoration Evaluation Process

On January 15, 2020, the Trustee Council published a Request for Proposals (RFP) for ecological restoration projects that outlined the eligibility and evaluation criteria that would be used to select specific restoration actions. Five responses to the RFP were received; all five were related to restoration banks. The following restoration banks were included in the responses: Alder Creek Restoration Project, Harborton Habitat Development Project, Linnton Mill Restoration Site, Miller Creek Restoration Project, and Rinearson Natural Area. The Trustee Council received no responses proposing non-restoration bank projects. Accordingly, there is effectively only one action alternative considered further in this Final Supplemental Restoration Plan, the Restoration Bank Credit Alternative. The Restoration Bank Credit Alternative and the No-Action Alternative are evaluated in this document, and the Restoration Bank Credit Alternative is the Preferred Alternative.

Affected Environment

The affected environment consists of two parts: the PHAA and the Trustee Council's Broader Focus Area for restoration, collectively referred to together as the Restoration Service Area. The PHAA extends from river mile 0.8 to river mile 12.3 on the Willamette River and includes the upper 1.2 miles of Multnomah Channel. The Broader Focus Area includes the Willamette River from the southern end of the PHAA, at river mile 0.8, upstream to Willamette Falls, and it includes the immediate confluences of major tributaries (Johnson Creek, Tryon Creek, the Clackamas River, and Kellogg Creek), the lower Columbia

River on the Oregon side from the east end of Hayden Island to the Multnomah Channel outlet (including a portion of the western end of Hayden Island), all of Multnomah Channel, and portions of Scappoose Bay.

The lower Willamette River was historically about 0.5 miles wide, with banks dominated by beaches and wetlands and a large shoal along the east riverbank. Much of the Willamette River at Portland Harbor is modified, and the surrounding area is highly urbanized with little natural habitat remaining. The Portland metropolitan area historically relied on the Portland Harbor to expand commerce and industrialization as a seaport for timber and grain. By 2011, activities in the harbor were supporting nearly 18,000 jobs, created \$1.5 billion of personal wage and salary income, and generated \$1.47 billion in income earned by Portland-area businesses and workers as a result of spending by harbor-related businesses (PBA 2013).

Environmental Consequences

This Final Supplemental Restoration Plan assesses potential environmental impacts associated with the restoration alternatives for Portland Harbor: Restoration Bank Credit Alternative (purchasing credits from restoration banks) as the Preferred Alternative or the No-Action Alternative (taking no action). The analysis is summarized in the table below. The Preferred Alternative is unlikely to have significant adverse impacts on the environment. This alternative would meet the mandates under NRDA statutes and regulations to restore natural resources and services injured by releases of hazardous substances and discharges of oil and is consistent with the goals and objectives outlined in the Programmatic Restoration Plan. The No-Action Alternative would not have direct beneficial effects or adverse impacts but would allow the degraded conditions of habitats in the Restoration Service Area to continue which would not be consistent with the Programmatic Restoration Plan.

Summary of Environmental Impact Analysis for the No-Action and Restoration Bank Credit Alternatives

Resource Area	Term	No-Action	Restoration Bank Credits
Land Use	Short	None	Minor (-)
	Long	None	Minor (-) and (+)
Shoreline Use	Short	None	Minor to moderate (-)
	Long	None	Minor to moderate (+)
Aesthetics	Short	None	Minor to moderate (-)
	Long	None	Minor to moderate (+)
Socioeconomics	Short	None	None to minor (-) and (+)
	Long	None	None to moderate (-) and (+)
Cultural and Historic Resources	Short	None	None
	Long	None	Minor to moderate (-) and (+)
Energy	Short	None	None
	Long	None	None
Geologic and Soil Resources	Short	None	Minor (-)
	Long	None	Minor (+)

Resource Area	Term	No-Action	Restoration Bank Credits
Recreation	Short	None	Minor (-)
	Long	None	Minor to moderate (-) and (+)
Transportation, Utilities, and Public Services	Short	None	Minor (-)
	Long	None	None
Wetlands	Short	None	Minor (-)
	Long	None	Minor to moderate (+)
Biological Resources	Short	None	Minor (-)
	Long	None	Major (+)
Air Quality	Short	None	Minor (-)
	Long	None	Minor (+)
Climate	Short	None	Minor (-)
	Long	None	Minor (+)
Environmental Health and Noise	Short	None	Minor (-)
	Long	None	Minor (+)
Floodplain and Flood Control	Short	None	Minor (-)
	Long	None	Minor (+)
Water Quality	Short	None	Minor (-)
	Long	None	Minor to moderate (+)

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1. INTRODUCTION

1.1 Background

In May 2017, The Portland Harbor Natural Resource Trustee Council¹ (Trustee Council) published its *Final Portland Harbor Programmatic EIS and Restoration Plan* (NOAA 2017) (Programmatic Restoration Plan). The document guides the Trustee Council’s restoration of natural resources injured by releases of hazardous substances and discharges of oil at the Portland Harbor Superfund Assessment Area (PHAA, see Figure 1). Through the Programmatic Restoration Plan, the Trustee Council accomplished three primary goals.

First, the Programmatic Restoration Plan identifies an overall restoration approach: integrated habitat restoration planning. This approach focuses on restoring certain types of habitat that support a range of species and associated natural resource services that have been injured as a result of releases of hazardous substances and discharges of oil into Portland Harbor. The Trustee Council also considered a species-specific approach to restoration, and as required by law, a natural recovery or “no-action” alternative. After thorough review and careful consideration, the Trustee Council determined that integrated habitat restoration would be the most effective strategy to restore the injured resources.

Second, the Programmatic Restoration Plan lays out a comprehensive framework for implementing the Trustee Council’s integrated habitat restoration approach. The document provides a detailed list of criteria—from geographic constraints to ecological goals to legal considerations—that the Trustee Council would use to evaluate specific restoration actions or categories of actions. In order to guide the process and illustrate restoration alternatives, the Programmatic Restoration Plan also includes a “restoration portfolio” made up of projects and potential projects that the Trustee Council would use as exemplars of the types of restoration considered desirable.

¹ The members of the Trustee Council are described in Section 1.3. The Confederated Tribes and Bands of the Yakama Nation, although a trustee for Portland Harbor, has withdrawn from the Trustee Council and is no longer participating in the restoration planning efforts described in the Programmatic Restoration Plan or this Supplemental Restoration Plan.



Figure 1. The PHAA and Broader Focus Area Comprise the Restoration Service Area

In the Programmatic Restoration Plan, the Trustee Council describes three ways that a potentially responsible party (PRP)² can provide restoration to resolve its liability for damages at Portland Harbor, including PRP project implementation, PRP credit purchases from a restoration bank, or a PRP providing funds to the Trustee Council for restoration.³ In the third case, where the Trustee Council receives settlement funds from a PRP, the Trustee Council could convert the settlement funds to restoration by one of three restoration alternatives, which form the basis of the Trustees' evaluation and are discussed throughout this Final Supplemental Restoration Plan as follows:

- Trustee-Led Project Alternative – The Trustee Council would use settlement funds to design and construct a restoration project.
- Partnering Project Alternative – The Trustee Council would provide settlement funds to a third-party entity to develop and implement a restoration project.
- Restoration Bank Credit Alternative – The Trustee Council would purchase ecological benefits, in the form of credits, from a restoration bank. For the purposes of this Final Supplemental Restoration Plan, the Restoration Bank Credit Alternative also covers the scenario listed above where a PRP proposes to resolve its liability by purchasing restoration bank credits.

Third, the Programmatic Restoration Plan provides a broad analysis of the environmental impacts associated with the types of restoration described throughout the document, specifically with the types included in the restoration portfolio. This analysis is required under the National Environmental Policy Act (NEPA) for any major federal action that has the potential to significantly impact the environment. The Trustee Council ultimately concluded that the restoration types discussed in the Programmatic Restoration Plan are unlikely to have significant adverse environmental impacts. However, the Trustee Council did not select specific restoration actions in the Programmatic Restoration Plan; therefore, they concluded, further environmental analysis may be required when specific actions are selected.

This Final Supplemental Restoration Plan and Environmental Assessment (Final Supplemental Restoration Plan) picks up where the Programmatic Restoration Plan left off. In this Final Supplemental Restoration Plan, the Trustee Council uses the criteria identified in the Programmatic Restoration Plan to evaluate and select for implementation one of the three restoration actions identified in that document. These potential restoration actions are the alternatives analyzed in this Final Supplemental Restoration Plan. The Federal Trustees, NOAA and DOI, (see Chapter 5) also conduct an environmental impacts analysis of each restoration alternative in order to satisfy their obligations under NEPA.

After completion of this Final Supplemental Restoration Plan, the Trustee Council anticipates using the Preferred Alternative as the basis for settlements with PRPs. This may be accomplished in two ways: (1) a PRP may directly fund restoration if its desired restoration is consistent with the Trustee Council's

² A potentially responsible party, or PRP, is an entity that meets the statutory requirements for liability under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). 42 U.S.C. § 9607. For the purposes of this document, PRPs are the parties responsible for releases of hazardous substances and discharges of oil into the PHAA that are liable for any resulting injuries to natural resources.

³ The one scenario not covered by this Supplemental Restoration Plan is where a PRP proposes to resolve its liability by implementing a restoration project. If the Trustee Council receives a proposal of this type, the Trustee Council would conduct a separate restoration planning analysis, which would be subject to public review and comment.

Preferred Alternative, or (2) a PRP may pay money directly to the Trustee Council to conduct restoration, allowing the Trustee Council to conduct restoration with those funds, consistent with the Trustee Council's Preferred Alternative.

1.1.1 Geographic Boundaries

Section 3 of the Programmatic Restoration Plan, which is incorporated here by reference, contains an exhaustive description of the PHAA and the Trustee Council's Broader Focus Area for restoration, which together comprise the Restoration Service Area (see Figure 1). The PHAA and Broader Focus Area are further described in Sections 4.1.2 and 4.1.3, respectively.

1.2 Site Overview

This section provides a brief summary of the status and history of the PHAA. Section 1 of the Programmatic Restoration Plan contains a more detailed discussion and is incorporated here by reference.

Since the 1900s, industrial facilities along the Willamette River at Portland Harbor have released an array of hazardous substances and discharged oil into the river system. In December 2000, the Environmental Protection Agency (EPA) listed Portland Harbor on the National Priorities List (see Section 6.1) due to elevated concentrations of polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbons (PAHs), dichloro-diphenyl-trichloroethane (DDT) and other pesticides, heavy metals, semi-volatile organic compounds and other contaminants. Two months later, the natural resource trustees (see Section 1.3) entered into an intergovernmental memorandum of understanding with EPA and the Oregon Department of Environmental Quality (DEQ) to coordinate efforts at Portland Harbor. In 2002, the natural resource trustees established the Portland Harbor Natural Resource Trustee Council.

The Trustee Council is developing a Natural Resource Damage Assessment (NRDA) process to determine (1) the extent and magnitude of natural resource injuries and associated lost services resulting from releases of hazardous substances and discharges of oil from the PHAA, and (2) the type and scale of restoration that would compensate for those injuries. The NRDA is being conducted pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the Oil Pollution Act of 1990 (OPA), the Clean Water Act (CWA), and other applicable laws. While the NRDA process (described in detail in Section 2.1) is not yet complete, the Trustee Council anticipates settling claims against one or more PRPs in the near future, creating the necessity for this Final Supplemental Restoration Plan. The type and scale of restoration conducted under this plan will depend on the specifics of settlements reached with individual PRPs at the PHAA.

1.3 Natural Resource Trustees

Natural resource trustees act on behalf of the public to address injuries to natural resources. The natural resource trustees for Portland Harbor established the Trustee Council, which operates under the 2002 Trustee Council Memorandum of Agreement and currently consists of representatives of eight trustees:

- U.S. Department of Commerce, acting through the National Oceanic and Atmospheric Administration (NOAA)
- U.S. Department of the Interior
- State of Oregon, acting through the Oregon Department of Fish and Wildlife (ODFW)

- Confederated Tribes of the Grand Ronde Community of Oregon
- Confederated Tribes of Siletz Indians
- Confederated Tribes of the Umatilla Indian Reservation
- Confederated Tribes of the Warm Springs Reservation of Oregon
- Nez Perce Tribe

The Trustee Council members and the NRDA process that they conduct is independent of the cleanup/remedial process being undertaken by federal and state cleanup agencies. For a full discussion of the relationship between these two processes, please refer to Section 1.6 of the Programmatic Restoration Plan. In addition, the Programmatic Restoration Plan contains a detailed discussion of the overall NRDA process. For more information on that topic, including the complete restoration planning process undertaken by the Trustee Council prior to publication of the Programmatic Restoration Plan, please refer to Sections 1.7 and 1.8 of that document.

NOAA serves as the lead federal agency to guide the restoration planning process and for NEPA compliance for the Programmatic Restoration Plan and this Final Supplemental Restoration Plan. The U.S. Fish and Wildlife Service (USFWS), a bureau within the U.S. Department of the Interior, is a cooperating agency, and state and tribal members of the Trustee Council were also involved in developing this document.

1.4 Proposed Action, Purpose and Need for Action

The proposed federal action under NEPA addressed in this Final Supplemental Restoration Plan is the purchase of credits from restoration banks. This action includes purchase of credits by the Trustee Council with funds received by the Trustee Council from a PRP in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement. Active restoration, such as the Preferred Alternative, is necessary to compensate the public for any natural resource injuries resulting from releases of hazardous substances and discharges of oil from the site by numerous PRPs who own, have owned, have operated, or are operating facilities in and along the Willamette River. This restoration planning process also provides the public with an opportunity to review and comment on the restoration alternatives considered by the Trustee Council under CERCLA, OPA, and their implementing regulations.

A restoration plan is necessary to facilitate effective restoration actions and to comply with NEPA. The restoration approach for the NRDA is based on the Trustee Council's combined knowledge of the natural processes of the environments present in and adjacent to the Willamette River, the nature and extent of contamination, and current plans for cleanup actions by response agencies.⁴ In addition, the factors responsible for wetlands loss, the techniques available for restoration, and experience gained from

⁴ Response agencies are those agencies charged with removing contaminants from the environment, also known as cleanup. For Portland Harbor, the response agencies are the EPA and DEQ.

previous restoration projects in the lower Willamette River inform the plan. This Final Supplemental Restoration Plan accomplishes the following:

- Identifies a preferred restoration alternative that, when implemented, will meet statutory objectives of restoring, replacing, rehabilitating, or acquiring the equivalent of natural resources and services injured or destroyed as a result of releases of hazardous substances and discharges of oil.
- Provides a diversity of sustainable habitat types to enhance fish and wildlife resources injured by releases of hazardous substances and discharges of oil from the PHAA.

This Final Supplemental Restoration Plan proposes specific restoration actions that will meet these goals.

1.5 Legal Mandates and Authorities

1.5.1 NRDA-Related Authorities

CERCLA, 42 U.S.C. §§ 9601 *et seq.*; the OPA of 1990, 33 U.S.C. §§ 2701 *et seq.*; the CWA, 33 U.S.C. § 1251; the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan), 40 C.F.R. Part 300, Subpart G; Executive Orders 12580 and 12777; and other applicable federal and state laws and regulations provide a legal framework for addressing injuries to the nation's natural resources resulting from releases of hazardous substances and discharges of oil. CERCLA and OPA establish liability for injury to, destruction of, loss of, or loss of use of natural resources caused by releases of hazardous substances and discharges of oil and authorize recovery of monetary damages for such injuries. Those statutes designate categories of natural resource trustees⁵ and direct those trustees to assess injuries to resources and to recover damages for those injuries. Natural resource damages include the cost of restoring, rehabilitating, replacing, or acquiring the equivalent of the injured resources (restoration), including the services provided by those resources and the reasonable costs of assessing the injuries. Except for the portion of the recovery that represents the reasonable costs of assessment, both statutes mandate that damages may only be used for restoration. 42 U.S.C. § 9607; 33 U.S.C. §§ 2702, 2706.

The regulations implementing the natural resource damages provisions of CERCLA and OPA provide further guidance on the NRDA process. Although the OPA NRDA regulations, 15 C.F.R. Part 990, and the CERCLA NRDA regulations, 43 C.F.R. Part 11, are not identical, both sets of regulations discuss two types of restoration: primary and compensatory restoration. Primary restoration is any action taken to enhance the return of injured natural resources and services to their baseline, that is, the condition or level that would have existed had the releases of hazardous substances and discharges of oil not occurred. In many instances, the response and remedial actions undertaken at a site are sufficient to serve the purpose of primary restoration with natural recovery taking place within a reasonable period of time after actions are complete. As part of restoration planning for the PHAA, the Trustee Council will consider the extent to which response actions undertaken as part of EPA's remedial process may be sufficient to allow natural resources and services to return to baseline without primary restoration actions by the Trustee Council. The Trustee Council is providing input to EPA in order to decrease the

⁵ Under CERCLA, natural resource trustees include federal, state, and Indian tribal trustees. 42 U.S.C. § 9607. Under OPA, the natural resource trustees include federal, state, Indian tribal and foreign trustees. 33 U.S.C. § 2706. Portland Harbor has no foreign trustees.

need for primary restoration actions. Therefore, our focus in this document is on compensatory restoration.

Compensatory restoration addresses losses from the start of the injury until resource recovery to baseline is complete. Compensatory restoration is important because during the time a resource is injured, it is unable to provide the full range of services to other parts of the environment or to the public. The type and scale of compensatory restoration is informed by the nature of the primary restoration, if any, and the rate of recovery of the injured natural resources or services given the primary restoration action.

Both CERCLA and OPA require natural resource trustees to develop a plan for implementing restoration and further direct that implementation cannot occur until there has been adequate public notice, opportunity for a hearing, and consideration of all public comment.⁶ 42 U.S.C. § 9611(i); 33 U.S.C. § 2706 (c)(5).

1.5.2 NEPA Authority

While CERCLA and OPA provide the underpinnings for the Trustee Council’s restoration actions, a third environmental statute also plays a critical role—NEPA, 42 U.S.C. §§ 4321, *et seq.* Congress enacted NEPA in 1969 to establish a national policy for the protection of the environment. NEPA requires an assessment of any federal action that may impact the environment, and it established the Council on Environmental Quality (CEQ) to advise the President and to carry out certain other responsibilities relating to implementation of NEPA by federal agencies. Pursuant to Executive Order 11514, federal agencies are obligated to comply with NEPA regulations adopted by the CEQ, 40 C.F.R. 1500–1508. These regulations outline the responsibilities of federal agencies under NEPA and provide specific procedures for preparing environmental documentation to comply with NEPA⁷.

1.6 Relationship between the NRDA and NEPA Processes

NEPA applies to restoration actions undertaken by federal trustees. The Trustee Council has integrated the CERCLA, OPA, and NEPA processes in this Final Supplemental Restoration Plan, as it did in the Programmatic Restoration Plan. This integrated process allows the Trustee Council to meet the public involvement requirements of these three statutes concurrently. This Final Supplemental Restoration Plan complies with NEPA by (1) describing the proposed action, purpose, and need for restoration in Chapter 1, (2) summarizing the current environmental setting in Chapter 4 (Affected Environment), (3) identifying alternatives and analyzing potential environmental impacts in Chapter 3 (Restoration Alternatives) and Chapter 5 (Environmental Consequences), and (4) summarizing public participation in Section 1.7 (Public Participation).

⁶ CERCLA provides an exception to this requirement for situations “requiring action to avoid an irreversible loss of natural resources or to prevent or reduce any continuing danger to natural resources....” 42 U.S.C. § 9611(i). The OPA regulations also provide for emergency restoration, but require trustees to provide public notice “to the extent practicable.” 15 C.F.R. § 990.26.

⁷ The CEQ issued revised regulations for federal agencies to implement NEPA, which became effective on September 14, 2020 (85 FR 43304). Because the Federal Trustees’ environmental review discussed herein commenced before September 14, 2020, this Final SRP/EA utilizes earlier 1978 CEQ NEPA regulations rather than the recently revised regulations.

This document supplements the Programmatic Restoration Plan, which was intended to expedite and provide a point of departure for future analyses. This Final Supplemental Restoration Plan relies on the framework set out in the Programmatic Restoration Plan and conducts the project-level NRDA and NEPA analyses that will permit the Trustee Council to move forward with specific restoration actions.

1.7 Public Participation

Public participation is an important part of the restoration planning process and is required under NEPA and CEQ regulations (40 C.F.R. §§ 1500–1508). As part of the process to develop the Programmatic Restoration Plan, the Trustee Council sought public input during its preparation for draft publication in 2012 and finalization in 2017. In addition, the Trustee Council created opportunities for public involvement during other stages of restoration planning, such as the development of the Ecological Restoration Portfolio ([Appendix A](#)⁸ of the Programmatic Restoration Plan).

The Trustee Council maintains a [public website](#)⁹ with information on the NRDA. This site is updated periodically and provides a forum for the public to access documents and view notices about upcoming public meetings.

Ongoing outreach by the Trustee Council to the general public includes newsletters, maintenance of an email list that includes approximately 300 subscribers, hosting and attending public meetings, press releases, attendance and annual presentations at the Portland Harbor Community Advisory Group (CAG) meetings, occasional attendance at Portland Harbor Community Coalition meetings and events, tabling at various river-focused community events in Portland (such as SeaPort Celebration, Sundown at Ecotrust, RiverFest, and others) and presentations at local and regional professional conferences (such as Urban Ecological Research Consortium, Within Our Reach, and Oregon Brownfields Conference).

1.7.1 Request for Proposals

On January 15, 2020, the Trustee Council published a Request for Proposals (RFP) for ecological restoration projects. The RFP outlined the eligibility and evaluation criteria that would be used to select specific restoration actions. The RFP was posted on the Trustee Council's website, distributed via the Trustee Council's electronic newsletter, and posted to the Portland Harbor CAG website. The criteria outlined in the RFP are discussed below in Chapter 3, and the RFP is attached as Appendix A. The open period for the RFP ended on March 2, 2020. The Trustee Council reviewed the proposals that were submitted relative to the eligibility and evaluation criteria and developed this Final Supplemental Restoration Plan. The proposals sent in response to the RFP form the basis of the evaluation in this document.

1.7.2 Public Review of the Supplemental Restoration Plan

Public comment was accepted on the Draft Supplemental Restoration Plan for 30 days, ending on September 14, 2020. Comments were submitted via email to Portlandharbor.nrda@gmail.com and by using the comment form available on the [Trustee Council website](#).⁷ Comments were also able to be accepted via mail, but none was submitted via mail.

⁸ https://www.fws.gov/portlandharbor/sites/default/files/documents/RestorationPort_AppA.pdf

⁹ <https://www.fws.gov/portlandharbor/>

All comments were required to include a name and address. The full comments, including any personal information provided, will become part of the public administrative record. Responses to the comments are included in Appendix C, and the full comments are included in Appendix D. No comments resulted in changes from the Draft to the Final Supplemental Restoration Plan.

1.8 Administrative Record

This Final Supplemental Restoration Plan references a number of documents prepared by and for the Trustee Council and through the NEPA and NRDA processes. These documents (including the Programmatic Restoration Plan) are incorporated by reference into this Final Supplemental Restoration Plan and are part of the Trustee Council's [administrative record](#)¹⁰ available online.

In addition, hard copies of the administrative record may be viewed by appointment at the location listed below:

Case Administrator for the Portland Harbor Natural Resource Trustee Council
Parametrix
700 NE Multnomah, Suite 1000
Portland, OR 97232

¹⁰ <https://www.diver.orr.noaa.gov/web/guest/portland-harbor-admin-record>

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2. STATUS OF THE PORTLAND HARBOR NATURAL RESOURCE DAMAGE ASSESSMENT AND RESTORATION PROCESS

2.1 Injury Assessment

The restoration alternatives discussed in this document arise from the ongoing phased Natural Resource Damage Assessment (NRDA) process (see Section 2.1.2) being conducted by the Trustee Council. The purpose of the NRDA process is to identify and quantify injuries caused by releases of hazardous substances and discharges of oil in the lower Willamette River and to identify and select appropriate restoration to address those injuries. This chapter summarizes the work conducted during the Trustee Council's Phase 2 assessment of ecological, recreational fishing, and tribal service losses. As discussed below, Phase 2 is an interim step in the NRDA process, not intended to serve as the Trustee Council's final determination of damages but to facilitate early settlements with willing PRPs.

2.1.1 The Natural Resource Damage Assessment Process

Pursuant to the federal CERCLA NRDA regulations (43 C.F.R. Part 11), a natural resource trustee can elect to perform a Type A or Type B injury assessment. Type A assessment procedures use simplified model assumptions to address injuries that result from a single event or short-term exposure. Releases of hazardous substances and discharges of oil from the PHAA have occurred from multiple sources over many decades, resulting in complex exposure conditions impacting aquatic and upland media and associated complex food webs. Therefore, the Trustee Council deemed that a Type A assessment would not be appropriate for the Portland Harbor NRDA. Instead, the Trustee Council elected to perform a Type B assessment, the procedures for which require "more extensive field observation than the Type A procedures" 43 C.F.R. § 11.33(b). This assessment method includes injury determination, quantification, and damage determination. Because substantial site-specific data already existed to support the assessment, the Trustee Council determined that a Type B assessment could be conducted for the PHAA at a reasonable cost.

Federal regulations provide a framework for performing a NRDA involving hazardous substances and describe methods for (1) making the decision to conduct an assessment, (2) establishing that hazardous substances have injured natural resources, (3) quantifying the extent of injury and resultant public losses, (4) determining the amount and cost of restoration required to return the injured resources and their services to baseline and to compensate the public for interim losses, and (5) planning and implementing projects designed to restore the injured natural resources and resultant public losses. Although the regulations are not mandatory, they provide useful guidelines for assessing injuries and damages and planning and implementing restoration of the injured natural resources and resultant public losses. The Trustee Council has been, and will continue to be, guided by these regulations as they carry out the Portland Harbor NRDA.

The NRDA process begins with a Preassessment Screen (PAS), in which a rapid review of readily accessible information allows for an early decision about whether to perform a damage assessment. Proceeding with an NRDA process, based on the results of the PAS, leads to the assessment phase. Finally, the post-assessment requires restoration of natural resources.

2.1.2 Phased Approach to Natural Resource Damage Assessment and Restoration

The Trustee Council took the first step in the formal NRDA process in January 2007 with the issuance of a PAS for the PHAA (PHNRTC 2007). In the PAS, the Trustee Council concluded that the criteria had been met to justify conducting a full NRDA process. The Trustee Council issued its public notice of intent to conduct an assessment of injury and damages in January 2008 and subsequently developed an Assessment Plan in June 2010 to guide implementation of the assessment.

To encourage cooperation with PRPs during the NRDA process, the Trustee Council is following an iterative, phased approach. Each phase builds upon preceding phases. Reasonable assumptions and estimates that protect the public interest may be used to fill data gaps without the need for extensive additional data collection, studies, and/or analyses, particularly in Phase 2.

Phase 1 – Development of the Assessment Plan. This phase of the Portland Harbor NRDA process included:

- Development of the Assessment Plan for completing the NRDA as described in the federal regulations.
- Early scientific studies to fill data gaps related to salmon, lamprey, and osprey.
- Development of a public outreach plan for the Portland Harbor NRDA process.
- Development of planning documents to help guide the NRDA process and development of a strategy for resolving liability of cooperating PRPs.
- A review of existing PHAA data collected as part of the remedial process, as well as other relevant data and literature to determine injury or damages and to evaluate data gaps.
- Development of an outline for the scope of Phase 2.

Phase 2 – Implementation of the Assessment Plan. The Trustee Council is conducting Phase 2 as an intermediate step not required by, but consistent with, the CERCLA NRDA regulations. It relies upon existing information and guidance in the federal regulations, with the goal of arriving at realistic early settlements with cooperating PRPs. This settlement-oriented assessment includes a natural resource damage-specific allocation to enable the Trustee Council and individual PRPs to settle their natural resource damages liability before the Trustee Council completes additional NRDA studies. The Trustee Council is currently engaged in the latter stages of Phase 2.

Phase 3 – Completion of the NRDA. Phase 3, which has already begun, will fill remaining data gaps, as needed, to complete injury determination and quantification, damage determination, and restoration planning sufficiently for the Trustee Council to further develop natural resource damage claims against PRPs who have not settled during Phase 2.

Phase 4 – Recovery of damages from non-settling PRPs. The purpose of Phase 4 is to recover from non-settling Portland Harbor PRPs natural resource damages resulting from the releases of hazardous substances and discharges of oil at Portland Harbor, including the cost of assessment. This stage may include litigation.

2.1.3 Potential Sources of Hazardous Substance Releases

Contamination in the PHAA reflects the historical industrial, marine, commercial, defense, and municipal practices for over 100 years in this active industrial, urban, and trade corridor. Contaminants from many facilities have entered the river system from different activities including, but not limited to, ship building, repair, and dismantling; wood treatment and lumber milling; storage of bulk fuels; manufactured gas production; chemical manufacturing and storage; metal recycling, production, and fabrication; steel mills, smelters, and foundries; and electricity production and distribution. These activities have resulted in direct discharges from upland areas through stormwater and wastewater outfalls; releases and spills from commercial operations occurring over the water; municipal combined sewer overflows; and indirect discharges through overland flow, bank erosion, groundwater, and other nonpoint sources. In addition, contaminants from off-site sources have reached the PHAA through surface water runoff, sediment transport from upstream sources, and through atmospheric deposition (EPA 2016).

Operations that continue today along the riverbanks include bulk fuel storage, barge building, ship repair, automobile scrapping, recycling, steel manufacturing, cement manufacturing, transformer reconditioning, operation, and repair of electrical transformers (including electrical substations), and many smaller industrial operations. Contaminants continue to reach the river through erosion of contaminated soils and riverbanks and through groundwater and surface water discharges. Upstream sources within the broader Willamette River Basin contribute to contamination in sediment, surface water, and biota at the PHAA. EPA conducted an extensive search for PRPs and, to date, has identified about 150 parties as potentially responsible for releasing contaminants to the river. Releases of hazardous substances and discharges of oil, as described above, have resulted in contamination of river sediments, suspended sediments, groundwater, surface water, biota, and riverbank soils (EPA 2016).

2.1.4 Portland Harbor Phase 2 NRDA and Restoration Process

As discussed above, Phase 2 relies upon existing information and guidance in the federal regulations, with the goal of arriving at equitable early settlements with cooperating PRPs. The work conducted under the Phase 2 Assessment Plan was envisioned to include the following elements:

- Focus the assessment in the Phase 2 PHAA (see Figure 1).
- Use a combination of habitat equivalency analysis (HEA), resource equivalency analysis (REA), and benefit transfer (BT) to quantify ecological and recreational losses. Rely on existing information to the extent practicable and employ reasonable and conservative assumptions to evaluate exposure of natural resources to hazardous substances within the PHAA and quantify corresponding injuries. Some additional data may be collected collaboratively with PRPs participating in the assessment, or independently by the Trustee Council, to quantify injury, as warranted.
- Assess key resources including juvenile salmon, juvenile lamprey, sturgeon, sediment, benthos, piscivorous birds (i.e., osprey and bald eagle), piscivorous mammals (i.e., otter and mink), other natural resources with tribal value, and other fish covered by advisories or having recreational value.
- Continue a lamprey study started in Phase 1.

- Select restoration projects for use in the Phase 2 settlement process and, potentially, later Phases, as reflected in this document.
- Develop or evaluate a natural resource damages liability allocation method.

As part of Phase 2, the Trustee Council quantified or qualitatively characterized natural resource injuries and lost services using methods typically applied in the context of an NRDA, and it identified the type, scale, and cost of restoration sufficient to compensate the public for these losses. Efforts were undertaken pursuant to a cooperative NRDA process with the goal of achieving timely habitat restoration projects and resolving natural resource damage liability through settlements with as many PRPs as possible. The Trustee Council notes, however, that the use of HEA, REA, and BT described in this section, as well as the equitable allocations made to assign damages to individual PRPs, were only intended to facilitate these early settlements. Assessment activities conducted in Phase 3 and beyond will likely rely on different tools and techniques and may result in a more refined set of conclusions with respect to both injury and restoration.

2.1.5 Ecological Losses, Methods and Results

Natural resources provide many services, including ecological services such as the provision of food and habitat for fish and wildlife, as well as processes such as nutrient cycling (Strange et al. 2002). The objective of restoration in the NRDA process is to restore, replace, or acquire the equivalent of the injured resources and the services they provide. The Trustee Council can use a variety of methods to determine the appropriate amount of restoration.

To calculate contaminant-related ecological losses for the purposes of Phase 2, the Trustee Council used HEA, a method commonly applied in the NRDA process and an accepted damages valuation methodology under 43 C.F.R. Part 11. The premise of HEA is that the public can be compensated for past and expected future losses in ecological services through the provision of additional ecological services in the future. Therefore, HEA quantifies ecological functions lost due to contamination (in terms of ecological services provided by an area of habitat), and it informs how much restoration is required to generate an equivalent amount of similar services.

Because environmental losses and gains are not experienced at a single point in time, HEA accounts for changes in contaminant concentrations over time (e.g., resulting from remedy or natural recovery), as well as the social discount rate (i.e., change in value the public holds for a good or service over time). The public typically holds a greater value for services in the past and a lesser value for those same services in the future (Freeman 1993). This reflects that the public typically would rather have a good/service provided today instead of tomorrow. In the NRDA process, a discount rate of 3 percent is applied (NOAA 1999). To compare losses and gains that occur over different time periods, the present value (i.e., value in a single common year) of services is calculated. That is, past losses are compounded annually at 3 percent and future losses (and gains from future restoration) are discounted annually at 3 percent. Losses and gains are then expressed in terms of present value units of the diminished resource itself—discounted service acre-years (DSAYs)—rather than economic value (Unsworth and Bishop 1994). Dollar damages are calculated as the cost of compensatory restoration projects.

The Portland Harbor Phase 2 HEA relies on relationships between sediment contaminant concentrations and estimated losses in ecological services. Services are “the physical and biological functions performed by the resource including the human uses of those functions” (43 C.F.R. § 11.14 (nn)). A reduction in the ability of a resource to provide these services, as compared to the baseline level of services

(Section 2.1.5.2), is considered a service loss. The basis for this type of model is that ecological services provided by habitat are lost when organisms that use that habitat are adversely affected by the presence of contamination. Adverse effects of increasing severity and on increasing numbers of species represent increasing degrees of service loss. The Trustee Council determined that concentrations of a suite of contaminants in Portland Harbor resources are sufficient to cause injury to trust resources (PHNRTC 2007).

In developing the Portland Harbor Phase 2 HEA, the Trustee Council elected to focus its assessment on a suite of several contaminants that had been detected in Portland Harbor sediment. To select an appropriate set of contaminants, the Trustee Council reviewed the available data from the lower Willamette River in the NOAA Query Manager database, Version 101208. The Trustee Council selected a subset of contaminants that:

- Represented classes of contaminants of concern identified in the draft Portland Harbor Remedial Investigation Report (LWG 2009).
- Had a sufficient number of samples for interpolation throughout the geographic scope of the assessment area.
- Were identified as risk drivers in the draft Ecological Risk Assessment for Portland Harbor (LWG 2009).
- Had detected results that exceeded service loss benchmarks in the Hylebos Waterway HEA model (Wolotira 2002), discussed below, and comprised the majority of the Hylebos model data (i.e., included only a minimal amount of “non-detects” [samples with contaminant concentrations known only to be below the analytical method’s detection limit]).

The main categories of contaminants released to Portland Harbor include PAHs; PCBs; DDT, dichloro-diphenyl-dichloroethylene (DDE) and dichloro-diphenyl-dichloroethane (DDD); metals; organotins; benzene, toluene, ethylbenzene, and xylene (BTEX); solvents; phthalates; phenols; methyl tertiary-butyl ether (MTBE); chlorobenzenes; and dioxins/furans (Stratus Consulting 2010). After review of available data, the Trustee Council identified 12 contaminants, or substances of concern (SOCs), that satisfied all four criteria described above. The NRDA was subsequently focused on these for settlement purposes:

- PAHs, total
- PCBs, total
- DDT
- DDE
- DDD
- Tributyltin (TBT)
- Bis (2-ethylhexyl) phthalate
- Cadmium
- Copper
- Lead
- Mercury
- 4-Methylphenol

To identify relationships between detected levels of these contaminants in Portland Harbor sediment and ecological service losses, the Trustee Council relied primarily on service loss thresholds from the Hylebos Waterway HEA model, with limited updates to account for more recent information (Wolotira 2002). The Hylebos model is premised on the assumption that sediment contamination levels high enough to cause adverse effects to species result in losses of ecological service.

Based on a review of scientific literature, technical data, applicable regulatory standards, and the results of studies relied upon by the natural resource trustees involved with the Hylebos Waterway NRDA, the Hylebos model identified concentrations above which hazardous substances have effects on key species or species groups. The Hylebos model considered adverse effects ranging from subcellular alterations to mortality. As concentrations increase, the contaminants cause more severe effects on more species. Based on these data, the trustees for the Hylebos Waterway developed relationships between increasing concentrations and increasing levels of service loss. Most of these relationships were based on data on benthic invertebrates; however, the service loss estimates for PCBs and PAHs also included data on salmonids and flatfish, respectively.

For the Portland Harbor NRDA process, the Trustee Council quantified injuries in the PHAA based on lost resource services to establish a basis for scaling restoration and determining damages. Because evaluating lost services for every natural resource that uses PHAA habitat is not reasonable, the Trustee Council identified sediment to be representative of the aquatic habitat. The essential functions of sediment (e.g., habitat at the base of the food web, critical role in nutrient and energy cycling) and the breadth of available contaminant concentration and effects data for sediment led the Trustee Council to conclude that sediment is an appropriate proxy for quantifying overall lost habitat services.

2.1.5.1 Service Losses

Ecological service losses were calculated by comparing surface sediment chemistry concentrations for the 12 SOCs to literature-based thresholds that inform the severity and magnitude of adverse effects (e.g., to benthic invertebrates, fish) based on a range of contaminant concentrations. Consistent with injury definitions in the CERCLA NRDA regulations, endpoints include, but are not limited to, changes in biochemistry, reproduction, growth, and/or survival (43 C.F.R. § 11.62). In general, adverse effects and corresponding ecological service losses increase with increasing contaminant concentrations (expressed as a percentage of services lost). For this assessment, the Trustee Council primarily used service loss relationships developed for the Commencement Bay Superfund Site in Puget Sound, Washington (Wolotira 2002). Service loss thresholds for total PAHs were modified based on an additional evaluation of the literature and site-specific information.

2.1.5.2 Baseline

In order to quantify injuries, and therefore scale restoration activities and calculate damages, the baseline condition (i.e., physical, chemical, and biological condition) of the affected resources and associated services must be established. Baseline is “the condition or conditions that would have existed at the assessment area had the...release of the hazardous substance...not occurred” (43 C.F.R. § 11.14 (e)). Degradation caused by permitted releases of hazardous substances or physical modifications of habitat is not compensable under CERCLA (43 C.F.R. § 11.24 (b)). For the purpose of evaluating injury from contamination, baseline habitat condition within the assessment area is based on the services various habitat types provide absent contamination. For example, deepwater navigation channels or nearshore habitats covered by overwater structures provide a relatively low level of ecological services.

Thus, such habitats are assigned low ecological service values to reflect degradations to baseline not associated with contamination.

Baseline contaminant levels—that is, contaminant levels that would have existed but for the releases from the PRPs—are accounted for both in the HEA and in the process of allocation of liability for purposes of settlement. For example, baseline contamination from non-PRP upstream sources and non-site-specific sources and any corresponding losses in ecological services are identified as such in the allocation process and are not allocated to a specific PRP.

To account for non-contaminant baseline conditions within the PHAA, the Trustee Council used a habitat value rating to describe the level of habitat services provided by a one-acre area. The Trustee Council developed and adopted habitat value ratings that rank the relative importance of habitat types in the lower Willamette River for juvenile Chinook salmon using technical information received from a group of government and academic scientists knowledgeable about juvenile salmon and juvenile salmon habitat. The Trustee Council identified salmon as an appropriate species to represent habitat quality for the following reasons: (1) based on existing information, it is likely that injury to salmon in the PHAA has occurred; (2) the habitat preferences and needs of salmon are similar to or overlap with those of other potentially injured resources in the PHAA; (3) upper Willamette River Chinook salmon are listed as threatened under the Federal Endangered Species Act (ESA), 16 U.S.C. § 1531, *et seq.*; and (4) Chinook salmon critical habitat is located within the PHAA.

Habitat values were assigned on a scale of 0.00 to 1.00, with 1.00 being the highest quality habitat for juvenile Chinook salmon. For example, a value of 1.00 is provided by a gently sloped, naturally vegetated, active channel margin or a shallow, off-channel area with gravel substrate. In contrast, areas of substrate beneath overwater, human-made structures are assigned a low habitat value for juvenile Chinook salmon.

Injury caused by contamination is quantified as a portion of the baseline habitat service value. Numerous habitat types were identified in the PHAA, and each was assigned a value that was subsequently used in the assessment of ecological service losses for the PHAA.

2.1.5.3 Finalizing the Phase 2 Assessment and Developing Claims

With the completion of the Phase 2 HEA, the Trustee Council's remaining task is to apply the HEA results to specific physical locations, and, thereby, specific PRPs. This is accomplished through a multi-step process that begins with the generation of "contamination footprints." For each of the contaminants included in the HEA, the Trustee Council uses concentration data to define areas in which a service loss had occurred. Each of these areas is considered a footprint. The Trustee Council evaluates the data within each contaminant footprint and assigns a corresponding level of service loss. Combining the acreage of each contaminant footprint with the corresponding service loss over the timeframe of the analysis yields the number of DSAYs associated with each footprint.

Finally, the Trustee Council assigns each contaminant footprint to one or more facilities. Where a footprint is associated with more than one facility and/or PRP, the Trustee Council divides the DSAYs between PRPs based on a thorough review of each facility's site history. Ultimately, the output of this process is a DSAY total for each PRP that released SOCs into the assessment area. In turn, the DSAY total serves as the metric used to determine the PRP's liability, that is, if a PRP's facility generated a certain number of injury DSAYs, that PRP is then responsible for conducting or funding ecological restoration generating the same number of DSAYs worth of ecological benefit.

As discussed in detail in Section 3.1, the Trustee Council proposes to use restoration bank credits to restore the injured resources and resolve the liability of settling PRPs. Since restoration banks generally quantify their benefits in terms of DSAYs, this would create a simple settlement transaction: a PRP, or funds paid by a PRP, would buy a DSAY of restoration to compensate for each DSAY of injury caused by its activities or facilities.

As noted above, this Phase 2 assessment is intended as an expedited process to address the liability of those PRPs interested in early settlement. The Trustee Council may revisit in Phase 3 and beyond any scientific conclusions reached in Phase 2.

2.1.6 Recreational Fishing and Boating Losses, Methods and Results

A PCB-related fish consumption advisory was issued in 2004 and updated in 2018 for resident species and sturgeon caught in the PHAA. In concert with this advisory, Portland Harbor contamination has affected perceptions about the quality of the fishery and boating opportunities for the past several decades, resulting in a loss of recreation services that would have been provided by Portland Harbor natural resources but for the contamination.

Recreation services (i.e., uses and associated values) have been affected in two ways:

1. People may continue to recreate at the contaminated site but enjoy it less (Reduced Quality/Affected Trips).
2. People may choose to forego certain types of recreational activities altogether, or may choose to change the location or types of recreational trips in which they still participate (Substituted Trips).

This section summarizes the methods and results for the recreation damages portion of the Phase 2 NRDA. This document does not address restoration actions for lost recreational uses, which will be the subject of a future restoration planning effort. However, the Trustee Council provides the following summary of the lost recreational use assessment for the sake of completeness.

For purposes of Phase 2 and early settlements, the Trustee Council used the BT method to estimate recreation damages. BT is an accepted methodology under 43 C.F.R. Part 11 and government agency guidelines for economic analyses (OMB 2003; EPA 2010). In this case, BT is characterized by the application of literature-based values that reflect the extent of lost and reduced-quality use at comparative sites to site-specific changes in recreational behavior/perception (e.g., with versus without contamination). Recreation damages were estimated for four types of recreational activities: (1) resident species fishing, (2) sturgeon fishing, (3) anadromous species fishing (including salmon and excluding sturgeon), and (4) boating. Other recreation uses (e.g., non-motorized boating, wildlife viewing, hiking) potentially impacted by Portland Harbor contamination were considered but not quantified, primarily because existing data for those activities are limited.

Up to two additive damage calculations were made for each recreational use category: one for trips that occur with reduced quality (affected trips, item 1, above) and another for trips that are taken elsewhere or not at all (lost or substituted trips, item 2, above). Based on the available economics literature and information collected by the Trustee Council in September 2011 from focus groups with regional anglers and boaters, the affected trips calculation was carried out for all four recreation categories, while the lost trips calculation was only carried out for the resident species and sturgeon fishing categories. Recreation damages associated with reduced quality and lost trips were calculated annually from 1981 (in accordance with the promulgation of CERCLA and the divisibility of damages associated with recreational service losses), to the time when impacts to the specific recreation trip category were

expected to end. Damages for a given year were calculated by multiplying the following inputs: (1) annual recreation trips, (2) percentage of total trips affected, (3) percentage of total trips lost, (4) annual total potential loss factor, (5) estimate of per-trip lost value or per-trip value, and (6) annual discount rate. The Trustee Council used these inputs to calculate damages associated with reduced-quality and lost trips for each recreation category (recall, damages associated with lost trips were only estimated for the resident species and sturgeon fishing categories).

It is more challenging to allocate lost recreational use by PRP in the PHAA than it is ecological injury. This is due to Portland Harbor's complex contaminant profile and the fact that it would be difficult to identify which specific contaminants and/or footprints are responsible for a given lost trip or a specific reduction in enjoyment. Therefore, for purposes of Phase 2 settlements, the Trustee Council anticipates assigning lost recreational use damages based on the allocation of DSAYs for ecological injury. For this allocation, each DSAY would be assigned a proportional amount of the lost recreational use damages. This acknowledges that a PRP's liability for lost recreational use should be roughly commensurate with the amount of ecological injury that PRP has caused.

2.1.7 Tribal Losses

As described above, the Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of Siletz Indians, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, and the Nez Perce Tribe (together, Tribes) are members of the Trustee Council. Releases of contaminants in and adjacent to the PHAA have injured natural resources of tribal importance, resulting in the lost use of those resources. In an effort to identify tribal-specific losses due to contamination, the Tribes conducted interviews with tribal members and natural resources staff to evaluate (1) species of primary importance to the Tribes, and (2) whether compensatory restoration actions, above and beyond the ecological and recreational restoration efforts, were necessary to address tribe-specific lost use.

Fish species in the lower Willamette River of primary importance to the Tribes for Portland Harbor NRDA purposes are salmon, sturgeon, and lamprey. Tribal representatives conducted focus group interviews with tribal members and staff between November 2010 and May 2012. These interviews focused on the impact of contamination on tribal salmon and sturgeon fishing and lamprey gathering in the Portland Harbor area. Results were similar across Tribes, and indicated that tribal members experience some level of loss associated with salmon, sturgeon, and lamprey contamination.

2.1.7.1 Salmon and Sturgeon

Regarding salmon and sturgeon, some tribal members avoid eating salmon or sturgeon from the lower Willamette River and/or avoid fishing for these species due to contamination. In addition, many tribal members fish for these species in areas other than Portland Harbor for reasons that include lack of contamination.

In the context of assessing the ecological benefits of potential restoration actions, the Trustees developed specific criteria to identify benefits to salmon as a target fish species for habitat restoration with the understanding that other target species would also benefit from such restoration. For example, information indicates that both salmon and sturgeon would benefit from habitat characteristics such as in-stream habitat structures and improved water quality. This metric allows the Trustees to scale a restoration project (i.e., calculate sufficient project size and scope) to generate benefits for the

particular species of concern. Given these factors, the Tribes believe that general ecological restoration as a result of the NRDA will provide sufficient benefit to salmon and sturgeon to compensate for tribal losses associated with contamination of these species.

2.1.7.2 Lamprey

Unlike salmon and sturgeon, lamprey gathered at Willamette Falls, approximately 15 miles upstream from the PHAA, are a sole-source fishery for tribal members due to plummeting lamprey populations at other sites where tribal members also traditionally collected these fish. As part of their life cycle, lamprey migrate up the lower Willamette River and the PHAA en route to Willamette Falls, and are exposed to contamination during that journey. Due to this exposure, lamprey harvested at Willamette Falls do not provide the full suite of services they would provide absent the contamination. Specifically, due to the association of lamprey at Willamette Falls with contamination, tribal members either do not eat lamprey or do not enjoy their meals as much, and also are worried about lamprey meals they provide to others, including their children. This reduced quality results in a lost connection to and use of the lamprey resource. These losses have occurred in the past and will continue into the future until contamination in the PHAA, and its associated impact on tribal members' perception and consumption of lamprey, is removed.

Juvenile lamprey, referred to as ammocoetes, migrate through the lower Willamette River en route to the Pacific Ocean. On their outward migration, which can take from 3 to 7 years, ammocoetes burrow in sediments and filter feed at the sediment/water interface. Thus, ammocoetes potentially experience substantial and prolonged exposure to contaminated sediments. To evaluate this line of evidence of potential injury to lamprey, the Tribes, in cooperation with Oregon State University, conducted a pilot study (Stratus Consulting et al. 2013) assessing the toxicity of Portland Harbor sediment, as compared to relatively uncontaminated Siletz River sediment, to lamprey ammocoetes. Results of these preliminary experiments suggest that the presence of contaminants adversely affects ammocoete burrowing behavior. For example, ammocoetes exposed to contaminated sediment took longer to initiate and complete burrowing than ammocoetes exposed to reference/control sediment. This could have negative implications for ammocoetes in Portland Harbor, as burrowing is an essential behavior that allows ammocoetes to feed and gain protection from predators.

The Tribes conducted a literature review to assess whether the Trustee Council criteria that were developed to determine the relative benefit of habitat restoration projects for salmon were also relevant for lamprey. While some habitat characteristics may be used by both salmon and adult lamprey (e.g., shallow in-water habitat, in-stream habitat structures), the review indicated that data are insufficient to specifically identify lamprey habitat needs and preferences, particularly for ammocoetes, and that the benefits of restoration projects to lamprey are uncertain.

Therefore, tribal representatives developed a compensatory restoration claim for losses related to tribal use of lamprey in Portland Harbor. Based on the results of the pilot study, the literature review, and interviews with tribal members and staff, restoration actions focus on compilation and evaluation of existing data regarding risks to human health resulting from consumption of contaminated lamprey and monitoring of restoration efforts to assess ecological benefits to lamprey.

2.2 Restoration Planning

As described in Section 2.1, the Trustee Council developed a phased approach to the NRDA process for Portland Harbor. Using this approach, the Trustee Council has been conducting restoration planning

concurrent with damage assessment since 2008. Under NRDA, the goal of restoration is to return injured natural resources and services to the condition they would have been in if the contamination giving rise to the injuries had not occurred. By initiating restoration planning early, the Trustee Council sought to achieve on-the-ground improvements for injured natural resources and reach settlements with PRPs as quickly as possible for this large and complex site. As part of this early restoration planning work, the Trustee Council has provided technical assistance to PRPs and other project developers interested in implementing habitat restoration projects for use in future Portland Harbor NRDA settlements.

In the Programmatic Restoration Plan described in Section 1.1, the Trustee Council identified integrated habitat restoration as the overall restoration approach to guide restoration planning. Because there are several species that may have been injured by contamination in the PHAA (e.g., Pacific salmon, bald eagle, mink) the Trustee Council is proposing an approach to restoration that will provide benefits to all of the potentially injured species and help them recover. See Table 1 for a list of potentially injured natural resources in the PHAA. This integrated habitat restoration approach focuses on the habitat needs shared by these species, with a particular focus on juvenile Chinook salmon. The resulting integrated restoration will likely benefit other natural resources in Portland Harbor as well. To ensure that restoration is strongly linked to the injury and that it will benefit potentially injured species, the Programmatic Restoration Plan establishes a geographic boundary to guide the location of restoration projects (see Figure 1).¹¹

Table 1. Potentially Injured Natural Resources in the PHAA

Pacific salmon and steelhead	Double-crested cormorant	Spotted sandpiper
Pacific lamprey	Great blue heron	Mink
White sturgeon	Belted kingfisher	River otter
Bald eagle	Mergansers	Northern red-legged frog
Osprey	Cliff swallow	Pacific treefrog

2.2.1 Restoration Goals and Objectives

The Trustee Council’s overall goal is to restore, rehabilitate, replace, or acquire the equivalent of those natural resources potentially injured by releases of hazardous substances and discharges of oil in the PHAA. To accomplish this goal, the Trustee Council seeks integrated habitat restoration projects with a strong nexus to Portland Harbor’s injured resources that contribute to the following broad ecological objectives:

- Move toward normative hydrology
- Restore floodplain function

¹¹ In the Programmatic Restoration Plan, the Trustee Council concluded that all restoration should take place within the PHAA, river mile 0.8 to river mile 12.3, and the Broader Focus Area, the area outside of the PHAA that includes the mainstem Willamette River up to Willamette Falls, the Multnomah Channel, the Oregon side of the lower Columbia River between the east end of Hayden Island and the Multnomah Channel outlet, and portions of Scappoose Bay. The Trustee Council further concluded that no more than 50 percent of restoration should take place outside the PHAA.

- Reestablish floodplain and riparian plant communities
- Improve aquatic and riparian habitat conditions
- Improve river margin habitat (increase complexity)
- Restore habitat that provides ecological value in the landscape context (connectivity, patch size, shape, and distance between different patches of habitat)
- Restore recreational services in a manner that minimizes negative impacts to ecological restoration

The Trustee Council prefers restoration projects that enhance ecosystem processes, are integrated into the adjacent landscape, and are naturally sustainable to the greatest extent possible. The Trustee Council also supports projects that are spatially small, but that help restore key habitats in areas lacking key habitat types or features. Smaller projects in priority areas that are highly developed help to create a network of habitats that juvenile Chinook salmon and other species can use as refuge and corridors for migration.

In the Programmatic Restoration Plan, the Trustee Council also developed a list of priority habitat types for restoration. Based on their importance for potentially injured natural resources, these habitats are highest priority:

- Off-channel habitat
- Active channel margin
- Shallow-water habitat
- Beach habitat
- Riparian habitat
- Upland habitat

To help identify projects that achieve these goals and objectives and restore the key habitat types listed above, in 2012, the Trustee Council published a preliminary list of ecological restoration projects in the [Ecological Restoration Portfolio](#).¹² Projects included in the portfolio were identified through several sources, including community-led funding proposals and concepts submitted to various local programs; discussions with potential restoration partners, the Portland Harbor CAG, and the public; potential projects identified by the City of Portland for Water Resource Development Act funding (2005); and the Draft Willamette Greenway Plan/River Plan (2008).

Each of these projects was screened against criteria developed by the Trustee Council to address social constraints (feasibility), geographic considerations, rare and/or unique restoration opportunities, and ecological benefits. For the ecological benefit criterion, the Trustee Council identified salmon, lamprey, and sturgeon as the target fish species, and bald eagle, osprey, spotted sandpiper, and mink, as the target wildlife species. These species were selected because they represent species guilds common in Pacific Northwest river systems that share similar types of habitats, and/or because these species may have been injured by releases of hazardous substances and discharges of oil in the PHAA.

¹² https://www.fws.gov/portlandharbor/sites/default/files/documents/RestorationPort_AppA.pdf

Another important aspect of the Trustee Council’s Programmatic Restoration Plan is a list of preferred native plants for restoration (see Appendix C of the Programmatic Restoration Plan). The list was initially developed by the Tribes who created an inclusive list of plants native to the Willamette Valley with cultural significance to one or more of the Tribes. Further review of the list was conducted by other members of the Trustee Council to tailor the list to reflect other considerations important to restoration projects. Parties implementing restoration projects are required to carefully choose species from this list that are ecologically appropriate for the habitat being restored and are, thus, most likely to become established. Trustee Council staff then work with restoration implementers to develop a plant list well suited to each restoration project.

In the Programmatic Restoration Plan the Trustee Council also detailed plans for the monitoring and stewardship of restoration projects. Monitoring and maintenance will help ensure that NRDA restoration project sites are able to provide the required long-term benefits to any injured resources. By establishing performance criteria that relate to monitoring plans and adaptive management strategies, each restoration project is expected to have a well-documented framework that allows the Trustee Council to determine if project goals and objectives are met. By requiring long-term stewardship in perpetuity at each restoration project, the Trustee Council will ensure that each restoration project continues to benefit any injured resources long after the project has met its performance criteria, and that it will produce the full measure of ecological value needed to compensate for resource losses. Active monitoring and adaptive management activities are expected to last at least 10 years after project implementation. Long-term stewardship is expected to continue beyond 10 years in perpetuity (see Figure 2). In addition, the Trustee Council requires that projects will be protected through fee title transfers, conservation easements, deed restrictions, or other legal mechanisms to permanently prevent conversions of the sites to uses incompatible with the created ecological values.

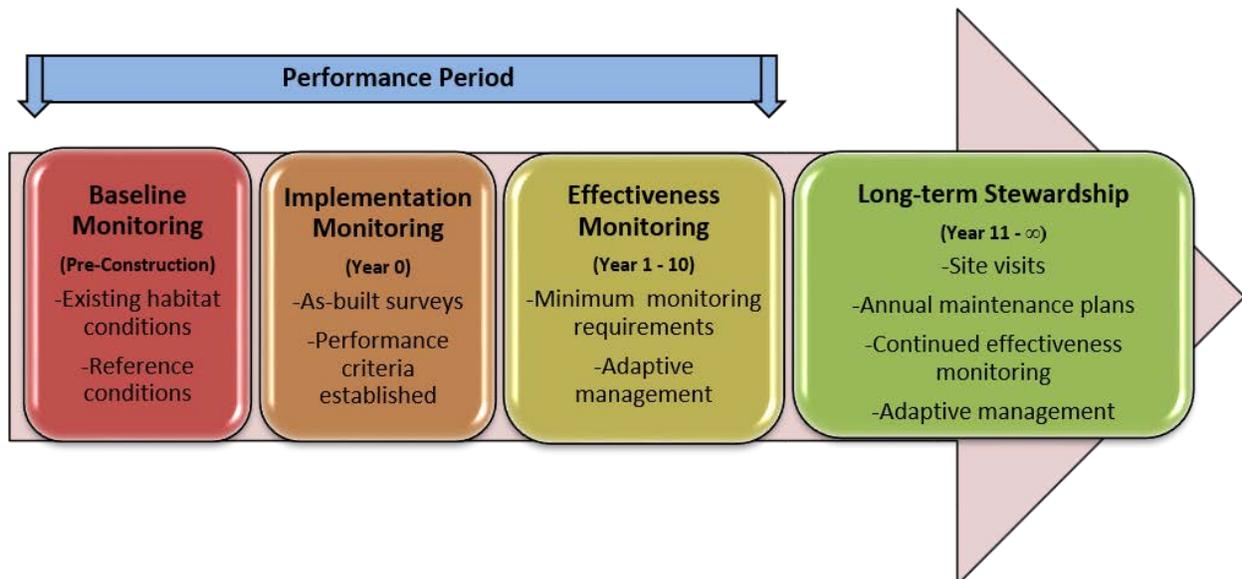


Figure 2. Portland Harbor NRDA Site Stewardship Model

2.2.2 Relationship between the Programmatic Restoration Plan and the Final Supplemental Restoration Plan

This Final Supplemental Restoration Plan picks up where the Programmatic Restoration Plan left off. The Programmatic Restoration Plan describes the preferred alternative for restoration in broad terms, but also lays out in detail a process by which the Trustee Council will select specific restoration alternatives and the criteria by which they will be evaluated. Using the programmatic approach, goals, objectives, and selection criteria identified in the Programmatic Restoration Plan, the Trustee Council is now ready to evaluate more specific options for an initial round of restoration implementation in anticipation of early settlements with PRPs.

In the Programmatic Restoration Plan, the Trustee Council describes several ways that a PRP can provide restoration to resolve its liability for damages at Portland Harbor, including PRP project implementation, PRP credit purchases from a restoration bank, or a PRP providing funds to the Trustee Council for restoration. In a settlement where the Trustee Council receives restoration funds from a PRP, the Trustee Council would then convert the settlement funds to restoration by one of three alternatives:

- Trustee-Led Project Alternative – The Trustee Council would use settlement funds to design and construct a restoration project.
- Partnering Project Alternative – The Trustee Council would provide settlement funds to a third-party entity to develop and implement a restoration project.
- Restoration Bank Credit Alternative – The Trustee Council would purchase ecological benefits, in the form of credits, from a restoration bank. For the purposes of this Final Supplemental Restoration Plan, the Restoration Bank Credit Alternative also covers the scenario listed above where a PRP proposes to resolve its liability by purchasing restoration bank credits.

In this Final Supplemental Restoration Plan, the Trustee Council proposes the Restoration Bank Credit Alternative as the Preferred Alternative that would best meet the goals and objectives identified in the Programmatic Restoration Plan at this time.

After completion of the Final Supplemental Restoration Plan, the Trustee Council anticipates using the Preferred Alternative as the basis for settlements with PRPs at the PHAA. This may be done in two ways: PRPs seeking to directly buy restoration credits may do so if their desired restoration is consistent with the Trustee Council's Preferred Alternative. Alternatively, PRPs who desire to pay money directly to the Trustee Council to conduct restoration may do so, allowing the Trustee Council to acquire restoration value consistent with the analysis in this document. In this Final Supplemental Restoration Plan the Trustee Council also includes a list of eligible restoration projects that fit the Preferred Alternative (see Chapter 3). Consistent with obligations under NEPA, the Trustee Council has evaluated the environmental impacts of the preferred and non-preferred alternatives in Chapter 5.

2.2.3 Project Scoping

In January 2020, the Trustee Council issued an RFP for ecological restoration projects representing any of the three alternatives described above within the PHAA and Broader Focus Area (see Figure 1) that would restore, or are in the process of restoring, key habitat types and benefit potentially injured natural resources. To develop the analysis in this Final Supplemental Restoration Plan, the Trustee Council's goal was to review specific projects representing each of these alternatives to better understand the benefits and challenges of each alternative. Proposed projects were required to meet all

of the eligibility criteria described in the RFP (see Appendix A). The Trustee Council then evaluated eligible proposals based on the selection criteria described in detail in the Programmatic Restoration Plan and outlined in the RFP. This evaluation is summarized in Chapter 3 of this document.

2.2.4 Future Restoration Planning Activities

The Trustee Council sought public comment during a 30-day comment period on the Preferred Alternative: Restoration Bank Credit Alternative. In this Final Supplemental Restoration Plan, the Trustee Council's responses to comments are included in Appendix C. The final Preferred Alternative remains unchanged and is the Restoration Bank Credit Alternative. Moving forward, the Trustee Council may (1) accept restoration credits purchased by PRPs directly from the restoration banks and/or (2) purchase restoration credits with settlement funds paid by PRPs to the Trustee Council. In the event the Trustee Council uses settlement funds to purchase credits, it will contact restoration bank implementers to receive detailed cost proposals at that time. After negotiations and successful acquisition of restoration value, the Trustee Council will provide public notice of the credit purchases.

This Final Supplemental Restoration Plan guides how the Trustee Council manages settlement compensation recovered through Phase 2 of the NRDA process for the PHAA. If additional settlements occur in the future, the Trustee Council may continue to rely on this Final Supplemental Restoration Plan, issue another request for project proposals, or consider other restoration alternatives. If and when the Trustee Council directly purchases credits from a particular restoration bank using settlement funds or accepts PRP-purchased restoration credits in settlement, public notice will be provided.

PRP project implementation is not evaluated in this document. If a PRP-implemented restoration project is proposed as part of a Phase 2 settlement, a separate planning effort and environmental impact analysis would be completed by the Trustee Council for that potential project. Opportunity for public comment would be provided.

In the Programmatic Restoration Plan, the Trustee Council also identified goals and objectives related to restoration of recreation and other human uses that may have been injured by long-term contamination in the PHAA. This Final Supplemental Restoration Plan is focused on the Trustee Council's decision-making and environmental impacts analysis associated with the restoration of ecological resources. The Trustee Council will identify a separate process to select appropriate restoration to compensate for recreational losses and will set aside a portion of recoveries to fund those actions. When this occurs, restoration planning and environmental analysis for recreational restoration will be conducted by the Trustee Council and shared with the public for review and comment.

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3. RESTORATION ALTERNATIVES AND EVALUATION PROCESS

To be considered viable in the Trustee Council’s analysis, an alternative must be reasonable and meet the Trustee Council’s purpose and need (see Section 1.4). Screening criteria were used to determine whether an alternative is reasonable. For purposes of evaluating alternative approaches to compensatory restoration in Portland Harbor, the Trustee Council, in the Programmatic Restoration Plan, identified the following as fundamental legal constraints applicable to any CERCLA or OPA restoration project. These factors serve as threshold criteria for evaluating each alternative’s ability to meet the purpose and need of this federal action under NEPA (NOAA 2005):

- Restoration actions must demonstrate a strong nexus to the injuries giving rise to the claim for natural resource damages.
- Restoration options chosen must be technically feasible and have a significant likelihood of success.
- Restoration actions must comply with applicable laws and regulations.¹³

As discussed above, in the Programmatic Restoration Plan, the Trustee Council applied these criteria and selected the preferred alternative of integrated habitat restoration, to be implemented through one or more of the following broad alternatives:

- Trustee-Led Project Alternative
- Partnering Project Alternative
- Restoration Bank Credit Alternative

At the time the Programmatic Restoration Plan was published, it would have been premature for the Trustee Council to evaluate specific actions under these three alternatives. Now, having received

¹³ The discussions regarding evaluation criteria here, and in the Programmatic Restoration Plan, are meant to reflect, in a case-specific way, the general project selection criteria outlined in the CERCLA NRDA regulations at 43 C.F.R. § 11.82(d):

- “(1) Technical feasibility, as that term is used in this part.
- (2) The relationship of the expected costs of the proposed actions to the expected benefits from the restoration, rehabilitation, replacement, and/or acquisition of equivalent resources.
- (3) Cost-effectiveness, as that term is used in this part.
- (4) The results of any actual or planned response actions.
- (5) Potential for additional injury resulting from the proposed actions, including long-term and indirect impacts, to the injured resources or other resources.
- (6) The natural recovery period determined in § 11.73(a)(1) of this part.
- (7) Ability of the resources to recover with or without alternative actions.
- (8) Potential effects of the action on human health and safety.
- (9) Consistency with relevant Federal, State, and tribal policies.
- (10) Compliance with applicable Federal, State, and tribal laws.”

proposals from the RFP, and with the prospect of potential early natural resource damages settlements in the near future, the Trustee Council entered this supplemental restoration planning process prepared to implement specific proposals.

The Trustee Council only received responses to the RFP in the category of restoration banks credits. Nevertheless, the Trustee Council must evaluate the specific proposals pursuant to the criteria established in the Programmatic Restoration Plan and the RFP. The Trustee Council undertook this analysis through a multi-stage review process.

First, the Trustee Council applied the eligibility criteria laid out in the RFP, which are largely a case-specific application of the general NRDA criteria listed at the beginning of this section. Restoration bank proposals that failed to meet these threshold criteria would not have been carried forward for further review. The criteria are described below.

1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Programmatic Restoration Plan.
2. The project must meet one or more of the Trustee Council's restoration goals, as stated in the Programmatic Restoration Plan:
 - Move toward normative hydrology
 - Restore floodplain function
 - Reestablish floodplain and riparian plant communities
 - Improve aquatic and riparian habitat conditions
 - Improve river margin habitat
 - Restore habitat that provides ecological value in the landscape perspective
3. The proposed project must be located within the PHAA or within the Broader Focus Area for restoration.
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of the RFP.
5. The proposed project's habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable to ensure that the Trustee Council is able to quantify the ecological benefit of all projects using a common metric.
6. The proposed project's physical footprint and its ecological benefits must ultimately have permanent legal protection.
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements, and the project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee Council's Monitoring and Stewardship Framework.
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.
9. Environmental credits used to resolve natural resource damages liability cannot be used for other purposes. Credits cannot be double-counted or be used to satisfy multiple legal obligations.

Second, the Trustee Council reviewed information related to a number of selection criteria laid out in the RFP, most of which were drawn directly from the Programmatic Restoration Plan. The full list of criteria is available in the RFP, but, to summarize, the Trustee Council sought information related to developer qualifications, project status, geographic location of the project, ecological benefits that were expected from the project, social constraints on the project, and any rare or unique restoration opportunities presented by the project.

Third, the Trustee Council aggregated the qualifying restoration bank proposals into the Trustee Council's Preferred Alternative: the Restoration Bank Credit Alternative. Note that the Trustee Council is not identifying specific credit purchases (i.e., how many and from which bank) in this plan. The Trustee Council will undertake this task after publication of the Final Supplemental Restoration Plan and report back to the public when specific credit purchases have been made or when the Trustee Council accepts PRP-purchased restoration bank credits in settlement. This permits the Trustee Council to determine credit purchases based on information at that time related to total settlement funds, credits available for purchase, and negotiated credit purchase prices.

3.1 Restoration Bank Credit Alternative (Preferred Alternative)

3.1.1 Restoration Banks

As a category, restoration banks are generally large-scale restoration projects developed with the intent of generating restoration credits, often for sale. A bank may be designed to provide credit for a single or multiple purposes, including NRDA restoration credit, ESA conservation credit, CWA mitigation credit, etc. The ability of a bank to serve both NRDA and other purposes could support larger restoration projects, resulting in more integrated and self-sustaining restoration.

Because they are not necessarily scaled to address just one PRP's liability, restoration banks can be larger projects that offer the benefit of reduced overall costs through economies of scale. The costs per acre of land acquisition, planning, permitting, equipment mobilization, monitoring, adaptive management, and stewardship decline with larger projects. Additionally, because restoration bank developers are required to provide financial and other assurances (described below) to help ensure that a restoration bank would provide the anticipated ecological benefits, the risk of project failure may be reduced, relative to other models of restoration implementation. Further, because the implementation of a restoration bank is not tied to the date of any specific settlement, these projects can often be implemented in advance of settlement, allowing for recovery of injured natural resources to begin earlier than if restoration were initiated after settlement.

3.1.2 Summary of Restoration Bank Responses to the RFP

The project information provided below and throughout the various analyses in this document is based primarily upon submissions from the restoration bank project developers. In order to treat all project submissions equitably, the Trustee Council relied on the developers' representations in deciding the threshold question of whether or not a project was qualified to be included in the Preferred Alternative. However, before recognizing any restoration credits as compensation in a NRDA settlement, the Trustee Council would independently verify that a given project has satisfactorily met all qualifications and has available qualifying credits.

The following sections summarize the restoration bank credit submissions received by the Trustee Council. The locations of the projects are shown in Figure 3.

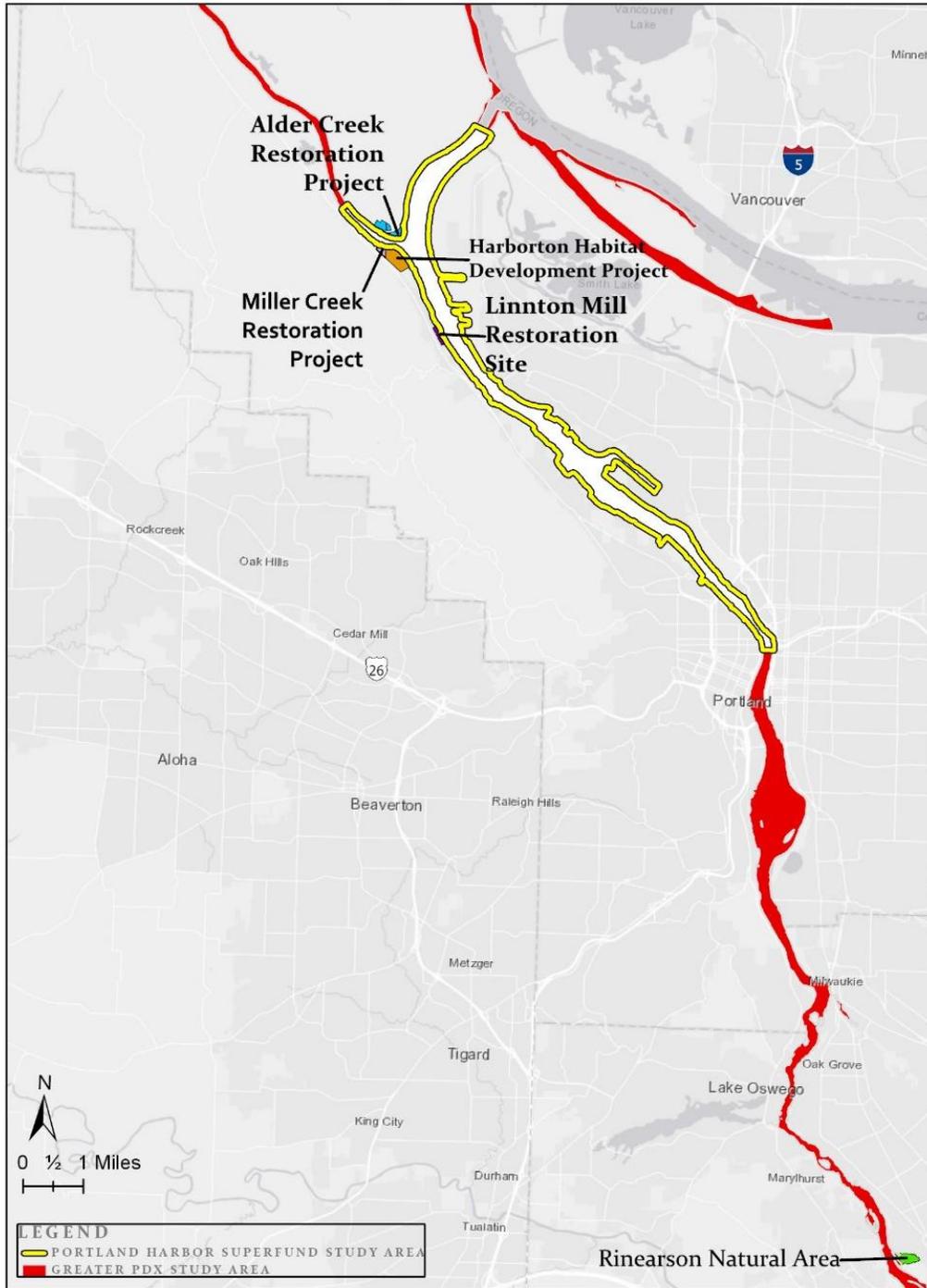


Figure 3. Potential Restoration Bank Projects

3.1.2.1 Project 1 – Alder Creek Restoration Project

The Alder Creek Restoration Project, implemented by Heron Pacific, LLC, doing business as Wildlands, owned by Portland Harbor Holdings II, LLC (PHH), restored and enhanced 52.3 acres to improve habitat for threatened and endangered salmon, steelhead, lamprey, as well as bald eagle, mink, osprey and other native fish of the lower Willamette River system. The project removed fill and other infrastructure to restore floodplain habitats that connect the Willamette River and the Multnomah Channel via side-channel habitat. The three side-channel connections are designed to maintain flow and permanent inundation that coincide with river levels. Through the Alder Creek Restoration Project, 470,000 cubic yards of material were removed; 69,000 native trees, shrubs, and marsh plants were installed; 48 pieces of large woody debris were installed; and elevations were altered to provide habitat complexity for side channels and marsh/mudflat habitat. The project, located on the southern tip of Sauvie Island, is at the divergence of Multnomah Channel and the Willamette River, and within the PHAA (near river mile 3). See Figure 3 for the project location and Figure 4 for habitat types restored by the Alder Creek Restoration Project.

The Alder Creek Project was constructed in 2014 and 2015 at the site of a former sawmill, and plantings occurred in 2015 and 2016. A conservation easement is planned for the site before the 10-year performance period ends, and currently a Declaration of Restrictions and Grant of Entry (i.e., deed restriction) is recorded with Multnomah County to only allow uses consistent with NRDA restoration objectives. This limits access to the project site and “no trespassing” signs alert the public that this is private property.

PHH and Wildlands have provided evidence of experience with numerous similar natural resource damage restoration sites, such as the Blue Heron Slough in Everett, Washington, and Hylebos Creek in Tacoma, Washington, along with Wildlands’ 29 years of experience with over 90 restoration projects. The project is in year 5 of its 10 years of planned effectiveness performance monitoring, which began in 2016. Ecological benefits have been accruing ever since 2014, when part of the site was reconnected to the Multnomah Channel along with the removal of 200,000 cubic yards of fill material.

This site is relatively large in size (52.3 acres) and is able to claim ecological benefits since 2014. Information about the site is available to the public on Wildlands’ website, and the project also has been presented at several public meetings. Project tours have been conducted for agencies, politicians, media, community members, and local government officials. Overall, the public has been supportive of this project. The site provides habitat for target salmonids and is adjacent to both the Willamette River and Multnomah Channel. The restoration allowed this portion of Sauvie Island to return to the mosaic of channels, marsh, and riparian habitat that historically existed throughout the lower Willamette River watershed.

The Alder Creek Restoration Project was included as a potential restoration site in the Trustee Council’s Ecological Restoration Portfolio in 2012 under the project name Alder Point. The Trustee Council provided technical assistance during the planning of this project and continues to provide oversight of its performance since implementation.

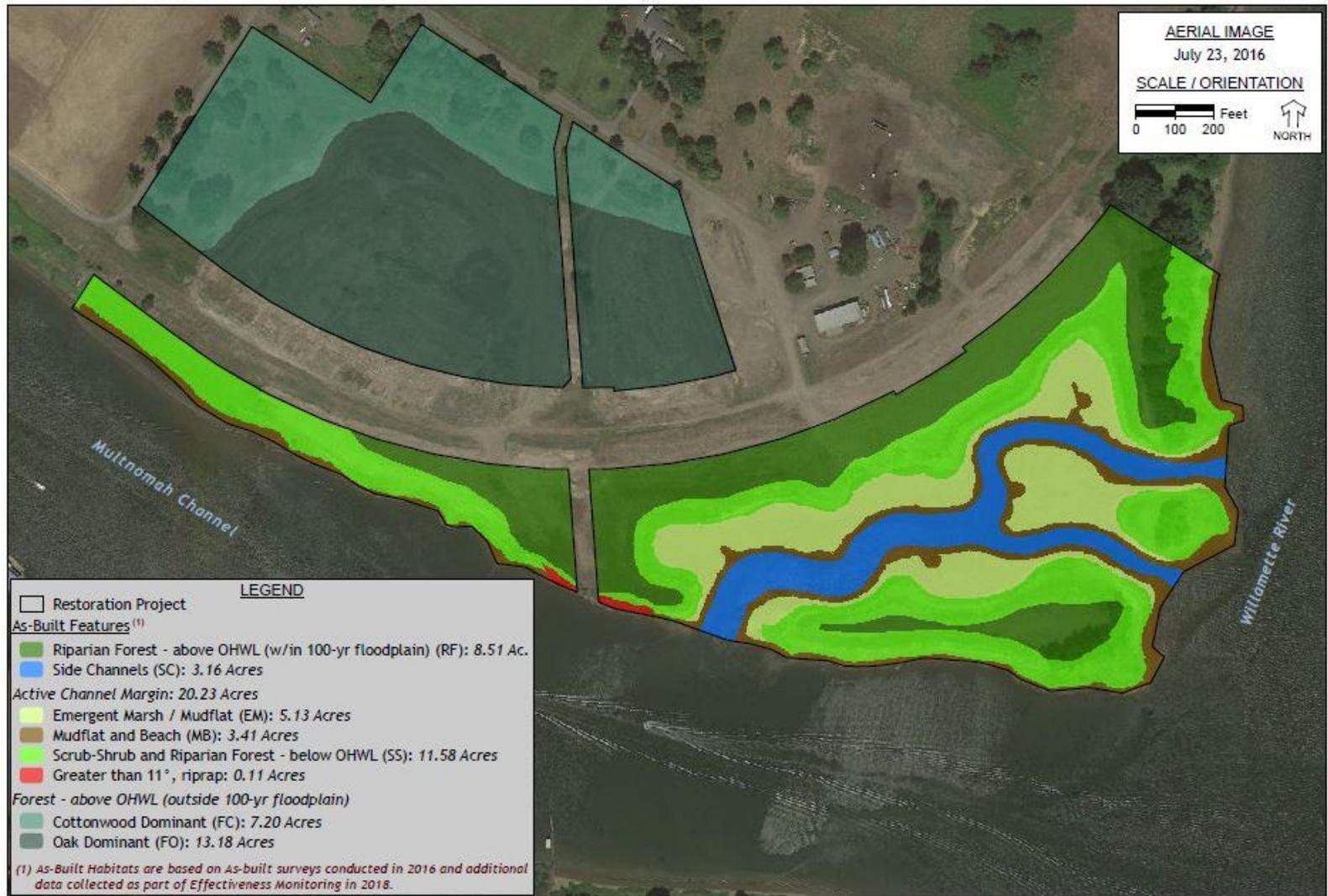


Figure 4. Habitat Types Restored by the Alder Creek Restoration Project

3.1.2.2 Project 2 – Harborton Habitat Development Project

As proposed, the Harborton Habitat Development Project developed by Portland General Electric (PGE) would restore tributary and off-channel habitat at the 74-acre Harborton Substation Property, with 54.66 of those acres becoming restored habitat. Restoration would excavate 162,000 cubic yards to create 28 acres of off-channel fish habitat for rearing and refuge from floodwaters, remove a barrier to restore fish passage to an existing channel, plant approximately 132,300 native plants, and install 410 pieces of large woody debris to provide in-channel habitat complexity. The project would create over 1,600 linear feet of new stream channel and provide access to 1,000 more feet through barrier removal. The Harborton site is located within the PHAA at river mile 3.3 of the Willamette River near the confluence with Multnomah Channel. See Figure 3 for the project location and Figure 5 for restoration planned for the Harborton Habitat Development Project.

Habitat construction began in 2020 and planting will continue in 2021. PGE identifies juvenile salmonids as the primary beneficiary of the targeted habitat restoration effort, due to the increased access to off-channel habitat for rearing and breeding. PGE proposes that a deed restriction would protect the restoration for the project's initial performance period, projected to cover the first 10 years of the project's existence after implementation. A conservation easement would be placed on the Harborton site before the end of the performance period to permanently protect conservation values. PGE owns the site. PGE has staff biologists with experience in survey methods and monitoring who have managed and monitored previous restoration projects. PGE also hired contractors who have completed similar projects at this scale and who have the resources to complete the Harborton project. The monitoring and adaptive management plan includes baseline, implementation, effectiveness, and long-term stewardship monitoring phases to assess hydrology, sediment, vegetation, water quality, fish, and wildlife at the site. Low levels of contamination were detected at the site, and PGE plans to address the contamination through further sampling and mitigation if necessary, understanding that there may be an associated loss of credits due to the impact to soils and potential exposure to ecological receptors.

The Harborton site is located where the Multnomah Channel diverges from the Willamette River, allowing for development of feeding and refugia habitat for out-migrating juvenile salmonids. The proposed size of the site is relatively large (54.66 restored acres), and it is located in an area zoned as industrial, but PGE proposes to permanently protect future habitat as described above. The Portland Harbor CAG and Linnton Neighborhood Association have received presentations on the project, and the public has had the opportunity to comment through multiple permitting processes. Restoring this site would help meet the goals for increased rearing and feeding habitat within the PHAA.

The Harborton Habitat Development Project was included as a potential restoration site in the Trustee Council's Ecological Restoration Portfolio in 2012 under the project name PGE. The Trustee Council is providing technical assistance during the planning of this project.

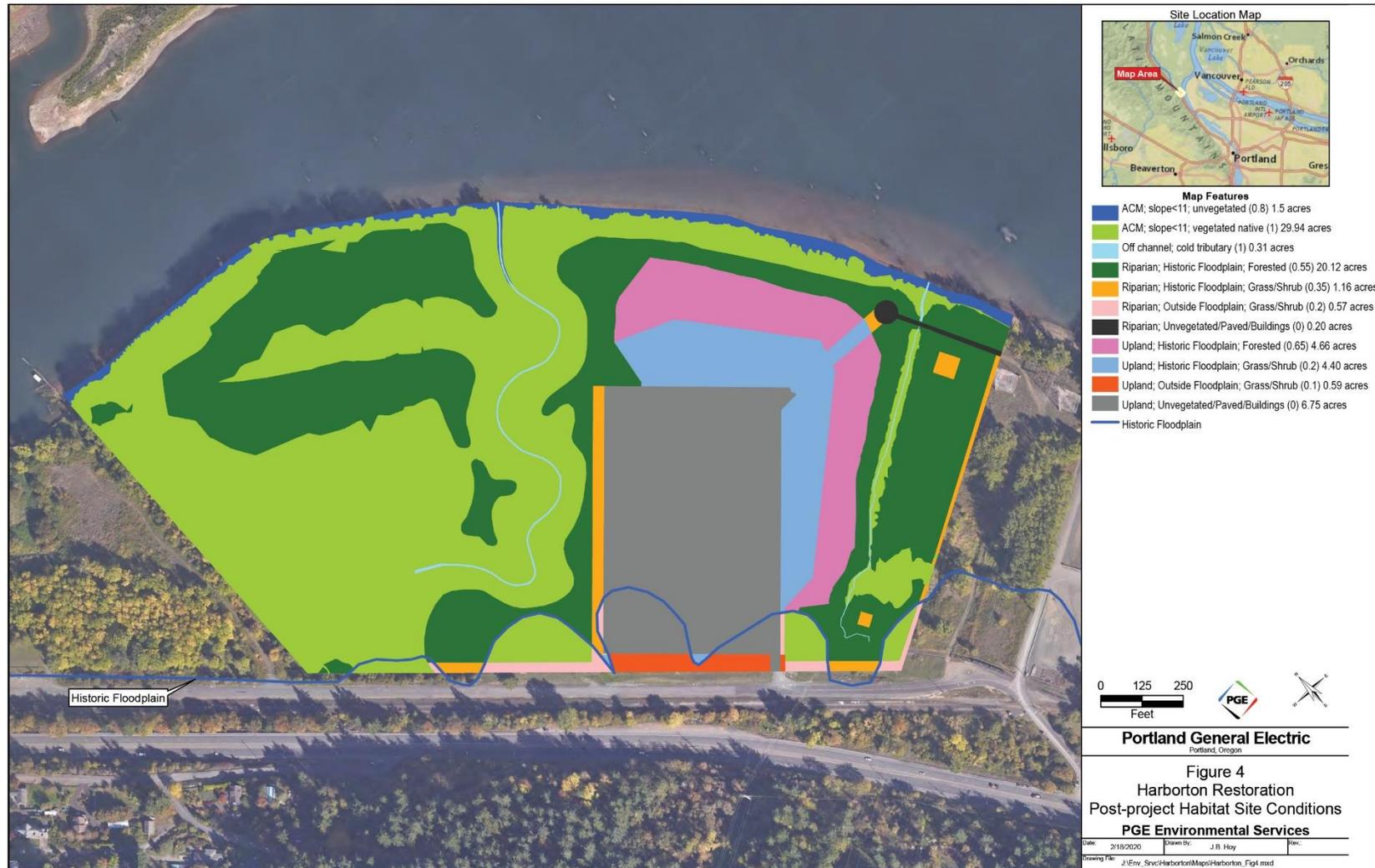


Figure 5. Proposed Restoration at the Harborton Habitat Development Project

3.1.2.3 Project 3 – Linnton Mill Restoration Site

The Linnton Mill Restoration Site, proposed for restoration by Linnton Water Credits, LLC (LWC), involved restoring 26.67 acres of an industrial site along the Willamette River into a landscape with restored riparian and upland habitat, new off-channel habitat, and enhanced shallow-water and active channel margin habitats. Restoration included removal of 2,000 piles and pile stubs. LWC restored natural floodplain hydrology and function at the site, planted over 70,000 native species, and provided aquatic habitat for target species to increase temperature refuge and provide off-channel habitat, both of which support juvenile Chinook salmon rearing. The Linnton Mill Restoration Site is within the PHAA (between river miles 4.7 and 5 on the Willamette River). See Figure 3 for the project location and Figure 6 for depiction of restoration implemented at the Linnton Mill Restoration Site.

LWC completed project construction in October 2019 and finished planting in February 2020. The project is already accruing ecological benefits. LWC has over 15 years of experience with NRDA credit banking, based on projects on the Duwamish River in Seattle.

The part of the project owned by the Oregon Department of State Lands (DSL) is subject to a DSL lease until the conservation easement replaces the lease. The 10-year DSL lease began April 8, 2019, and LWC has committed to replacing the lease with a DSL conservation easement. LWC owns the upland portion of the site above the ordinary low water line, which is subject to a deed restriction until a conservation easement deed replaces it before the end of the 10-year performance period. Fencing around the perimeter is installed to prevent people from entering the site. Long-term stewardship will include implementation and effectiveness monitoring to ensure the project was built as specified and that the habitat types and structural elements work as constructed.

Pre-construction baseline monitoring was conducted in 2014 and 2015, and in February 2020 post-construction monitoring was completed. Although the project could potentially be used for both NRDA credits and CWA mitigation credits, a system is in place to ensure there is no double counting of credits once they are used for either purpose. Based on surface soil analyses, low levels of contamination were detected at the site. LWC addressed the contamination through a combination of mitigation measures, including covering certain areas with clean sediment and accepting a loss of credits due to the impact to soils and potential exposure to ecological receptors. Conversations with DEQ and the Trustee Council will continue to ensure safety and success at the site. Additionally, a petroleum plume originating from a neighboring site was addressed in 2019 through removal of contaminated soil and debris and the addition of bio-remedial amendments. Long-term monitoring will continue to ensure safety.

The Linnton Mill Restoration Site presents the opportunity for creating beach habitat and improving the connection to clear, cold water from Forest Park streams. Community outreach since 2013 through presentations to organizations such as the Linnton Neighborhood Association and opportunity for public comment through permitting have helped to build public support for the project. The “daylighting” of piped streams restored floodplain function and habitat complexity at this site to encourage off-channel use by salmonids and lamprey. Shallow areas, beaches, and vegetated habitat are now available for numerous other target species due to restoration at the site.

The Linnton Mill Restoration Site was included as a potential restoration site in the Trustee Council’s Ecological Restoration Portfolio in 2012 under the project name Linnton Neighborhood. The Trustee Council provided technical assistance during the planning of this project and continues to provide oversight of the project’s performance.

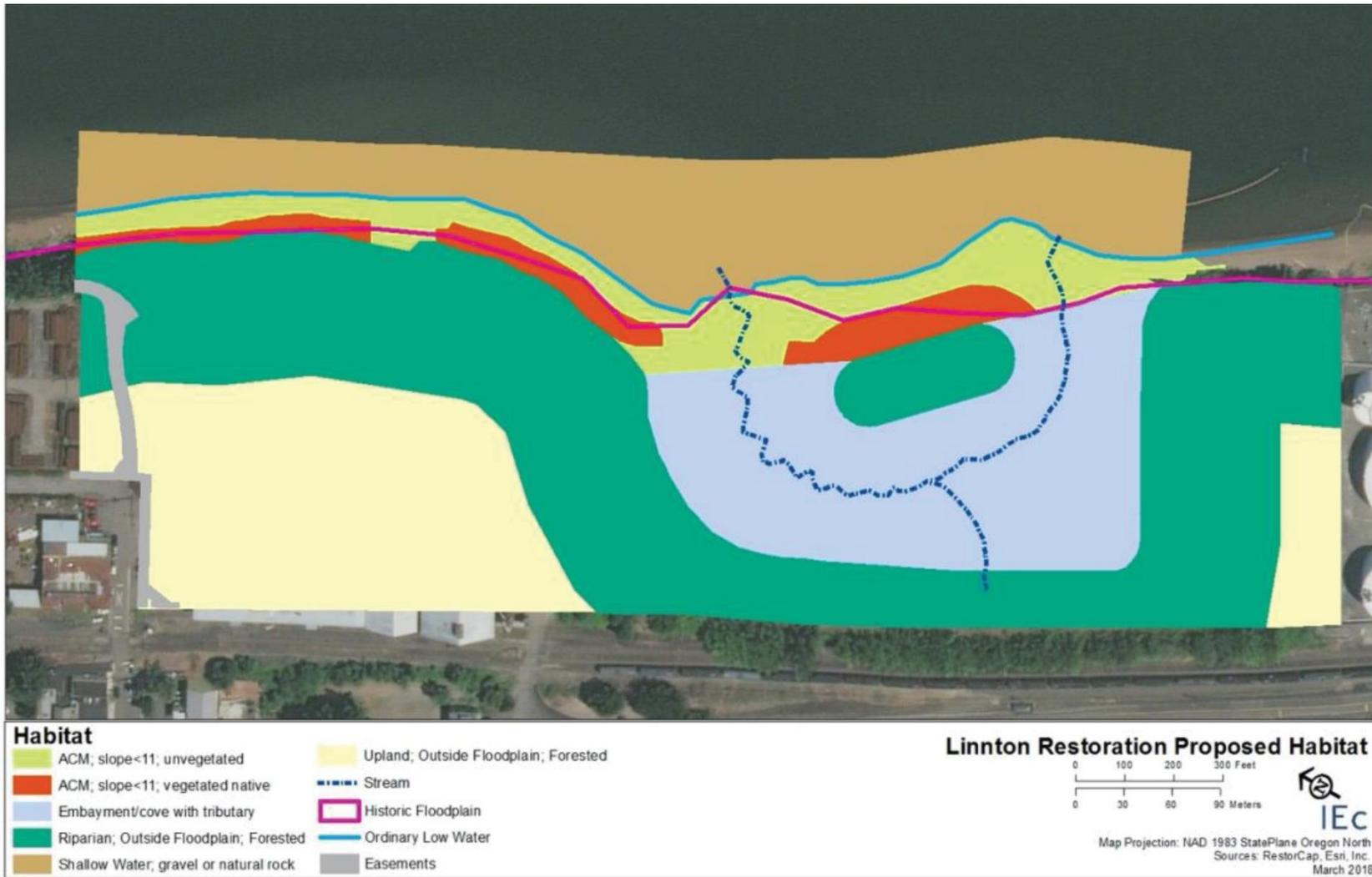


Figure 6. Restoration Proposed at the Linnton Mill Restoration Site

3.1.2.4 Project 4 – Miller Creek Restoration Project

The Miller Creek Restoration Project proposed by PHH and Wildlands is intended to enhance 13.17 acres of habitat for threatened and endangered species of salmon, steelhead, lamprey, eagle, osprey, and mink while providing additional benefits to native species throughout the lower Willamette River system. The project would reconnect Miller Creek to Multnomah Channel by restoring natural hydrology and floodplain function that had been altered by the placement of fill material. This material, including a parking area and road, would be excavated, and native riparian plants would be installed to create marsh habitat at the lower elevations within the historical floodplain and riparian forest habitat at higher elevations. Large woody debris would be installed to create habitat complexity within the floodplain and to control channel incision. The project falls within the northern reach of the PHAA. See Figure 3 for the project location and Figure 7 for a depiction of the restoration proposed for the Miller Creek Restoration Project.

In their RFP submission, PHH and Wildlands proposed that project implementation would begin within 2 years (by January 2022). Project planning has been in progress, and PHH began working with the Trustee Council to receive technical assistance through a memorandum of understanding in 2011. PHH has demonstrated the ability to successfully conduct similar projects through its similar work at Alder Creek, Blue Heron Slough, and Hylebos Creek, along with Wildlands' 29 years of experience with over 90 restoration projects. PHH plans to protect the 13.17 acres in perpetuity through a conservation easement with a third-party organization in the future. Currently, PHH owns the habitat development rights, and the property is owned by Frevach Land Company. Future access to the site would be prevented by locked metal gates and "no trespassing" signs, but once restored, small-craft boaters may passively use the area adjacent to the site. Before PHH obtained development rights to the site, the property was under threat of development.

This restoration bank presents an opportunity to provide coho salmon spawning habitat, and it is adjacent to Forest Park. Public outreach has occurred in the form of public meetings including public presentations to the Portland Harbor CAG and the Linnton Neighborhood Association, and a public comment period associated with fill removal at the site. Tours with agency personnel also were conducted. Ecological benefits include reconnection of a channel, removal of fill/dredge material, creation of complex riparian habitat, and enhanced habitat throughout the active channel margin.

The Miller Creek Restoration Project was included as a potential restoration site in the Trustee Council's Ecological Restoration Portfolio in 2012 under the project name Miller Creek Confluence. The Trustee Council previously provided technical assistance to early stages of planning for this project.

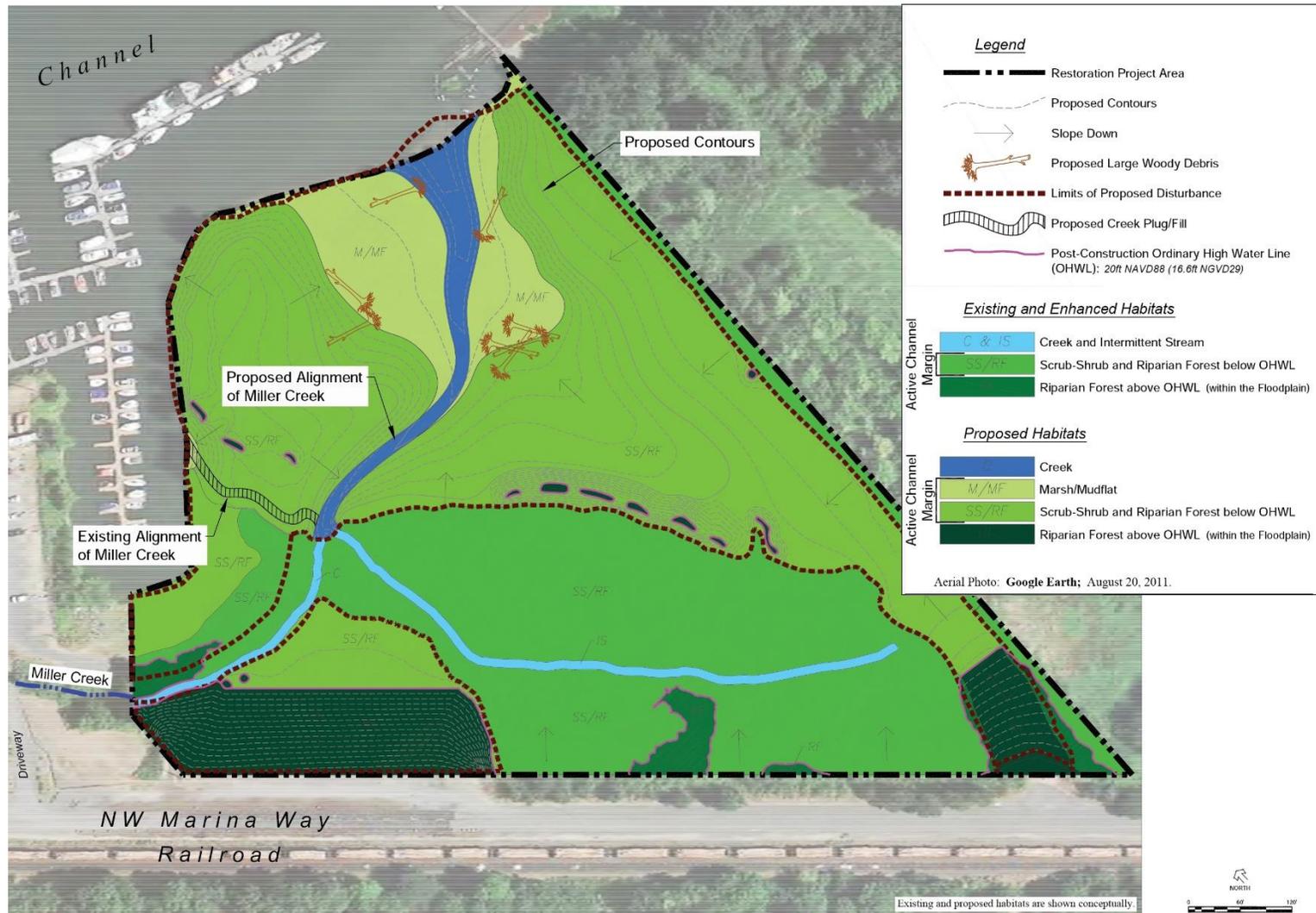


Figure 7. Restoration Proposed at the Miller Creek Restoration Site

3.1.2.5 Project 5 – Rinearson Natural Area

Rinearson Natural Area is a restoration site that was implemented by the Columbia Restoration Group (CRG) who regraded the site to restore typical floodplain structure, reconnected the channel to provide fish passage at the location of a former dam, improved in-stream habitat through wood structures, improved water quality, and repopulated the riparian area with native vegetation. A major goal of the project was to increase use by fish and wildlife species by improving access to and quality of habitat. The restoration includes active channel margin, riparian, off-channel, and upland habitats. The Rinearson Natural Area project is within the Trustee Council's Broader Focus Area for restoration, located at the confluence of the Willamette River and Rinearson Creek at Meldrum Bar Park. See Figure 3 for the project location and Figure 8 for a depiction of the restoration proposed for the Rinearson Natural Area.

The Rinearson Natural Area site is already generating ecological benefits as demonstrated by the presence of hundreds of coho smolts after dam removal in a location that housed no smolts prior to restoration. A deed restriction is in place to cover the entire Rinearson Natural Area site, which includes part of Meldrum Bar Park, Robinhood Homeowner's Association Land, and land of a single private landowner. A conservation easement is planned for the site before the 10-year performance period ends. The CRG specializes in the entitlement, development, and operation of ecological offset projects like this one. The Rinearson Natural Area project includes baseline, implementation, effectiveness, and long-term monitoring as part of its stewardship plan. Currently, CRG is completing year 1 monitoring.

The Rinearson Natural Area restored important off-channel habitats that serve as a refuge for juvenile salmonids and habitat for other target species in the Portland Harbor Restoration Service Area comprised of the PHAA and Broader Focus Area. The City of Gladstone and the Robinhood Homeowner's association expressed public support for the project. CRG identifies the ESA species in the area as the primary unique opportunity for restoring this floodplain.

The Rinearson Natural Area was included as a potential restoration site in the Trustee Council's Ecological Restoration Portfolio in 2012 under the project name Rinearson Creek Natural Area. The Trustee Council provided technical assistance during the planning of this project and continues to provide oversight of its performance since implementation.

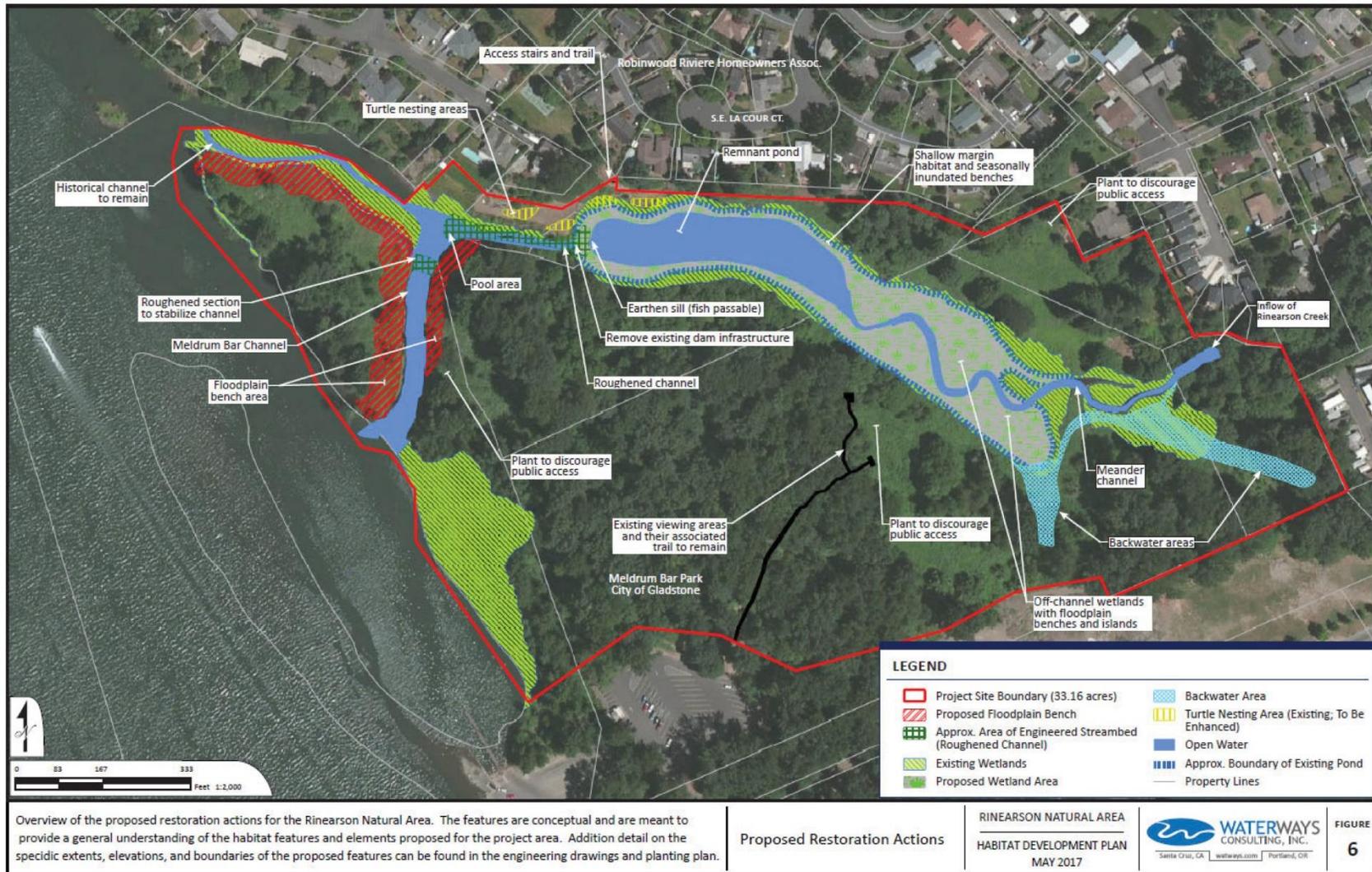


Figure 8. Restoration Implemented at the Rinearson Natural Area

3.1.3 Evaluation of Restoration Banks

For the purposes of analysis in this document, the Restoration Bank Credit Alternative is being evaluated as a whole, based largely upon the five specific restoration bank projects proposed in response to the RFP and determined to be eligible for consideration under this restoration alternative. The Trustee Council also individually evaluated each of the five restoration bank proposals summarized above, using the eligibility and selection criteria outlined in the RFP. The evaluation of each project is available in Appendix B, Restoration Bank Proposal Evaluations. Those individual project evaluations are aggregated and summarized below.

3.1.3.1 Restoration Objectives and Selection Criteria

The Trustee Council evaluated each restoration bank proposal against the selection criteria outlined in the RFP. Each of these projects was initially proposed to the Trustee Council prior to 2012, screened against the criteria developed for fish and wildlife, and ultimately included in the Ecological Restoration Portfolio. Based upon the information included in the current project proposals, the Trustee Council can now confirm that restoration banks, as evidenced by the five restoration bank projects proposed, can meet all of the following objectives from the Programmatic Restoration Plan:

- Move toward normative hydrology – The restoration bank projects include features designed to restore the flow of water in and through the Restoration Service Area, including increased volume of water, increased flood storage, and longer flood flow attenuation.
- Restore floodplain function – The restoration bank projects include features designed to restore floodplain function, including appropriate slopes, connectivity between floodplain and aquatic habitats, habitat complexity elements such as large wood, where appropriate, and revegetation of floodplain areas.
- Reestablish floodplain and riparian plant communities – The restoration bank projects include robust native planting plans and commitment to ongoing vegetation maintenance to reduce invasive species and meet performance standards for native species, consistent with the Trustee Council’s monitoring and stewardship expectations.
- Improve aquatic and riparian habitat conditions – Each project includes features designed to improve aquatic and riparian habitat conditions through restoration techniques, such as fill removal; removal of pilings, docks, and other structures; regrading; and revegetation. In riparian habitats, complexity elements such as large wood, snags, and boulder piles have been included to provide protection and feeding opportunities for fish and wildlife.
- Improve river margin habitat – Each project includes design features to increase complexity in river margins, such as regrading, revegetating, and rip rap or piling removal along the river margin.
- Restore habitat that provides ecological value in the landscape perspective – The restoration bank projects proposed each restore a combination of key habitat types in important locations. The projects range in size from 13.17 acres to 54.66 acres. In the industrial setting of Portland Harbor, habitat patches of this size are especially limited along the Willamette River.

3.1.3.2 Project Performance

A strength of the restoration bank concept is that these projects can be implemented early, with the assistance of outside capital, and are not dependent upon settlements to be initiated. Three of the five restoration banks proposed to the Trustee Council have already been constructed, monitoring is underway, and the projects are achieving habitat benefits for potentially injured trust resources. The proponents of the two projects that have not yet been built suggest they are ready for implementation in the near future and could begin realizing benefits by 2022.

In addition, the restoration banks have developed rigorous monitoring and adaptive management protocols to track progress towards performance criteria. Each project plans to monitor hydrology, geomorphology, native and invasive vegetation, and wildlife, consistent with the Trustee Council’s Monitoring and Stewardship Framework (Appendix D of the Programmatic Restoration Plan). The restoration bank projects commit to conducting this monitoring for at least 10 years after restoration implementation. In addition, the banks have developed financial assurances to ensure that adaptive management funding is available to address issues that may come up with project performance during this 10-year period.

Restoration banks are subject to credit release schedules which are negotiated with the Trustee Council and limit the number of credits that may be sold from a project before the project has met agreed-upon milestones and performance standards. These credit release schedules help motivate project performance and ongoing management.

3.1.3.3 Habitat Type

In the Programmatic Restoration Plan the Trustee Council stated that it would seek to ensure that a mix of high-priority habitat types are restored for potentially injured species. Each of the five restoration banks proposed for inclusion this Final Supplemental Restoration Plan include a diversity of key habitat types, as summarized in Table 2.

Table 2. Habitat Types Restored by Restoration Bank Projects Proposed to the Trustee Council in March 2020

	Alder	Harborton	Linnton	Miller	Rinearson
Off-channel habitat	X	X	X	X	X
Active channel margin	X	X	X	X	X
Shallow-water habitat			X		
Beach habitat	X		X		
Riparian habitat	X	X	X	X	X
Upland habitat	X	X	X	X	X

3.1.3.4 Cost

An important consideration for the Trustee Council’s use of settlement funding is the complexity and current status of the NRDA. With more than 150 PRPs across more than 10 river miles, it will take a long time to complete damage assessment for the Portland Harbor Superfund Site in its entirety. For the past

decade, the Trustee Council has been focused on Phase 2, a cooperative damage assessment with a subset of the PRPs. This Final Supplemental Restoration Plan is intended to guide how the Trustee Council spends its first infusion of settlement funds recovered through Phase 2 of the NRDA process for the PHAA. The first infusion of settlement funds will not represent compensation for all injury at the site, but rather a fraction of the total injury.

From a cost perspective, purchasing credits from restoration banks is an attractive option because it is scalable to the number of credits or dollars available from one or more settlements. The Trustee Council does not have to wait to acquire restoration value until there are sufficient settlement funds for land acquisition, design, and construction. Because they are built as “banks” to address multiple PRPs’ liabilities, the restoration banks proposed are likely larger projects than the Trustee Council or partners could implement at this time with settlement funds alone. The restoration bank projects described in Section 3.1.2 vary in size from 13.17 acres to 54.66 acres.

Restoration banks also offer the benefit of reduced overall costs through economies of scale. Because the projects are larger, the costs per acre of land acquisition, planning, permitting, equipment mobilization, monitoring, adaptive management, and stewardship are lower than those same costs per acre for smaller projects. Additionally, because restoration bank developers are required to provide financial assurances for construction, ongoing management, and adaptive management, these financial securities help ensure that a restoration bank will provide the anticipated ecological benefits.

3.1.3.5 Conclusion

Based on the evaluation of restoration banks described above, including the five specific restoration bank projects proposed, the Trustee Council has selected the Restoration Bank Credit Alternative as the Preferred Alternative. This alternative includes purchase of credits by the Trustee Council with funds received by the Trustee Council from a PRP in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement.

3.2 No-Action Alternative

The Trustee Council is required to evaluate a No-Action Alternative under NEPA (40 C.F.R. § 1502.14(d)) and, similarly, a Natural Recovery Alternative under CERCLA (43 C.F.R. § 11.82(c)). Under the No-Action Alternative, no action is taken to restore natural resources and services that were lost as a result of the releases of hazardous substances and discharges of oil into Portland Harbor. If left alone, injured natural resources may eventually recover to baseline over time; however, there would be interim losses between the start of the injury and the time at which resources are fully recovered. The No-Action Alternative would not provide compensatory restoration for the interim losses to which the public is entitled under the law. Furthermore, there is no guarantee that natural recovery would return the injured natural resources to baseline condition. Shorelines that are currently providing some resource benefit could either remain as they are or become further invaded by nonnative species. Alternatively, they may be partially developed, further degrading natural resources. In summary, the No-Action Alternative would provide the most uncertain outcome regarding the future condition of injured resources and would leave the public uncompensated for compensable interim losses. Accordingly, the Trustee Council determined that the No-Action/Natural Recovery Alternative would not serve the purpose and need discussed in Section 1.4, and therefore is not preferred.

3.3 Alternatives Considered but not Further Analyzed

3.3.1 Partnering Project Alternative

This alternative would involve projects that are being proposed by a third-party implementer with the specific goal of resolving one or more PRP's NRDA liability at the PHAA. The Trustee Council would provide settlement funds to the third party for the purpose of implementing the project; however, the Trustee Council funding need not be the only funding. For example, a third party proposing to implement a project using part Trustee Council settlement funds and part grant funds from some other source would fall into this category.

The Trustee Council did not receive any proposals in this RFP category. Nevertheless, the Trustees considered whether there might be partnering projects that were not proposed but that might be appropriate for further consideration in this Final Supplemental Restoration Plan. To accomplish this, the Trustee Council consulted internally within its member agencies and entities for partnering opportunities that might qualify; it did not find any that rose to the level of inclusion in this analysis.

Ultimately, in the absence of specific proposals at this time, the Trustee Council decided not to consider this alternative further. One critical element of success in a partnering project is a dedicated project proponent that is willing and capable of taking on the myriad responsibilities that arise from the construction of a complex habitat restoration project (this was, in fact, one of the considerations laid out in the RFP). Without a project proposed by such a proponent, this type of partnering scenario is less likely to be successful.

This is not to imply that partnering opportunities cannot be suitable—and even preferable—alternatives. In potential future restoration plans, the Trustee Council may choose to undertake such projects.

3.3.2 Trustee-Led Project Alternative

A project implemented fully by the Trustee Council was one of the alternatives carried forward from the Programmatic Restoration Plan; however, the Trustee Council did not receive any qualifying project proposals in this RFP category. Furthermore, the Trustee Council did not independently identify any qualifying projects that it considered competitive with the other alternatives under consideration. While they can be desirable, and in some cases are selected under the right circumstances, the availability of high-quality restoration bank proposals the Trustee Council received meant that the Trustee Council did not need to delve deeper into the Trustee-led Project Alternative at this time. In potential future restoration plans, the Trustee Council may choose to undertake such projects.

3.3.3 Combined Alternative

It was theoretically possible that some combination of restoration banking and third-party partnering projects could have proven the most attractive option. However, given the lack of partnering opportunities discussed above and the availability of high-quality restoration bank proposals, there was no reason for the Trustee Council to further consider this combined alternative at this time. In potential future restoration plans, the Trustee Council may choose to undertake such projects.

4. AFFECTED ENVIRONMENT

Section 3 of the Programmatic Restoration Plan, which is incorporated here by reference, contains an exhaustive description of the affected environment in and around the PHAA and the Trustee Council's Broader Focus Area for restoration. For the purposes of this Final Supplemental Restoration Plan, the affected environment is summarized below. For a more detailed discussion of the affected environment, please refer to Section 3 of the Programmatic Restoration Plan. All five of the restoration bank projects considered in this Final Supplemental Restoration Plan fall within the affected environment described in the Programmatic Restoration Plan, and there are no site-specific environmental resources that were not included in that description.

4.1 Physical Environment

The affected environment includes the Restoration Service Area as shown on Figure 1. The affected environment extends 0.25 miles landward from both banks of the river. This section provides a broad historical context for the Willamette River and then describes the Restoration Service Area. Figure 9 shows the Lower Willamette Subbasin in the context of the Willamette River Basin.

4.1.1 Willamette River Historical Context

The Willamette River is the tenth largest river in the contiguous United States based on volume, and the thirteenth largest based on discharge. It flows generally northward through Oregon, drains a watershed area of approximately 11,400 square miles, and has a total length of 309 miles from its origin in the Oregon Cascade Range to its confluence with the Columbia River (Kammerer 1990).

The Willamette River Basin is composed of many tributary subbasins that drain to form the main channel of the Willamette River near Eugene, Oregon. The river flows through the broad and fertile Willamette Valley region and enters the Restoration Service Area where it flows over Willamette Falls at Oregon City and then passes through the City of Portland before joining the Columbia River. The northern (downstream) portion of the river from the Willamette Falls to the Columbia River is considered the lower Willamette River (Integral Consulting et al. 2004).

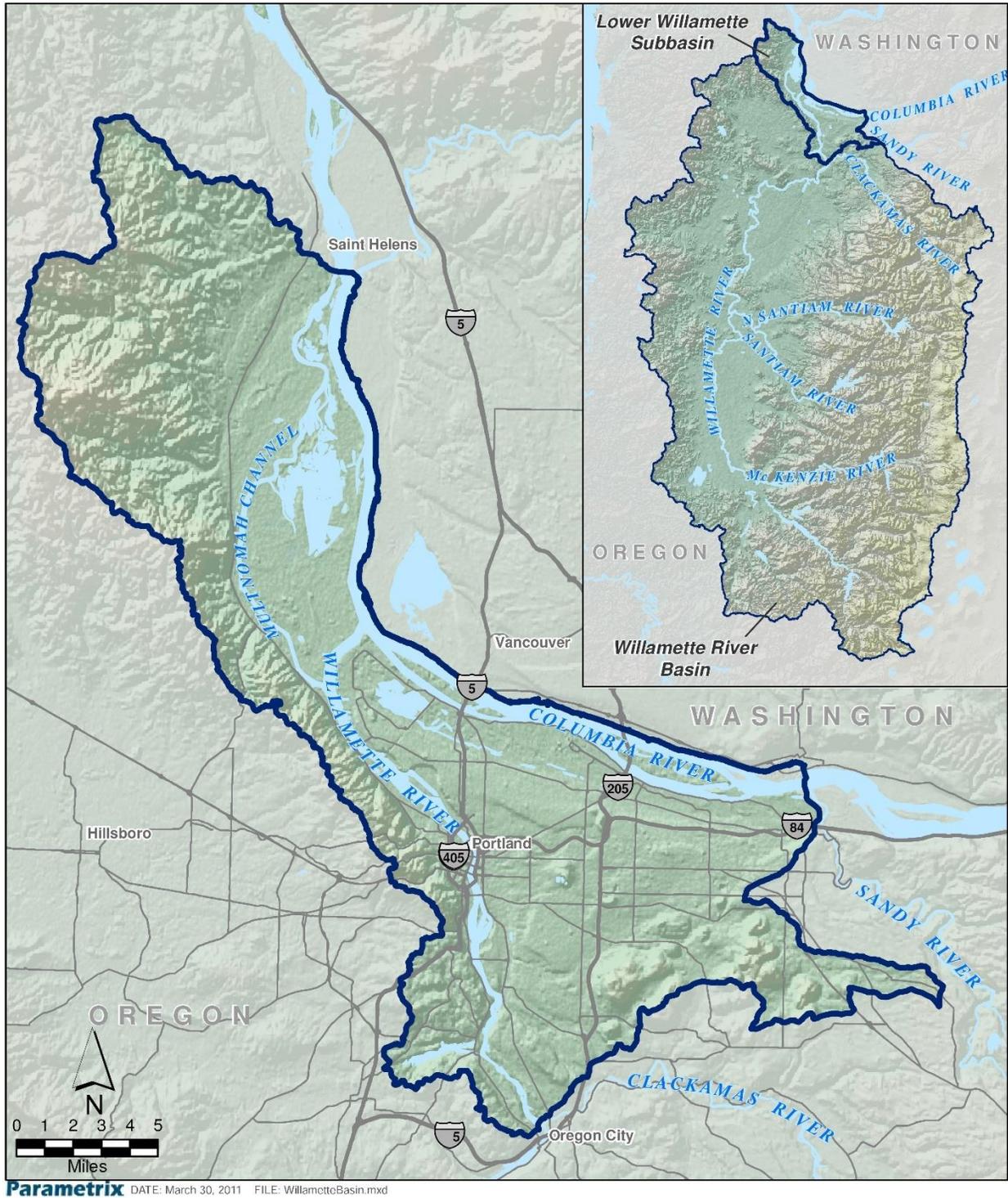


Figure 9. Lower Willamette Subbasin

4.1.2 Portland Harbor Superfund Assessment Area

The PHAA extends from river mile 0.8 to river mile 12.3 on the Willamette River and includes the upper 1.2 miles of the Multnomah Channel (see Figure 1). The lower Willamette River was historically about 0.5 miles wide, with banks dominated by beaches and wetlands and a large shoal along the east riverbank. The open water was unconstrained and dynamic, containing low-lying islands and floodplains that resulted in significant channel movement and alteration (Adolfson Associates 2008). In the last century, anthropogenic activities such as river channelization, dredging, bank hardening (riprap, seawalls), nonnative species introduction, urbanization, and industrialization have altered the historical habitats and biota of this area (Adolfson Associates 2008).

The PHAA is the primary depositional area of the Willamette River system (between river mile 3 and river mile 10). Portland Harbor serves the commercial shipping industry and contains a multitude of water-dependent and non-water-dependent industrial and commercial facilities, as well as private and municipal stormwater and wastewater outfalls. The federal navigation channel (river mile 0 to river mile 11.6) runs through the center of the river in this area and is maintained by the U.S. Army Corps of Engineers (USACE) at a depth of 40 feet. Bank stabilization and dredging measures have created a stable channel in the PHAA (PHNRTC 2007; Adolfson Associates 2008).

Although much of the Willamette River at Portland Harbor is lined by modified or armored riverbanks, some natural habitats and shoreline areas remain in the lower reach (Friesen et al. 2003). In addition to unvegetated/disturbed areas, various distinct habitat types have been classified, including bottomland forest, foothill savanna, conifer forest, scrub, meadow, shrub, emergent wetland, beach, rock outcrop, and open water (Adolfson Associates 2008). Mixed emergent and submerged aquatic vegetation is associated with the natural nearshore areas, and beaches have generally been colonized by annual grasses, perennial shrubs, and willows. The upland areas are mostly comprised of fill, although some ponds, wetlands, sloughs, side channels, and forested habitats remain (PHNRTC 2007).

Releases of hazardous substances and discharges of oil into the PHAA have resulted from current and historical industrial and municipal activities and processes since the early 1900s. Facilities released hazardous materials and oil through spills, permitted and non-permitted discharges, stormwater runoff from contaminated soils at upland facilities, and discharge of contaminated groundwater. Other releases into the Willamette River upstream of the PHAA include metals from historical mining activity, agrochemicals from agricultural and timber operations along the river and its tributaries, and resuspension of deposited contaminated materials from aggregate mining operations (PHNRTC 2007).

4.1.3 Broader Focus Area for Ecological Restoration

The Broader Focus Area includes portions of Multnomah, Clackamas, and Columbia Counties, Oregon (see Figure 1). It includes the Willamette River from the southern end of the PHAA to Willamette Falls, and it includes the immediate confluences of major tributaries (Johnson Creek, Tryon Creek, the Clackamas River, and Kellogg Creek), the lower Columbia River on the Oregon side from the east end of Hayden Island to the Multnomah Channel outlet (including a portion of the western end of Hayden Island), all of Multnomah Channel, and portions of Scappoose Bay. The areas outside of the PHAA that are included in the Broader Focus Area are more similar to the historical condition as described above in the description of the PHAA. Regardless, considerable changes have occurred in much of the Broader Focus Area including many of those described for the PHAA.

4.2 Biological Environment

As mentioned above, much of the Willamette River at Portland Harbor is modified, and the surrounding area is highly urbanized with little natural habitat remaining. Historically, at least 39 species of resident and anadromous fish, including 20 native species, have been documented in the lower Willamette River (Farr and Ward 1993). The Restoration Service Area serves as a critical migratory corridor for both juvenile and adult anadromous fish, and as a juvenile rearing habitat for several fish species, including Pacific salmon, Pacific lamprey, and white sturgeon. Migratory bird species nest near or within the Restoration Service Area and forage in the open water and nearshore habitats. Mammals, reptiles, amphibians, and invertebrates forage and rear in the river corridor and shoreline habitats. ESA-listed species potentially found within the Restoration Service Area include Lower Columbia River (LCR) coho salmon, Snake River Chinook salmon (spring/summer), Snake River Chinook salmon (fall), Upper Willamette River Chinook salmon, LCR Chinook salmon, Snake River sockeye salmon, Columbia River chum salmon, Snake River steelhead, Upper Columbia River steelhead, Middle Columbia River steelhead, LCR steelhead, Upper Willamette River steelhead, Columbia River bull trout, Southern Distinct Population Segment (DPS) of green sturgeon, Southern DPS of eulachon, Columbia River DPS of Columbian white-tailed deer, streaked horned lark, Western DPS of yellow-billed cuckoo, Willamette daisy, Bradshaw's desert parsley, Nelson's checker-mallow, water howellia, Kincaid's lupine, and golden paintbrush.

4.3 Socioeconomic Environment

The Portland metropolitan area historically relied on Portland Harbor to expand commerce and industrialization as a seaport for timber and grain. By 2011, activities in the harbor were supporting nearly 18,000 jobs, created \$1.5 billion of personal wage and salary income, and generated \$1.47 billion in income earned by Portland-area businesses and workers as a result of spending by harbor-related businesses (PBA 2013).

The lower Willamette River also is a popular area for sport fishing and contributes to the area's economy by generating approximately \$34.7 million in travel expenditures (Dean Runyan Associates 2009). Recreation and park facilities of local, regional, and national significance are located within the Restoration Service Area. These include public docks, community centers, trails, and traditional open spaces for biking, hiking, and bird watching.

Some populations rely directly on the natural resources and their services provided by the lower Willamette River. Proportionally, these populations tend to be from a cohesive community group or ethnic background with cultural traditions, such as fishing as a major source of food for families, or have lower income and rely on fishing to supplement food sources. In addition to these populations, Native American tribes traditionally harvested fish from the Willamette River as a major component of their diet, and recent research has focused on determining the extent to which they continue to do so. For these populations that rely on these resources, the status of the resources provided by the lower Willamette River becomes an environmental justice issue, because many who rely on these resources are from ethnic minority groups.

5. ENVIRONMENTAL CONSEQUENCES

In considering the proposed restoration action, the Federal Trustees (NOAA and DOI) are responsible, under NEPA, for conducting an analysis of the potential environmental impacts of proposed federal actions. The Federal Trustees' Programmatic Restoration Plan and this environmental assessment provide this environmental analysis to support the Trustee Council's decision and to encourage and facilitate involvement by the public in the environmental review process.

As discussed in Chapter 3, the Trustee Council received no project proposals in the categories of Trustee-led Project Alternative or Partnering Project Alternative. Accordingly, there is effectively only one "action" alternative considered further in this Final Supplemental Restoration Plan: the Restoration Bank Credit Alternative (Preferred Alternative).

This environmental assessment assesses potential environmental (including social and economic) impacts associated with the Preferred Alternative and the No-Action Alternative. In developing this environmental assessment, NOAA, on behalf of the Trustee Council, adhered to the procedural requirements of NEPA, the CEQ regulations for implementing NEPA (40 C.F.R. §§ 1500-1508), and NOAA's procedures for implementing NEPA.¹⁴

The following definitions are used to characterize the nature of the various impacts evaluated with this Final Supplemental Restoration Plan:

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. In general, short-term impacts are those that would occur only with respect to a particular activity or for a finite period, or only during the time required for installation activities. Long-term impacts are those that are more likely to be persistent and 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 later in time or be farther removed in distance but still be a reasonably foreseeable outcome of the action. For example, a direct impact of erosion on a stream might include sediment-laden waters in the vicinity of the action, whereas an indirect impact of the same erosion might lead to lack of spawning and result in lowered reproduction rates of indigenous fish downstream.

Minor, moderate, or major impacts. These relative terms are used to characterize the magnitude of an impact. Minor impacts are generally those that might be perceptible but, in their context, are not amenable to measurement because of their relatively minor character. Moderate impacts are those that are more perceptible and, typically, more amenable to quantification or measurement. Major impacts are those that, in their context and due to their intensity (severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 C.F.R. § 1508.27) and, thus, warrant heightened attention and examination for potential means for mitigation to fulfill the requirements of NEPA.

Adverse or beneficial impacts. An adverse impact is one having adverse, unfavorable, or undesirable outcomes on the human-made or natural environment. A beneficial impact is one having positive outcomes on the human-made or natural environment. A single act might result in adverse impacts to one environmental resource and beneficial impacts to another resource.

¹⁴ NOAA Administrative Order (NAO) Series 216-666A6, Environmental Review Procedures for Implementing the National Environmental Policy Act (NAO 216-666A6).

5.1 Impacts of the Restoration Bank Credit Alternative (Preferred Alternative)

This alternative includes purchase of credits by the Trustee Council with funds received by the Trustee Council from a PRP in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement.

This alternative involves large-scale projects designed primarily to restore certain types of habitats that support a range of species and associated natural resource services that are likely to have been injured. Unlike trustee-implemented or partnering projects, restoration banks are not generally implemented to address the liability of one party for one purpose. Rather, they are generally developed prospectively by commercial restoration bank developers with the intent of selling credits to other parties with environmental liability. Some banks are designed to create credits available for multiple purposes (e.g., NRDA restoration credits, ESA conservation credits, and CWA wetland mitigation credits).

Because restoration banks are generally developed prospectively by private entities and independent of any particular legal settlement, the “federal action” under NEPA resulting from a credit purchase would arguably be a simple financial transaction. That stated, the current proposals are a mix of existing and yet-to-be-constructed restoration banks. In addition, all the implementers sought technical assistance from the Trustee Council early in the restoration planning process. In other words, there has been some direct Trustee Council involvement in the development of these projects. Therefore, even though these projects themselves do not necessarily qualify as “major federal actions” under NEPA, the Federal Trustees, in the interest of transparency and thoroughness, are conducting a full NEPA analysis of these projects as if they were being carried out by a federal entity.

Because the Trustee Council will be determining the volume and location of purchased credits after completion of the Final Supplemental Restoration Plan, the Federal Trustees are evaluating the proposed restoration banks (discussed above in Chapter 3) in aggregate. Generally, the types of impacts generated (or that the Trustee Council anticipates would be generated) across restoration banks are similar; however, where one or more projects would result in unique impacts, the Federal Trustees will identify and discuss that potential impact specifically.

5.1.1 Land Use, Shoreline Use, and Aesthetics

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to land use, shoreline use, or aesthetics. Construction of restoration projects for the Restoration Bank Credit Alternative would result in minor adverse short-term impacts and beneficial long-term impacts to land or shoreline use. In most cases, projects could be built along the existing shore without affecting existing land and shoreline uses. Some restoration sites could prevent future industrial or other pre-restoration use of the land. However, at a programmatic scale, construction of restoration projects for the Restoration Bank Credit Alternative is not anticipated to displace a significant amount of other existing land uses. All restoration projects would be subject to applicable land use regulations. It is noteworthy that certain project sites such as the Linnton Mill Restoration Site and Alder Creek Restoration Project, though sites of previous industrial use, were for sale or out of active industrial use for years prior to restoration implementation on the sites. On submerged and submersible lands owned by DSL, certain shoreline uses sometimes permitted in Portland Harbor may be prevented in the future by deed restrictions or conservation easements placed to protect the ecological value of aquatic habitats at the restoration project sites.

Construction of restoration projects for the Restoration Bank Credit Alternative would likely increase the amount of shoreline habitat within the Restoration Service Area because the focus is to plan for habitat improvement and restoration, including creation of off-channel habitat, thus having a minor to moderate long-term beneficial indirect impact on shorelines.

During the construction phase of a project under the Restoration Bank Credit Alternative, a specific project site could have minor to moderate direct short-term adverse impacts to the aesthetic environment, though long-term minor to moderate direct impacts would be beneficial. Poor aesthetics may temporarily result from disturbed soils, piles of debris, noise, and other construction-related site disturbance including temporary detours around construction areas. There is a possibility that some of the construction work would be conducted at night and require construction lighting. If nighttime construction lighting were used, the projects would be required to comply with local light and glare regulations and use best management practices for avoiding light and glare pollution. At a project such as the Linnton Mill Restoration Site, newly created upland habitats could change the aesthetics of the site, temporarily replacing previous views with unvegetated hillside. These minor to moderate short-term adverse direct impacts are anticipated to be less noticeable in the urbanized and industrial portions of the Restoration Service Area and could cause more of an impact at sites that are not surrounded by existing development. Following construction, restoration sites would likely have more natural aesthetics than were present prior to the restoration action, if, for example at the Linnton Mill Restoration Site, concrete and buildings were replaced with native vegetation, providing a minor to moderate long-term beneficial direct impact on the aesthetic environment.

5.1.2 Socioeconomics

The analysis of socioeconomic impacts covers several topics, including the potential for impacts to the industrial economy from conversion of industrial land to restoration use, potential impacts to harbor water-dependent activities, the potential for economic impacts from restoration, potential impacts to environmental justice populations and impacts to property values adjacent to restoration sites. The analysis below describes the impacts of the construction of restoration projects for the Restoration Bank Credit Alternative. The financial transaction of the Restoration Bank Credit Alternative is expected to have minor, short-term, direct, beneficial impacts to the economy through the infusion of capital into the economy.

5.1.2.1 Conversion of Industrial Land

As noted above under impacts to land use, some restoration sites may prevent future industrial or other pre-restoration use of the land. However, at a programmatic scale, the Restoration Bank Credit Alternative is not anticipated to displace a significant amount of other existing land uses. All restoration projects would be subject to applicable land use regulations. It is noteworthy that certain project sites such as the Linnton Mill Restoration Site and Alder Creek Restoration Project, though sites of previous industrial use, were for sale or out of active industrial use for years prior to restoration implementation at the sites. Given that conversion of industrial land to restoration use represents a small percentage of available industrial land in Portland Harbor, only minor or no adverse impact is anticipated on the quantity of land available for industrial or water-dependent uses.

5.1.2.2 Water-Dependent Activities

Activities required to maintain industrial facilities and uses outside the restoration project sites (such as dock maintenance, slip dredging, etc.) as well as dredging that is required to maintain the Willamette

River's navigational channel, are already regulated through the ESA and other laws. Since ESA-listed species are already present and using habitats within the harbor, no additional regulation or restriction is anticipated to result from restoration of habitat in the area; therefore, no adverse impact is anticipated on industrial and shipping activities.

5.1.2.3 Restoration and Business Impacts

There are moderate short-term economic benefits to local businesses both from being awarded restoration contracts and from spending by construction workers and professionals who conduct monitoring and site stewardship. Property owners and the restoration industry (plant, soil, and materials suppliers) would also benefit. Research has shown that watershed restoration can generate between 15.7 and 23.8 jobs per \$1 million spent and can result in an additional 1.4 to 2.4 times that amount as the investment cycles through the local and regional economy (Nielsen-Pincus and Moseley 2010). Given that the projects proposed under the Restoration Bank Credit Alternative are being managed by private sector companies with a profit motive, it is anticipated that there would be additional economic benefits from the projects at the regional or national level.

5.1.2.4 Environmental Justice Populations

Long term, there is the potential for minor to moderate beneficial socioeconomic impacts from the array of ecological services and social benefits that healthy habitats and natural resources provide, particularly in an urban and industrial setting such as Portland Harbor. For example, improving fish population health (i.e., growth rates, survival rates, and total numbers) and shoreline aesthetics could benefit recreational and subsistence fishing in the Willamette River.

Some populations rely directly on the natural resources and their services provided by the lower Willamette River proportionately more than the larger population. These people tend to be from a cohesive community group or ethnic background with cultural traditions, such as fishing as a major source of food for families, or have lower income and rely on fishing to supplement food sources. These populations can be considered as environmental justice populations because, as described below, they are from ethnic minority groups. Executive Order 12898 (59 FR 7629; February 16, 1994) requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.

The beneficial effect of improving fish population health would provide a proportionately greater benefit to the Native American populations who harvest fish, particularly lamprey, from the Willamette River at a higher rate than the general population does. Similarly, improved air and water quality would result from conversion of the built environment to the natural environment, resulting in long-term beneficial impacts to environmental justice populations.

5.1.3 Cultural and Historic Resources

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to cultural and historic resources. Prior to conducting restoration at a specific location under the Restoration Bank Credit Alternative, the project proponent is required to consult with the State Historic Preservation Office (SHPO) and the relevant tribes and conduct investigations to identify cultural and historic resources subject to Section 106 of the National Historic Preservation Act (NHPA). Project-specific consultation under Section 106 of the NHPA would be initiated by the appropriate

federal agency if a project might affect historic or cultural resources. This consultation is more often led by USACE as part of a project's CWA permitting. Projects are designed to avoid impacts to cultural and historic resources if the resources are found in the Restoration Service Area. If any resources are discovered during implementation of any restoration actions, all soil disturbance would stop immediately, and SHPO and other appropriate authorities would be notified.

Moderate long-term adverse impacts to historic resources would be possible at projects constructed under the Restoration Bank Credit Alternative. At the Linnton Mill Restoration Site, historic resources were identified in the old mill building which was dismantled. The project proponent is required to mitigate for the impacts to these resources by commemorating the resources in educational signage that would be placed along the recreational path on the site. Other projects would be expected to conduct similar mitigation, if required.

Moderate long-term beneficial impacts are anticipated with improvements to habitat that supports Pacific lamprey, salmon, and sturgeon, all species with traditional importance to Native American tribes.

5.1.4 Energy

There are no anticipated effects to energy generation resources from the financial transaction or construction of projects for the Restoration Bank Credit Alternative. Most banks do not occur on sites with energy infrastructure, and the one that does (Harborton Restoration Project, proposed by PGE) is being developed by the energy provider in a way that would not affect its ability to provide services.

Consumption of energy resources resulting in the production of greenhouse gas (GHG) emissions is discussed in Section 5.1.10.2, Climate.

5.1.5 Geologic and Soil Resources

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to geologic and soil resources. There are no known mineral or oil deposits in the areas where the proposed banks are located. Given the history of intense use of the riverfront in Portland Harbor, some project sites are located in land that was in a previously developed/disturbed/filled state. In those cases, construction of habitat could provide a long-term increase in the quality of soils and sediments (through removal of contaminants potentially present in the soil and introduction of natural soil types), as well as a long-term reduction in sediment erosion in the river. Both of these changes would be long-term minor beneficial direct impacts to geologic and soil resources as a result of restoration implementation.

Short-term minor adverse direct impacts could include soil disturbance caused by grading, excavation, and soil removal from implementation of projects. Erosion has been or would be controlled through best management practices at individual restoration projects. All projects have been or would be required to comply with state and federal removal/fill regulations.

5.1.6 Recreation

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to recreation. The projects proposed under the Restoration Bank Credit Alternative have improved or could improve the aesthetics of the shoreline in Portland Harbor, replacing hard armoring with vegetated shorelines and increasing use by wildlife. Therefore, the experience of kayaking or boating in the area may be enhanced by the creation of more natural habitat along the river and more wildlife sightings.

These are long-term minor to moderate beneficial indirect impacts from enhancing the shorelines and riparian areas.

Public use on any restoration project site should be carefully considered and designed, and potentially redirected, in order to minimize any degradation of potential NRDA restoration-related ecological values. Implementation of a restoration project may permanently restrict access or restrict some recreation activities at a recreation area for the long-term protection of natural resources. One example of this is newly installed fencing and enforcement in the portions of Meldrum Bar Park that fall within the Rinearson Natural Area. Though a trail remains within the Restoration Service Area, recreational use of the off-trail areas is discouraged. People previously using those parts of the site for recreation may need to seek alternative recreation locations. In other cases, such as at the Linnton Mill Restoration Site, new recreational opportunities are available for passive recreational use. A paved path and overlook now provide visual access to the lower Willamette River and will soon have information kiosks that provide environmental education to visitors. This project aims to improve river access for passive recreational use while simultaneously directing human use away from sensitive ecological areas. The other three restoration banks are, and are intended to remain, private property, with no recreational uses proposed. This would result in long-term minor to moderate direct adverse impacts to public access for recreation.

Short-term minor adverse direct impacts to recreation areas may include temporary dust, noise, construction debris, or short-term closures or detours around portions of recreation areas with potentially less parking available. If construction occurs at night, night lighting may interfere with certain night recreation activities. These impacts would be focused around the restoration project, and construction would follow best management practices to minimize disturbances for recreation users.

5.1.7 Transportation, Utilities, and Public Services

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to transportation, utilities, and public services. Under the Restoration Bank Credit Alternative, there could be short-term minor adverse direct impacts to transportation or utilities during construction of individual projects; although, the impacts should be limited to small areas for short time periods. Restoration projects are generally designed to avoid impacting existing utilities (e.g., water, sewer, natural gas pipelines) where possible; however, some utilities may need to be relocated. Overall, implementation of the Restoration Bank Credit Alternative is not expected to increase demand for public services and utilities or impact public services or utility facilities, so no long-term impacts are anticipated.

5.1.8 Wetlands

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to wetlands. In the long term, implementation of projects under the Restoration Bank Credit Alternative would have minor to moderate beneficial direct and indirect impacts by improving and/or increasing the amount of wetland habitats within the Restoration Service Area to maximize the level of ecological functions within and bordering the specific area of restoration. Short-term minor adverse direct impacts to wetlands may occur during restoration project construction, but would be minimized to the extent possible. At the Harborton Habitat Development Site in particular, preservation and enhancement of wetland habitat is a goal of the project. Given the sensitivity of the red-legged frogs that depend on the wetlands at the Harborton Habitat Development Site, special best management practices and design

considerations are planned to limit the potentially moderate, short-term, adverse impacts of construction to the wetlands used by red-legged frogs.

5.1.9 Biological Resources

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to biological resources. Restoration projects implemented under the Restoration Bank Credit Alternative provide increased habitat for aquatic- and riparian-associated animal species, including fish, birds, and other wildlife, and many plant species. This increase of habitat would be a long-term major beneficial direct impact of restoration implementation to aquatic- and riparian-associated species. Construction and adaptive management activities would need to be implemented in a manner that avoids short-term effects as much as possible using best management practices; however, some short-term minor adverse impacts, both indirect and direct, could occur. For in-water or near-water activities, this would be addressed through selective scheduling of construction periods to minimize or avoid impacts and implementation of methods to minimize in-water disturbances such as turbidity, sound, and light. For example, at the Harborton Habitat Development Site, best management practices would include selective scheduling and targeting of herbicide application in wetlands and other efforts to minimize disturbance to red-legged frogs.

This Final Supplemental Restoration Plan anticipates that in the long term, the restoration projects would improve fish and other species' habitat structure and function and, therefore, benefit these species with increased habitat quantity and quality. These benefits would include improved and increased habitat in designated Essential Fish Habitat and critical habitat for ESA-listed species. The Restoration Service Area was identified as the most habitat-limited portion of the lower Willamette River for ESA-listed juvenile Chinook salmon by a group of scientists convened by the Trustee Council. In addition to identifying the Restoration Service Area as a highly important rearing and feeding location, the scientists concluded that it is also the most altered section of the river. The most limited or scarce habitat types within this area include refuge from mainstem Willamette River flows, shallow-water and beach habitats with or without large wood assemblages, and undulating natural shorelines. Given these conditions, implementing the Restoration Bank Credit Alternative within this area is likely to provide long-term benefits to federally listed salmon.

5.1.10 Public Health and Safety

5.1.10.1 Air Quality

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to air quality. During the construction phase under the Restoration Bank Credit Alternative there would be minor short-term adverse direct impacts from increases in exhaust and dust from the use of construction equipment. Construction would follow best management practices, including the use of low-emission fuels, to limit dust and emissions to the extent possible. Native revegetation of previously industrial project sites is expected to have minor long-term beneficial impacts to air quality.

5.1.10.2 Climate

Section 4.3.10.2 of the Programmatic Restoration Plan provides a description of how the Trustee Council has approached restoration design and management to provide maximum adaptability to climate change. What follows here is an analysis of the impacts of the Restoration Bank Credit Alternative on climate.

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to climate. Minor short-term adverse direct effects on GHG emissions are expected as a result of the Restoration Bank Credit Alternative. Actions resulting in GHG emissions may include the use of heavy equipment for construction, transport of materials needed for construction, and other activities associated with pre- and post-implementation such as monitoring and adaptive management. These activities have the potential to generate GHG emissions through the use of oil-based fuels and consumption of both renewable and nonrenewable resources. However, the amount of GHG emissions generated through this activity is not anticipated to be significant due to the limited number of restoration projects (i.e., up to five considered in the Preferred Alternative, some of which have already been constructed) and extended construction time (construction of each project is occurring at different times from 2014 to 2022). Habitat restoration projects could increase carbon storage capacity of soils and plant communities, contributing to carbon sequestration, which could result in long-term minor beneficial impacts to climate change adaptability.

5.1.10.3 Environmental Health and Noise

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to environmental health and noise. No known long-term risks to environmental health would be expected to result from projects under the Restoration Bank Credit Alternative. A health and safety plan would be in place to address any potential hazards during construction of specific projects, and all appropriate safety equipment would be used. It is anticipated that restoration projects implemented under this alternative would result in short-term minor adverse direct noise impacts in a small area around each project location from the use of heavy equipment during the construction phase of the projects. Outside of the immediate project site, the increase in noise should be minimal. Restoration projects are subject to the noise ordinances in place in the applicable jurisdiction and must acquire noise permits or variances if construction would create noise levels beyond those allowed outright. In the long term, beneficial impacts could result from an increase in riparian vegetation that could provide a noise buffer along the river, which would result in minor beneficial indirect impacts to environmental health and noise.

5.1.10.4 Floodplain and Flood Control

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to floodplain and flood control. Under the Restoration Bank Credit Alternative, implementation of restoration would improve and/or increase the amount of potential floodplain habitat and connectivity. For all five of the proposed projects, where fill, levees, berms, or dams are removed or breached, long-term changes in floodplain location could be expected. Increasing floodplain habitat, connectivity, and vegetation maximizes the level of ecological functions within and bordering restoration areas and helps to stabilize riverbanks, control erosion and sedimentation, improve water quality by filtering pollutants, and increase storage capacity. Thus, this alternative would have a long-term minor beneficial direct impact to floodplain and flood control. Short-term minor adverse impacts would occur during construction from disturbance to the existing floodplain.

5.1.10.5 Water Quality

The financial transaction of the Restoration Bank Credit Alternative would not have any impacts to water quality. The Restoration Bank Credit Alternative is expected to cause minor localized short-term adverse direct impacts through increases in turbidity where in-water work is part of a restoration

activity. Streamside work could add sediment or other pollution to stormwater runoff into the specific project area's waters, and there is potential for unanticipated release of contaminants during in-water excavation. Best management practices would be used that would define the time of year in-water or near-water work would be allowed, limit turbidity increases and duration, capture and treat stormwater as appropriate, and require water quality monitoring during construction. Pollutants on the CWA Section 303(d) list are not expected to be present at the restoration sites, would be cleaned up prior to restoration activities, or would be isolated from restoration activities.

In addition, habitat construction, ongoing maintenance, and adaptive management of vegetation at restoration projects often includes the use of herbicides. Best management practices for herbicide use include limitations on which products to use in sensitive habitats, specific application methods, distance from open water, and other strategies to limit adverse impacts. These activities could have minor short-term adverse direct impacts to water quality, though they are designed to minimize all such impacts.

It is expected that all of the projects implemented under this alternative would add and/or enhance riparian vegetation which could improve temperature in CWA Section 303(d)-listed areas and decrease stormwater sediment and contaminant input, addressing a parameter of concern in the lower Willamette River. These improvements would be long-term minor to moderate beneficial indirect impacts.

5.2 Impacts of the No-Action Alternative

Under the No-Action Alternative, no federal action is taken to restore natural resources and services that were lost as a result of releases of hazardous substances and discharges of oil into Portland Harbor. The No-Action Alternative does not meet the purpose and need for restoring any injured resources and services. Although natural attenuation may result in some reduction in the level of contamination in Portland Harbor, and conditions for natural resources may improve gradually over time, the No-Action Alternative would not result in compensation for injuries to natural resources or services. This alternative would have no beneficial impacts to elements of the environment, as natural resources would not fully recover without restoration and would remain injured. Under the No-Action Alternative, some habitat recovery could result from another federal action (such as an ESA-related action), but not from the federal action being evaluated in this Final Supplemental Restoration Plan. There would be neither associated funding costs nor any economic benefits with the No-Action Alternative.

5.2.1 Land Use, Shoreline Use, and Aesthetics

Land use and aesthetics would not experience any changes as a result of the No-Action Alternative. In the long term, the amount of shoreline habitat would not increase, and the shoreline that exists is expected to remain in a degraded condition, which is not of sufficient quality or quantity to fully support the key species that are the focus of NRDA.

5.2.2 Socioeconomics

No impacts are anticipated from the No-Action Alternative.

5.2.3 Cultural and Historic Resources

No impacts are anticipated from the No-Action Alternative.

5.2.4 Energy

No impacts are anticipated from the No-Action Alternative.

5.2.5 Geologic and Soil Resources

No impacts are anticipated from the No-Action Alternative.

5.2.6 Recreation

No short-term impacts are anticipated under the No-Action Alternative. In the long term, the resources that support recreational activities, such as boating, wildlife viewing, fishing by boat and from shore, and kayaking, would not improve and would remain in their current degraded condition.

5.2.7 Transportation, Utilities, and Public Services

No impacts are anticipated from the No-Action Alternative.

5.2.8 Wetlands

No short-term impacts are anticipated under the No-Action Alternative. In the long term, wetlands in the area would remain in their current existing condition.

5.2.9 Biological Resources

No short-term impacts are anticipated under the No-Action Alternative. In the long term, habitat would remain in its current degraded condition. Biological resources dependent on that habitat, and whose populations are impacted due to its condition, would continue to experience adverse population level impacts.

5.2.10 Public Health and Safety

5.2.10.1 Air Quality

No impacts are anticipated from the No-Action Alternative.

5.2.10.2 Climate

No impacts are anticipated from the No-Action Alternative.

5.2.10.3 Environmental Health

No impacts are anticipated from the No-Action Alternative.

5.2.10.4 Floodplain and Flood Control

No short-term impacts are anticipated under the No-Action Alternative. In the long term, floodplain connectivity and storage capacity in the area would remain in their current degraded conditions.

5.2.10.5 Water Quality

No short-term impacts are anticipated under the No-Action Alternative. In the long term, water quality in the area would remain in its current degraded condition.

5.3 Cumulative Impacts

Cumulative impacts are impacts to the environment that result from the incremental impact(s) of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

In this Final Supplemental Restoration Plan, the Federal Trustees considered the potential cumulative impacts of both the No-Action Alternative and the Preferred Alternative. As noted above, the Federal Trustees have concluded that any impacts of the No-Action Alternative would be negligible; therefore, they have concluded that cumulative impacts would also be negligible in all categories. Therefore, the rest of this analysis is devoted to the Restoration Bank Credit Alternative.

The cumulative effects analysis in this Final Supplemental Restoration Plan is commensurate with the degree of direct and indirect effects anticipated by implementing the proposed federal action being considered. Restoration projects considered in accordance with an overall CERCLA action, including restoration banks, are intended to compensate for injury to natural resources under the Trustee Council's jurisdiction, and therefore are expected to have predominantly beneficial impacts toward redressing impacts to those resources.

In evaluating cumulative impacts, the Federal Trustees must consider not only the Restoration Bank Credit Alternative, but all connected and similar actions that could contribute to cumulative effects. For this Final Supplemental Restoration Plan, connected and similar actions include the remediation efforts associated with CERCLA for the Superfund site and other restoration activities that affect the same resources that the Restoration Bank Credit Alternative would affect. Besides cleanup actions, it is difficult to predict what other activities could be undertaken by other entities within Portland Harbor that could combine with NRDA restoration actions to produce cumulative impacts; however, some are known. Maintenance dredging will occur as needed for navigation, and waterfront facilities, such as those owned by the Port of Portland and others, will be maintained. The Federal Trustees expect most of these actions to have at least short-term negative impacts to the environment from construction activities, but some of them may have long-term negative impacts if activities are prolonged. It is possible that some may result in long-term adverse impacts to habitats or species in Portland Harbor; although, presumably, mitigation measures would be used to minimize such impacts, and actual mitigation of habitat might be required. To the extent that such impacts occur, the benefits from the restoration banks included under the Restoration Bank Credit Alternative would likely offset these impacts. As such, this analysis focuses on similar restoration actions.

The Federal Trustees are aware of several plans, projects, and programs that may have similar environmental impacts as the restoration banks included in the Restoration Bank Credit Alternative. Along with the remedial actions, these activities are being considered as connected and similar past, present, and reasonably foreseeable future actions. They include the following:

- Upper Willamette River Conservation and Recovery Plan for Chinook Salmon and Steelhead
- Lower Columbia Recovery Plan

- Willamette River Basin Flood Control Project
- Willamette River Habitat Protection and Restoration Program
- Lower Willamette River Ecosystem Restoration General Investigation and Restoration Plan (USACE and City of Portland, WRDA)
- DSL Lower Willamette River Management Plan

The general intent of these plans, projects, and programs is to restore or enhance habitats preferred by salmonids and other native organisms. Restoration and enhancement can take many forms, and might occur in watersheds above, within, or below the locations of the included restoration banks. Some programs, such as the enhancement actions associated with the Willamette River Basin Flood Control Project are required, but others focus on the identification of limiting factors and provide a suite of potential action categories that could be implemented to address the limiting factors. Only the Lower Willamette River Ecosystem Restoration Project addresses specific, foreseeable actions within this Final Supplemental Restoration Plan's Restoration Service Area. Should the actions identified in the Lower Willamette River Ecosystem Restoration Project be implemented, benefits to native fish, wildlife, and other organisms are likely.

Specific benefits within this Final Supplemental Restoration Plan's Restoration Service Area are not quantifiable at this time due to lack of specific project designs and specific location information. This cumulative impacts analysis considers guidelines within the other plans, projects, and programs in order to make some reasonable assumptions about potential cumulative impacts.

Actions under this Final Supplemental Restoration Plan and others, cumulatively, would be of long-term benefit. Benefits could include reduced water temperatures, increased invertebrate prey sources, improved shallow-water habitats, stronger food web interactions, decreased predation on juvenile salmonids, and reduction in potential contaminants.

The Federal Trustees anticipate that minor to moderate direct and indirect short-term adverse impacts to aesthetics, air quality, environmental health and noise, and potentially wetlands and water quality would result from restoration construction activities guided by these plans, projects, and programs. The impacts would typically occur due to increased dust, noise, and exhaust fumes; potential exposure and disturbance of contaminated soils from construction equipment; and temporary increases in water turbidity from in-water work. The various categories of potential short-term and long-term cumulative impacts are discussed below.

The geographic scope of the cumulative impacts analysis for this Final Supplemental Restoration Plan is the Restoration Service Area, which is the same as the geographic scope of the project area described in the Programmatic Restoration Plan.

The overall footprint of the included restoration banks is relatively small compared to the overall Restoration Service Area considered in the Programmatic Restoration Plan. Due to constraints such as land availability and ongoing industrial and commercial operations, projects implemented under the other similar plans, projects, or programs would likely be similar in scale, reducing the potential for overall cumulative impacts.

Cumulative indirect impacts to these resources are addressed below. Note that the Restoration Bank Credit Alternative includes restoration banks that have already been constructed, as well as others that have yet to be constructed. This analysis considers both, but emphasizes the potential cumulative impacts of the projects that remain unbuilt.

5.3.1 Land Use, Shoreline Use and Aesthetics

In the short term, the aesthetics of the lower Willamette River in the Restoration Service Area would experience minor adverse impacts from soil and vegetation disturbance and the presence of construction equipment and stockpiled materials resulting from various types of restoration. The conditions and activities associated with an urbanized river shoreline reduce the negative cumulative aesthetic effects overall. Additionally, the unbuilt restoration banks discussed in this Final Supplemental Restoration Plan and those projects implemented under similar plans would likely not occur all at the same time, so short-term impacts are expected to be isolated and relatively small. No significant cumulative short-term impacts are expected. The aesthetics of the lower Willamette River would be improved in the long term due to increased presence of natural shoreline habitat, structure, and vegetation. The ability to access shoreline areas for recreation would be increased.

5.3.2 Socioeconomics

The Federal Trustees have concluded that any cumulative adverse socioeconomic impacts related to the Restoration Bank Credit Alternative would be minor. The included restoration banks, both built and planned, have not displaced any current (or likely future) economic activity. Most have been built or planned on land that may theoretically be available for commercial activity but which hosts no such activity now. In some cases, restoration bank projects are able to retain commercial use in a limited footprint while allowing for habitat restoration to occur on the majority of the project site. The project most closely related to economic activity, PGE's proposed Harborton Habitat Development Site, has been carefully designed to protect habitat while maintaining power generation infrastructure. Projecting how these minimal (or non-existent) socioeconomic impacts combine with future potential impacts, cumulatively significant impacts seem unlikely for a number of reasons.

Future projects may occur along the shoreline and not adversely impact ongoing economic activity on a site (e.g., Harborton Habitat Development Site). Where land is zoned for commercial or industrial development along the banks of the lower Willamette River, activities are also typically subject to federal, state, and local environmental regulations, which control impacts to the river, riverbank, and some adjacent floodplain and riparian areas. Thus, restoration in these areas would not have a significant economic impact because commercial and industrial development is already fully or partially limited by regulation. Additionally, because no adverse effect is anticipated on industrial and shipping activities from restoration banks included in the Restoration Bank Credit Alternative, no cumulative adverse effects on these activities are anticipated.

Long term, there is the potential for restoration implemented under the Restoration Bank Credit Alternative combined with restoration implemented for other purposes to have long-term moderate beneficial socioeconomic impacts from the array of ecological services and social benefits that healthy habitats and natural resources provide, particularly in an urban and industrial setting such as Portland Harbor.

5.3.3 Cultural and Historic Resources

The cumulative impacts to cultural and historic resources are anticipated to be consistent with the individual project impacts described in Section 5.1.3. Regardless of what program a project is being implemented under, project proponents are required to consult with the SHPO and the tribes and to conduct investigations to identify cultural and historic resources subject to Section 106 of the NHPA. Restoration projects are generally designed to avoid impacts to cultural and historic resources if the

resources are found in the Restoration Service Area. Restoration actions are also anticipated to have long-term beneficial impacts to habitat for culturally significant fish, such as salmon, lamprey, and sturgeon. Cumulatively, old industrial uses such as lumber mills may become more common places for siting restoration projects due to locations along the river, inactivity, lack of redevelopment potential, and parcel size. Removal of mill buildings and other timber industry infrastructure may represent moderate, adverse long-term impacts to these potential historic resources. Through consultation with the appropriate authorities such as SHPO, mitigation for the impacts to potential cultural and historic resources is required.

5.3.4 Energy

There are no anticipated cumulative impacts from the Restoration Bank Credit Alternative because there are no energy effects anticipated from the federal action.

5.3.5 Geologic and Soil Resources

Expected direct short-term impacts would include soil disturbance caused by grading, excavation, and soil removal during project implementation. Erosion has been or would be controlled through best management practices at individual restoration banks. All banks and other projects would be required to comply with removal/fill permits. The restoration banks in the Restoration Bank Credit Alternative and those implemented under similar plans would not occur all at the same time (in fact, some have already occurred), so short-term impacts are expected to be isolated and relatively small. No significant cumulative short-term impacts are expected.

5.3.6 Recreation

The included restoration banks, along with other similar plans and actions, could have a cumulative beneficial impact on some types of recreation in the long term, including boating, fishing, and wildlife viewing. Improved aesthetics would improve recreational boating and wildlife viewing, while fish health improvements could improve recreational fishing. As implemented and/or planned, public access to the restoration bank sites is restricted, but given the size of the project area outlined in the Programmatic Restoration Plan, and uncertainty about all future restoration locations, it is unlikely this would be a cumulatively significant effect.

Short-term adverse impacts include temporary access restrictions to any future projects where public access is permitted, adverse aesthetic impacts, noise, and construction debris that would negatively affect recreation. However, again, the restoration banks in the Restoration Bank Credit Alternative and those projects implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated and relatively small.

5.3.7 Transportation, Utilities, and Public Services

Minor transportation detours and delays could be caused by implementation of restoration projects. However, the banks included in the Restoration Bank Credit Alternative and those implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated and relatively small.

5.3.8 Wetlands

Short-term disturbance from construction activities may adversely impact wetlands if any are present at restoration sites. The impacts include soil disturbance, temporary vegetation displacement, and noise disturbance. Any short-term disturbance within wetlands under these projects is designed to provide long-term benefit, and all projects would be in compliance with Section 404 of the CWA. Additionally, the projects implemented under this Final Supplemental Restoration Plan and those implemented under similar plans would likely not occur all at the same time, so short-term impacts are expected to be isolated and relatively small. There are no cumulatively significant long-term adverse impacts anticipated to wetlands.

Implementation of this Final Supplemental Restoration Plan could contribute to cumulative long-term benefits to wetland habitats if multiple programs improve wetland habitat.

5.3.9 Biological Resources

Short-term construction activities could cause temporary adverse effects to biological resources through increased turbidity, noise, and reduced air quality. Construction has been and/or would be implemented in a manner that avoids short-term effects as much as possible using best management practices. The banks included in the Restoration Bank Credit Alternative and those implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated and relatively small.

The existing and planned restoration banks have prioritized actions that would have major local long-term beneficial impacts by improving fish and other species' habitat structure and function and, therefore, provide major benefit to these species with increased habitat quantity and quality. There is potential for major beneficial cumulative impacts to biological resources and federally listed species, especially in combination with other similar programs that improve similar resources throughout the Restoration Service Area.

5.3.10 Public Health and Safety

5.3.10.1 Air Quality

Adverse air quality impacts on a cumulative basis would be limited to short-term increases in dust and construction equipment emissions. Projects have or would minimize effects through the use of best management practices for operations. The banks included in the Restoration Bank Credit Alternative and those implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated and relatively small. It is not anticipated that cumulatively significant impacts to air quality would occur.

5.3.10.2 Climate

Restoration banks included in the Restoration Bank Credit Alternative and projects implemented under similar plans are not anticipated to have any cumulative effect on production of emissions that are believed to affect climate. However, to the extent that restoration banks and other projects increase shoreline resiliency (through restoration of riverbanks and riparian areas) and increase flood storage and floodplain connectivity (by removing infrastructure from the shoreline and floodplain, allowing for

inundation of off-channel habitats), they may help support the resiliency of the ecosystem and reduce the susceptibility of infrastructure and property to the effects of climate change.

5.3.10.3 Environmental Health and Noise

Short-term increases in noise from construction activity would not be cumulatively significant given the background noise levels already present along much of the lower Willamette River. Environmental health risks have been or would be limited by the use of appropriate on-site construction plans. The restoration banks included in the Restoration Bank Credit Alternative and those projects implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated and relatively small. No significant cumulative effects are anticipated.

5.3.10.4 Floodplain and Flood Control

The beneficial impacts of improving and/or increasing the amount of floodplain habitat and connectivity could have a beneficial cumulative impact in the Restoration Service Area if other restoration plans include this type of work. The benefits include stabilizing riverbanks, controlling erosion and sedimentation, improving water quality by filtering pollutants, and increasing storage capacity. However, whether future projects would include a floodplain habitat and connectivity component is unknown, so the cumulative impact is unknown.

5.3.10.5 Water Quality

Water quality impacts are expected to be minimal and limited to short-term increases in turbidity where in-water work is part of a restoration construction or maintenance activity. The restoration banks included in the Restoration Bank Credit Alternative and those projects implemented under similar plans would not occur all at the same time, so short-term impacts are expected to be isolated, relatively small, and not cumulative. Ongoing maintenance of vegetation at restoration projects often includes the use of herbicides, which may be occurring across multiple projects simultaneously. Best management practices for herbicide use include limitations on which products to use in sensitive habitats, specific application methods, distance from open water, and other strategies to limit adverse impacts. Cumulatively, the impacts may be minor and adverse in the short term. Long-term cumulative effects of habitat restoration to water quality are expected to be positive by reducing water temperatures and increasing runoff filtering which reduces terrestrial sediment and contaminant input.

5.4 Summary of Alternatives Analysis

The Trustee Council evaluated the environmental impacts of the Restoration Bank Credit Alternative and the No-Action Alternative. The analysis is summarized in Table 3. The Trustee Council concluded that the Preferred Alternative is the Restoration Bank Credit Alternative. This alternative is unlikely to have significant adverse impacts on the human environment in accordance with the guidelines for determining the significance of proposed federal actions (43 C.F.R. § 1508.27). Therefore, NOAA has issued a Finding of No Significant Impact (FONSI) with this Final SRP/EA. This alternative would meet the mandates under NRDA statutes and regulations to restore natural resources and services injured by releases of hazardous substances and discharges of oil and is consistent with the goals and objectives outlined in the Programmatic Restoration Plan.

Table 3. Summary of Environmental Impact Analysis for the No-Action and Restoration Bank Credit Alternatives

Resource Area	Term	No-Action	Restoration Bank Credits
Land Use	Short	None	Minor (-)
	Long	None	Minor (-) and (+)
Shoreline Use	Short	None	Minor to moderate (-)
	Long	None	Minor to moderate (+)
Aesthetics	Short	None	Minor to moderate (-)
	Long	None	Minor to moderate (+)
Socioeconomics	Short	None	None to minor (-) and (+)
	Long	None	None to moderate (-) and (+)
Cultural and Historic Resources	Short	None	None
	Long	None	Minor to moderate (-)and (+)
Energy	Short	None	None
	Long	None	None
Geologic and Soil Resources	Short	None	Minor (-)
	Long	None	Minor (+)
Recreation	Short	None	Minor (-)
	Long	None	Minor to moderate (-) and (+)
Transportation, Utilities, and Public Services	Short	None	Minor (-)
	Long	None	None
Wetlands	Short	None	Minor (-)
	Long	None	Minor to moderate (+)
Biological Resources (including federally listed species)	Short	None	Minor (-)
	Long	None	Major (+)
Air Quality	Short	None	Minor (-)
	Long	None	Minor (+)
Climate	Short	None	Minor (-)
	Long	None	Minor (+)
Environmental Health and Noise	Short	None	Minor (-)
	Long	None	Minor (+)
Floodplain and Flood Control	Short	None	Minor (-)
	Long	None	Minor (+)
Water Quality	Short	None	Minor (-)
	Long	None	Minor to moderate (+)

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6. COORDINATION AND CONSULTATION

This section provides a review of the applicable laws and regulations that may affect the Trustee Council's restoration actions. Portland Harbor restoration would need to comply with federal, state, tribal, and local laws and regulations. There are also several permitting requirements associated with many of these laws and regulations, and the Trustee Council along with project managers would need to be sure that there is coordination across these programs so that all restoration project implementation and monitoring complies with applicable laws and regulations.

6.1 Comprehensive Environmental Response, Compensation, and Liability Act

CERCLA, 42 U.S.C. §§ 9601 *et seq.* provides a legal framework for addressing injuries to the nation's natural resources resulting from releases of hazardous substances. CERCLA, also known as the Superfund Act, establishes liability for injury to, destruction of, loss of, or loss of use of natural resources caused by the release of hazardous substances and authorizes recovery of natural resource damages for such injuries. Natural resource trustees are responsible, under CERCLA, for restoring, rehabilitating, replacing, or acquiring the equivalent of natural resources injured by hazardous substance releases and losses of services provided by those natural resources. CERCLA also establishes a hazard ranking system known as the National Priorities List for assessing and responding to the most contaminated sites from the list as the primary priority. CERCLA should also be considered in conjunction with the OPA and the National Oil and Hazardous Substances Pollution Contingency Plan (National Contingency Plan).

6.2 Oil Pollution Act

The OPA of 1990, 33 U.S.C. §§ 2701 *et seq.*; is a federal law that provides for the prevention of, liability for, removal of, and compensation for the discharge or the substantial threat of discharge of oil into or upon the navigable waters of the United States, adjoining shorelines, or the Exclusive Economic Zone. Through Section 1006(e), the President is required to act through the Under Secretary of Commerce for Oceans and Atmosphere to establish procedures for natural resource trustees in the assessment of damages for injury to, destruction of, loss of, or loss of use of natural resources covered by OPA. This section also provides for the designation of natural resource trustees, who may be federal, state, Indian tribes, or foreign to determine resource injuries, assess natural resources damages, present a claim, recover damages, develop and implement a plan for restoration, rehabilitation, replacement, or acquisition of the equivalent of the natural resources under their trusteeship.

6.3 National Environmental Policy Act

NEPA) requires federal agencies to evaluate potential environmental effects of any major planned federal action and promotes public awareness of potential impacts by requiring federal agencies to prepare an environmental evaluation for any major federal action affecting the human environment. As lead federal agency for this analysis under NEPA, NOAA has prepared the Programmatic Restoration Plan and this Final Supplemental Restoration Plan to evaluate alternative restoration planning approaches. USFWS is a cooperating agency, and state and tribal members of the Trustee Council were also involved in developing this document. This document helps to determine and disclose whether the

Preferred Alternative (Restoration Bank Credit Alternative) would have a significant effect on the quality of the human environment.

6.4 Endangered Species Act

The ESA provides for the conservation of endangered and threatened species of animals and plants, and the habitats in which they are found. The ESA is administered jointly by NOAA and the USFWS. Section 7 of the ESA requires that federal agencies proposing an action consult with these agencies (NOAA and USFWS) if the proposed action may affect endangered and threatened species or destroy or adversely modify designated critical habitat. The Section 7 consultation and regulatory permits are designed to prevent or mitigate any disturbances to federally listed threatened or endangered species. For projects included in the Preferred Alternative, any required consultations have either taken place or would take place prior to implementation.

6.5 Magnuson-Stevens Fishery Conservation and Management Act

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) requires consultation for federal agency actions that may adversely affect Essential Fish Habitat (EFH), which is defined to include “those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity” (62 Fed. Reg. 66551, § 600.10 Definitions). The National Marine Fisheries Service (NMFS), under Section 305(b)(4) of the MSA, is required to provide advisory conservation and enhancement recommendations to federal and state agencies for actions that adversely affect EFH. Consultations may be combined with ESA Section 7 consultations to address both ESA and MSA. For each project included in the Preferred Alternative, where applicable, NMFS has either been or would be consulted regarding any MSA-managed species that use the proposed project locations for some or all of their life stages.

6.6 Clean Water Act

The CWA, 33 U.S.C. § 1251 is the principal law governing pollution control and water quality of the nation’s waterways. It requires the establishment of guidelines and standards to control the direct or indirect discharge of pollutants to waters of the United States. Discharges of *any* material into navigable waters are regulated under Sections 401 and 404 of the CWA. The USACE has the primary responsibility for administering the Section 404 permit program. Under Section 401, projects that involve discharge or fill to wetlands or navigable waters must obtain certification of compliance with state water quality standards. The projects included in the Preferred Alternative have been or would be required to obtain authorization from the USACE under Section 404 of the CWA, which generally also involves a full NEPA impacts analysis. State and local requirements, including state water quality certification under Section 401 of the CWA, and local planning and zoning ordinances, may also apply.

6.7 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) requires other state and federal agencies to consult with USFWS and NMFS in a broad range of situations to help conserve fish and wildlife populations and habitats. As required by the FWCA, the Federal Trustees are in close coordination on all aspects of the Portland Harbor NRDA, including restoration project selection.

6.8 Oregon Environmental Protection Act

The Oregon Environmental Protection Act “ensures that the federal environmental standards of the Clean Air and Clean Water Acts that were in place and effective as of January 19, 2017...shall remain in effect and be enforceable under state law even if the federal government rolls back these standards.” (Brown 2018). This act extends CWA protections to rivers and streams where jurisdictions were unclear under federal law to clarify that the Clean Water Rule (waters of the U.S.) protects waterways in Oregon, except in the cases of existing pre-exemptions for agricultural areas such as ditches or fields. The restoration banking projects included in the Preferred Alternative have been or would be conducted in compliance with this act.

6.9 Rivers and Harbors Act

The Rivers and Harbors Act, 33 U.S.C. §§ 401, *et seq.* regulates the development and use of navigable waterways within the United States. Section 10 of this act prohibits unauthorized obstruction or alteration of navigable waters. It gives USACE the authority to regulate discharges of fill and other materials into such waters. Actions that require Section 404 CWA permits are also likely to require permits under Section 10 of this act, and permits may be required for some of the in-water work at the restoration banking projects included in the Preferred Alternative.

6.10 Executive Order 11514 (35 FR 4247) – Protection and Enhancement of Environmental Quality

This Executive Order directs federal agencies to monitor, evaluate, and control their activities in order to protect and enhance the quality of the nation’s environment; to inform and seek the views of the public about these activities; to share data gathered on existing or potential environmental problems or control methods; and to cooperate with other governmental agencies. The release of this Final Supplemental Restoration Plan and the types of projects envisioned under the Preferred Alternative are consistent with the intent of this order. This Final Supplemental Restoration Plan is the product of intergovernmental cooperation and will protect and enhance the environment. The restoration planning process has provided and continues to provide the public with information about the restoration efforts.

6.11 Executive Order 11988 (42 FR 26951) – Floodplain Management

This order, issued by President Carter on May 24, 1977, requires each federal agency to provide opportunity for early public review of any plans or proposals for actions in floodplains, in accordance with Section 2(b) of Executive Order 11514, as amended, including the development of procedures to accomplish this objective.

6.12 Executive Order 11990 (42 FR 26961) – Wetland Management

This order, issued by President Carter on May 24, 1977, requires each agency to provide opportunity for early public review of any plans or proposals for new construction in wetlands, in accordance with

Section 2(b) of Executive Order 11514, as amended, including the development of procedures to accomplish this objective.

6.13 Executive Order 12898 (59 FR 7629) – Environmental Justice, as Amended

This order, issued by President Clinton On February 11, 1994, 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. EPA and CEQ have emphasized the importance of incorporating environmental justice review in the analyses conducted by federal agencies under NEPA and of developing mitigation measures that avoid disproportionate environmental effects on minority and low-income populations.

The Trustee Council has not identified any disproportionate adverse impacts to human health or environmental effects of implementation of the restoration banking projects on Native Americans or other minority or low-income populations, and it believes that these projects would be beneficial to these communities.

6.14 Presidential Memorandum: Mitigating Impacts on Natural Resources from Development and Encouraging Related Private Investment

This memorandum, implemented in 2015, states the importance of mitigating adverse impacts to land, water, wildlife, and other ecological resources. It emphasizes the need for clear and consistent approaches to avoid and minimize adverse impacts and provide for compensatory mitigation.

6.15 Information Quality Guidelines Issued Pursuant to Public Law 106-554

Information disseminated by federal agencies to the public after October 1, 2002, is subject to information quality guidelines developed by each agency pursuant to Section 515 of Public Law 106-554 that are intended to ensure and maximize the quality of such information (i.e., the objectivity, utility, and integrity of such information). This Final Supplemental Restoration Plan is an information product covered by the information quality guidelines established by NOAA and DOI for this purpose. The information collected herein complies with applicable guidelines.

6.16 Executive Order 13007 (61 FR 26771) – Indian Sacred Sites, and Executive Order 13175 (65 FR 67249) – Consultation and Coordination with Indian Tribal Governments

Executive Order 13007 describes federal policy for accommodating sacred Indian sites. This Executive Order requires federal agencies with statutory or administrative responsibility for managing federal lands to (1) accommodate access to and ceremonial use of Indian sacred sites by Indian religions' practitioners; (2) avoid adversely affecting the physical integrity of such sacred sites; and 3) maintain the

confidentiality of these sacred sites. Executive Order 13175 exists to (1) promote regular and meaningful consultation and collaboration with tribal officials in the development of federal policies that have tribal implications; (2) strengthen the United States government-to-government relationships with Indian tribes; and (3) reduce the imposition of unfounded mandates upon Indian tribes. As part of the planning process for individual projects, appropriate coordination with federally recognized Indian tribes would be conducted, including those tribes on the Trustee Council that were involved in preparation of this document.

6.17 Executive Order 12962 (60 FR 30769) – Recreational Fisheries

This Executive Order directs federal agencies to, among other things, foster and promote restoration that benefits and supports viable, healthy, and sustainable recreational fisheries. The restoration projects that have been or would be built under the Preferred Alternative would benefit recreational fish species and their prey.

6.18 Executive Order 13112 (64 FR 6183) – Invasive Species

The purpose of Executive Order 13112 is to prevent the introduction of invasive species, provide for their control, and minimize the economic, ecological, and human health impacts that invasive species cause. No invasive species have been or would be intentionally introduced by any restoration banking project included in the Preferred Alternative. In addition, these projects are required to follow best management practices to avoid such introduction and to follow rigorous monitoring plans to document invasive species on the project sites.

6.19 Other Potentially Applicable Federal, State, Tribal, and Local Laws That May Influence Regulatory Processes and Management of the Restoration Sites

- Clean Air Act as amended, 42 U.S.C. §§ 7401, *et seq.*
- NHPA, 16 U.S.C. §§ 470, *et seq.*; Section 106 of the NHPA protects cultural and historic resources.
- Oregon statutes that protect archaeological sites on both private and public lands (see Oregon Revised Statute [ORS] Chapter 358, ORS 390.235, ORS 390.237, ORS 390.240, ORS 97.740-97.760, ORS 97.990, and OAR 736-051-0000-0090).
- Marine Mammal Protection Act, 16 U.S.C. §§ 1361, *et seq.*
- Shoreline Management Act, Ch. 90.58 RCW and Ch. 173-14 WAC.

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Appendix A

Natural Resource Damage Assessment Restoration Request for Proposals



PORTLAND HARBOR
Natural Resource Trustee Council



**Portland Harbor Natural Resource Trustee Council
Natural Resource Damage Assessment Restoration
Request for Proposals**

Background

The Portland Harbor Natural Resource Trustee Council (Trustee Council) consists of federal, state, and tribal natural resource trustees that are acting under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) to assess injuries to natural resources in the Portland Harbor Superfund Study Area (Study Area) resulting from unpermitted releases of hazardous substances. As part of the natural resources damage assessment and restoration (NRDAR) provisions laid out under CERCLA, the Trustee Council is also charged with identifying and evaluating natural resource restoration actions that could compensate the public for harm to the injured resources. This assessment and restoration work is distinct from the remedial (i.e., clean-up) process. The restoration planning process culminates in a publicly-vetted restoration plan outlining the Trustee Council’s preferred restoration alternative.

In 2017 the Trustee Council published the final version of the Portland Harbor Programmatic Environmental Impact Statement and Restoration Plan (PEIS/RP), which focuses specifically on restoration to compensate for ecological injuries resulting from releases of hazardous substances (compensation for other types of injuries, such as to human use, will be dealt with separately). That document can be found online at https://www.fws.gov/portlandharbor/sites/default/files/2018-12/201706_FINAL_PEIS.pdf (this is Volume 1 of the PEIS/RP; Volume 2 contains the appendices and is found at https://www.fws.gov/portlandharbor/sites/default/files/2018-12/201706_FINAL_PEIS_Appendix.pdf). The Final PEIS/RP evaluates several alternatives and outlines the Trustee Council’s preferred alternative for restoring natural resources injured by contamination in Portland Harbor: Integrated Habitat Restoration. Integrated Habitat Restoration focuses on the habitat needs shared by multiple fish and wildlife species potentially injured by hazardous substances released into and from the Portland Harbor Superfund Site, with a particular focus on juvenile Chinook salmon. The Final PEIS/RP describes the preferred alternative for restoration in broad terms, but also lays out in detail a process by which the Trustee Council will select specific restoration projects and the criteria by which they will be evaluated.

In the future, the Trustee Council anticipates having NRDAR settlement funds available for restoration. In the Final PEIS/RP, the Trustee Council explains that when settlement funds become available, the Trustee Council will evaluate options for converting those funds to ecological benefits, in this case quantified in terms of the ecological “credits” generated by a restoration project, or “restoration credits.” Options outlined in the Final PEIS/RP include:

- *Trustee-led restoration project implementation*, where the Trustee Council would use settlement funds to design and construct a restoration project themselves;
- *Partnering with non-Trustee entities who are implementing restoration*, where the Trustee Council would provide settlement funds to a third-party entity proposing to develop and implement a restoration project; and
- *Purchasing credits from restoration banks*, where the Trustee Council would purchase ecological benefits, in the form of credits, from a restoration bank.

The Trustee Council now intends to evaluate these three options as alternatives to determine which type of restoration arrangement will best meet the goals and objectives identified in the Final PEIS/RP, and generate a list of eligible projects.

Request for Project Proposals

Consistent with the Final PEIS/RP, and to support development of the forthcoming Supplemental Restoration Plan (SRP), the Trustee Council invites proposals for ecological restoration projects representing any of the three options described above (i.e., Trustee-led, partnership, or restoration bank) within the Portland Harbor Superfund Study Area and Broader Focus Area (Figure 1) that will restore, or are in the process of restoring, key habitat types and benefit potentially injured natural resources, such as juvenile Chinook salmon, Pacific lamprey, bald eagle, mink, and others. To develop this analysis, the Trustee Council will review specific projects representing each of these alternatives to better understand the benefits and challenges of each alternative. Proposed projects must meet all of the eligibility criteria described below in Part B. The Trustee Council will then evaluate eligible proposals based on the selection criteria described in detail in the Final PEIS/RP and outlined below in Part C.

The alternatives will be analyzed, described, and published for public comment in a SRP. The analysis will identify a preferred alternative or alternatives (i.e., Trustee Council-led restoration project implementation, partnering with other entities who are implementing restoration, and purchasing credits from restoration bank projects), along with a list of projects that best meet the Trustee Council's requirements. The SRP will guide how the Trustee Council spends its first infusion of settlement funds recovered through the NRDAR. If additional settlement funds become available in the future, the Trustee Council may continue to rely on this SRP, issue another request for project proposals, or consider other restoration alternatives. Also, any eligible restoration project proposals that are submitted for the Trustee Council's consideration during this request for proposals may be added to the Trustee Council's restoration portfolio for consideration in the future.

Instructions to Respondents

Each submitted project proposal should adhere to the following outline:

- A. Project overview
- B. Demonstration of Eligibility
- C. Documentation of Evaluation Standards

The information that should be included within each section is outlined below. Respondents should address each of the identified components in the order presented. In the event that a topic has been addressed previously (e.g., description of an eligibility criteria also responds to an evaluation standard), respondent should refer the reader to the section containing the relevant response (i.e., do not duplicate responses).

A. Project Overview

1. Project Name
2. Project Implementer
3. Project Category (Trustee-implemented project, partnership with a third party, or restoration bank).

B. Eligible Projects

To be eligible for consideration by the Trustee Council for funding, the proposed project must meet all of the following criteria. Please provide a description of how your proposed project addresses each of the identified criteria.

1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council’s restoration goals outlined in the Final PEIS/RP.
2. The project must meet one or more of the Trustee Council’s restoration goals, as stated in the Final PEIS/RP:
 - Move toward normative hydrology;
 - Restore floodplain function;
 - Reestablish floodplain and riparian plant communities;
 - Improve aquatic and riparian habitat conditions;
 - Improve river margin habitat; and
 - Restore habitat that provides ecological value in the landscape perspective.
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration (Figure 1).
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.
5. The proposed project’s habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council’s Habitat Equivalency Analysis and defined here: https://www.fws.gov/portlandharbor/sites/default/files/documents/HabTermsHEA_0967.pdf. The goal of this requirement is to ensure that the Trustee Council is able to quantify the ecological benefit of all projects using a common metric.

6. The proposed project's physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council's preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee Council's monitoring and stewardship framework. The Trustee Council's monitoring requirements and example performance criteria are detailed in Appendix D of the Final PEIS/RP (Volume 2), available here: https://www.fws.gov/portlandharbor/sites/default/files/2018-12/201706_FINAL_PEIS_Appendix.pdf
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.
9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes. Credits cannot be double-counted or be used to satisfy multiple legal obligations. For example, if a restoration bank is providing credits for both natural resource damages liability and for wetlands mitigation under Section 404 of the Clean Water Act there must be a clear accounting mechanism in place to ensure that each credit is only used once.
10. For projects that are not restoration banks, the proposed project is ineligible if it would be implemented regardless of the Portland Harbor NRDAR. For example, a proposed project would be ineligible if the entire project is required to satisfy some non-NRDAR legal obligation of the implementer (e.g., a project proponent that needs to conduct the project for Section 404 mitigation credits). This would result in double-counting of credits. Another example is a proposed project that would have been implemented by a government agency using public funds.

If a proposed project meets the eligibility criteria in Part B above, The Trustee Council will further evaluate the project using the selection criteria described in Part C below.

C. Selection Criteria

In evaluating responses to this request, the Trustee Council will consider which restoration alternative (i.e., Trustee-led project, partnership with a third-party, or purchase credits from a restoration bank), and which specific restoration projects best meet its restoration objectives and criteria, as described in the Final PEIS/RP. A detailed description of the Trustee Council's restoration objectives and selection criteria can be found in the Final PEIS/RP, Sections 5 and 7. The section below outlines the standards the Trustee Council will use to evaluate proposed

projects. The respondent should provide a written response to each of the evaluation standards identified below. In the event that a particular question has been addressed under a previous section of the proposal, please refer the reader to the appropriate section.

Developer Qualifications and Project Status

1. Project Proponent, including description of project proponent's qualifications and capacity;
2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already implemented).

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for restoration? Specify which.
4. Provide a map of the proposed project area.

Ecological Benefits

5. Describe the proposed project's ecological goals and objectives.
6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each. See section 5 of the Final RP/PEIS for a list of the Trustee Council's key habitat types
7. Describe how the proposed project's ecological benefits can be quantified. A discounted service acre year (DSAY) metric is preferred, but not required. More information on DSAYs is available at <https://darrp.noaa.gov/economics/habitat-equivalency-analysis>.
8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.
9. Describe how the proposed project site's ecological benefits will be permanently legally protected.
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.
11. Describe the proposed project implementer's plans for long-term stewardship for the proposed project.

Social Constraints/Feasibility

12. Provide an estimate of the proposed project's cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.

13. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.
14. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.
15. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.
16. Describe the proposed project's land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project's physical footprint.
17. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates). The Trustee Council is required to make all documents on selected projects available to the public.

Rare and Unique Opportunities

18. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?
19. Is the proposed project area under immediate threat of development or other non-restoration action that would preclude future restoration of the site?

Submission Guidelines

Please send responses to this request for proposals to portlandharbor.nrda@gmail.com, no later than 5:00 p.m. PST, March 2, 2020. Submissions must meet the following technical guidelines:

- The written portion of proposals (excluding drawings, graphics, photos, etc.) cannot exceed 15 pages of 12 point Times New Roman font, single-spaced.
- If available, the proposals should include designs, conceptual drawings, photos, or other materials that will help the Trustee Council evaluate the project. Up to 10 pages of additional materials may be provided, in addition to the maximum of 15 pages of written material.
- Proposals must provide sufficient information for the Trustee Council to fully evaluate the degree to which the proposed project meets the eligibility criteria and evaluation standards discussed above.
- Proposals must be submitted in PDF format.
- Total file size of all electronic materials submitted may not exceed 25 MB.

Questions

Any questions about this request for proposals must be sent to portlandharbor.nrda@gmail.com by January 31, 2020. By February 14, 2020, the Trustee Council will respond in writing to all questions by means of a combined document posted on the Trustee Council's website: <https://www.fws.gov/portlandharbor/>

Next Steps

Responses to this request for proposals will be evaluated solely on the materials submitted, and no additional information will be solicited during the application or review periods to fill gaps within the proposal. After evaluating the submissions, the Trustee Council anticipates publishing a draft SRP that will propose one or more preferred restoration alternatives (i.e., Trustee Council-led restoration project implementation, partnering with other entities who are implementing restoration, and purchasing credits from restoration bank projects), and identify those projects that may receive restoration funding. After consideration of public comments on the draft SRP, the Trustee Council anticipates publishing a final SRP. The Trustee Council may ultimately request additional information from the project(s) included under the preferred alternative.

Disclaimer

This request for proposals is not a commitment of funds. The Trustee Council is not required to purchase credits or further develop restoration concepts submitted in response to this request for proposals. Inclusion of a submitted project under the preferred alternative(s) within the final SRP does not guarantee that the proposed project will be funded by the Trustee Council.

This request for proposals does not void the Trustee Council's "restoration pause" described in the following memorandum:

https://www.fws.gov/portlandharbor/sites/default/files/documents/Restoration_Message.pdf

All materials submitted in response to this request for proposals will be considered public information and may be made available to the public through the SRP or other means.



Figure 1. Map of the Trustee Council's Restoration Focus Area

Appendix B
Restoration Bank Proposal Evaluations



Portland Harbor Restoration Committee Review of RFP Responses

Project Category	Alder Creek Restoration Project
	Heron Pacific, LLC (Wildlands)/Portland Harbor Holdings II, LLC
	Restoration bank

B. Eligibility Criteria

B. Eligibility Criteria	YES/NO	NOTES
1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council’s restoration goals outlined in the Final PEIS/RP.	Yes	
2. The project must meet one or more of the Trustee Council’s restoration goals, as stated in the Final PEIS/RP: o Move toward normative hydrology; o Restore floodplain function; o Reestablish floodplain and riparian plant communities; o Improve aquatic and riparian habitat conditions; o Improve river margin habitat; and o Restore habitat that provides ecological value in the landscape perspective.	Yes	
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration	Yes	Superfund Study Area
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.	Yes	Construction 2014-2016
5. The proposed project’s habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council’s Habitat Equivalency Analysis	Yes	
6. The proposed project’s physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council’s preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.	Yes	Deed restriction in place, committed to conservation easement
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee Council’s monitoring and stewardship framework.	Yes	
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.	Yes	
9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes. Credits cannot be double-counted or be used to satisfy multiple legal obligations.	Yes	

C. Selection Criteria**NOTES****Developer Qualifications and Project Status**

1. Project Proponent, including description of project proponent's qualifications and capacity;
2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already implemented).

Yes	Experience with 90 restoration projects, including NRDA banks
Constructed	Working towards meeting performance standards

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for restoration? Specify which.
4. Provide a map of the proposed project area.

Yes	Superfund Study Area
Yes	

Ecological Benefits

5. Describe the proposed project's ecological goals and objectives.
6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each.
7. Describe how the proposed project's ecological benefits can be quantified.
8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.
9. Describe how the proposed project site's ecological benefits will be permanently legally protected.
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.
11. Describe the proposed project implementer's plans for long-term stewardship for the proposed project.

Consistent with PEIS/RP	Ecological goals and objectives of the project are consistent with Trustee Council's PEIS/RP
Consistent with PEIS/RP	Demonstrated in figures 3a and 3b
HEA/DSAYs	
Consistent with PEIS/RP	Baseline and implementation monitoring complete, effectiveness monitoring ongoing
Consistent with PEIS/RP	Deed restriction in place, committed to conservation easement
Consistent with PEIS/RP	Maintenance and management ongoing
Consistent with PEIS/RP	

Social Constraints/Feasibility

1. Provide an estimate of the proposed project’s cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.
2. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.
3. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.
4. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.
5. Describe the proposed project’s land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project’s physical footprint.
6. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates).

Provided	Estimated cost per DSAY
Meets Trustee Council expectations	
Not an ongoing feasibility constraint	
Uses sufficiently restricted	
Meets Trustee Council expectations	
Public information available	

Rare and Unique Opportunities

7. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?
8. Is the proposed project area under immediate threat of development or other non-restoration action that would preclude future restoration of the site?

Yes	
No	Site previously developed, then restored

Portland Harbor Restoration Committee Review of RFP Responses

A. Project Overview

Project Name	Linnton Mill Restoration Site
Project Implementer	Linnton Water Credits, LLC (LWC)
Project Category	Restoration bank

B. Eligibility Criteria

1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council’s restoration goals outlined in the Final PEIS/RP.
2. The project must meet one or more of the Trustee Council’s restoration goals, as stated in the Final PEIS/RP:
 - o Move toward normative hydrology;
 - o Restore floodplain function;
 - o Reestablish floodplain and riparian plant communities;
 - o Improve aquatic and riparian habitat conditions;
 - o Improve river margin habitat; and
 - o Restore habitat that provides ecological value in the landscape perspective.
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.
5. The proposed project’s habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council’s Habitat Equivalency Analysis
6. The proposed project’s physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council’s preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.
9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes. Credits cannot be double-counted or be used to satisfy multiple legal obligations.

YES/NO	NOTES
Yes	
Yes	
Yes	Superfund Study Area
Yes	Constructed 2019, planting 2020
Yes	
Yes	Deed restriction and DSL lease in place, committed to conservation easement
Yes	
Yes	
Yes	Dual purpose bank (NRDA and 404 mitigation credits). Plan to track credit sales

C. Selection Criteria

NOTES

Developer Qualifications and Project Status

1. Project Proponent, including description of project proponent’s qualifications and capacity;
2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already

Yes	Over 15 years experience, including NRDA and long-term experience on the Willamette
Constructed	Working on obtaining TC approval of as-builts

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for restoration? Specify which.
4. Provide a map of the proposed project area.

Yes	Superfund Study Area
Yes	Figure 1

Ecological Benefits

5. Describe the proposed project’s ecological goals and objectives.
6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each.
7. Describe how the proposed project’s ecological benefits can be quantified.
8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.
9. Describe how the proposed project site’s ecological benefits will be permanently legally protected.
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.
11. Describe the proposed project implementer’s plans for long-term stewardship for the proposed project.

Consistent with PEIS/RP	Ecological goals and objectives of the project are consistent with Trustee Council's PEIS/RP
Consistent with PEIS/RP	Provided in Table 1 and Figures 5a and 5b
HEA/DSAYS	
Consistent with PEIS/RP	Baseline monitoring complete, plan for implementation and effectiveness monitoring provided in Table 2
Consistent with PEIS/RP	Deed restriction and DSL lease in place, committed to conservation easement
Consistent with PEIS/RP	Financial assurances in place
Consistent with PEIS/RP	Summary of anticipated long-term stewardship activities provided in Table 3

Social Constraints/Feasibility

1. Provide an estimate of the proposed project’s cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.
2. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.
3. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.
4. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.
5. Describe the proposed project’s land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project’s physical footprint.
6. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates).

Provided	Total project cost. Cost per DSAY could be calculated.
Meets Trustee Council expectations	
Not an ongoing feasibility constraint	Remedial actions complete. Post-construction sampling completed. Long-term monitoring in place where appropriate.
Uses sufficiently restricted	Deed restriction in place and conditions constructed for compliance (e.g., fencing). Perimeter easement to City and planned pathway/overlook for recreational viewing.
Meets Trustee Council expectations	
Public information available	Responded to public concerns by reducing height of upland soil mound

Rare and Unique Opportunities

7. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?
8. Is the proposed project area under immediate threat of development or other non-restoration action that would preclude future restoration of the site?

Yes	
No	Site previously developed, then restored

Portland Harbor Restoration Committee Review of RFP Responses

A. Project Overview

Project Name	Miller Creek Restoration Project
Project Implementer	Portland Harbor Holdings III, LLC/Heron Pacific, LLC (Wildlands)
Project Category	Restoration bank

B. Eligibility Criteria

1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council's restoration goals outlined in the Final PEIS/RP.
2. The project must meet one or more of the Trustee Council's restoration goals, as stated in the Final PEIS/RP:
 - o Move toward normative hydrology;
 - o Restore floodplain function;
 - o Reestablish floodplain and riparian plant communities;
 - o Improve aquatic and riparian habitat conditions;
 - o Improve river margin habitat; and
 - o Restore habitat that provides ecological value in the landscape perspective.
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.
5. The proposed project's habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council's Habitat Equivalency Analysis
6. The proposed project's physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council's preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.
9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes.

YES/NO	NOTES
Yes	
Yes	
Yes	Superfund Study Area
Yes	Construction planned to complete by 2022
Yes	

C. Selection Criteria

NOTES

Developer Qualifications and Project Status

1. Project Proponent, including description of project proponent’s qualifications and capacity;
2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already

Yes	Experience with 90 restoration projects, including NRDA banks
Planning	Initial planning conducted, project on hold

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for restoration? Specify which.
4. Provide a map of the proposed project area.

Yes	Superfund Study Area
Yes	

Ecological Benefits

5. Describe the proposed project’s ecological goals and objectives.
6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each.
7. Describe how the proposed project’s ecological benefits can be quantified.
8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.
9. Describe how the proposed project site’s ecological benefits will be permanently legally protected.
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.
11. Describe the proposed project implementer’s plans for long-term stewardship for the proposed project.

Consistent with PEIS/RP	Ecological goals and objectives of the project are consistent with Trustee Council's PEIS/RP
Consistent with PEIS/RP	Demonstrated in figures 3 and 5
HEA/DSAYS	
Consistent with PEIS/RP	Baseline monitoring complete, implementation and effectiveness monitoring planned
Consistent with PEIS/RP	Deed restriction and conservation easement proposed
Consistent with PEIS/RP	Process proposed
Consistent with PEIS/RP	Process proposed

Social Constraints/Feasibility

1. Provide an estimate of the proposed project’s cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.
2. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.
3. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.
4. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.
5. Describe the proposed project’s land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project’s physical footprint.
6. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates).

Provided	Estimated cost per DSAY
Council expectations	Proposed
Unknown	Further evaluation required
Proposed restrictions sufficient	
Meets Trustee Council expectations	
Some public information available	

Rare and Unique Opportunities

7. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?
8. Is the proposed project area under immediate threat of development or other non-restoration action that would preclude future restoration of the site?

Yes	
Potentially	Portland Harbor Holdings III currently owns development rights, project not yet implemented

Portland Harbor Restoration Committee Review of RFP Responses

A. Project Overview

Project Name	Rinearson Natural Area
Project Implementer	Columbia Restoration Group
Project Category	Restoration bank

B. Eligibility Criteria

	YES/NO	NOTES
1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council's restoration goals outlined in the Final PEIS/RP.	Yes	
2. The project must meet one or more of the Trustee Council's restoration goals, as stated in the Final PEIS/RP: <ul style="list-style-type: none"> o Move toward normative hydrology; o Restore floodplain function; o Reestablish floodplain and riparian plant communities; o Improve aquatic and riparian habitat conditions; o Improve river margin habitat; and o Restore habitat that provides ecological value in the landscape perspective. 	Yes	
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration	Yes	Broader Focus Area
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.	Yes	Constructed 2017-2018
5. The proposed project's habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council's Habitat Equivalency Analysis	Yes	
6. The proposed project's physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council's preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.	Yes	
7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee Council's monitoring and stewardship framework.	Yes	Deed restriction in place, committed to conservation easement
8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.	Yes	
9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes. Credits cannot be double-counted or be used to satisfy multiple legal obligations.	Yes	

C. Selection Criteria

NOTES

Developer Qualifications and Project Status

1. Project Proponent, including description of project proponent’s qualifications and capacity;
2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already implemented).

Yes	Experience with multiple restoration projects nationwide
Constructed	Completing Year 1 monitoring at time of submittal

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for
4. Provide a map of the proposed project area.

Yes	Broader Focus Area
Yes	

Ecological Benefits

5. Describe the proposed project’s ecological goals and objectives.
6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each.
7. Describe how the proposed project’s ecological benefits can be quantified.
8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.
9. Describe how the proposed project site’s ecological benefits will be permanently legally protected.
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.
11. Describe the proposed project implementer’s plans for long-term stewardship for the proposed project.

Consistent with PEIS/RP	Ecological goals and objectives of the project are consistent with Trustee Council's PEIS/RP
Consistent with PEIS/RP	Demonstrated in Exhibits A and B
HEA/DSAYS	
Consistent with PEIS/RP	Baseline monitoring complete; implementation monitoring complete; effectiveness monitoring ongoing
Consistent with PEIS/RP	Deed restriction in place, committed to conservation easement
Consistent with PEIS/RP	Completing Year 1 monitoring at time of submission; effectiveness monitoring ongoing
Consistent with PEIS/RP	

Social Constraints/Feasibility

1. Provide an estimate of the proposed project’s cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.
2. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.
3. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.
4. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.
5. Describe the proposed project’s land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project’s physical footprint.
6. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates).

Provided	Estimated total project cost and cost per acre
Meets Trustee Council expectations	
No remedial action or ongoing contamination present on or adjacent to the project site.	
Uses sufficiently restricted	
Meets Trustee Council expectations	
Public information available	

Rare and Unique Opportunities

7. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?
8. Is the proposed project area under immediate threat of development or other non-restoration action that would preclude future restoration of the site?

Yes	
No	

Portland Harbor Restoration Committee Review of RFP Responses

A. Project Overview

Project Name	Harborton Habitat Development Project
Project Implementer	Portland General Electric
Project Category	Restoration bank

B. Eligibility Criteria

	YES/NO	NOTES
1. The proposed project must result in physical, on-the-ground restoration or improvement of those potentially injured natural resources identified in the Final PEIS/RP. Projects focused on providing other benefits such as public outreach, education, and recreation do not meet the Trustee Council's restoration goals outlined in the Final PEIS/RP.	Yes	
2. The project must meet one or more of the Trustee Council's restoration goals, as stated in the Final PEIS/RP: o Move toward normative hydrology; o Restore floodplain function; o Reestablish floodplain and riparian plant communities; o Improve aquatic and riparian habitat conditions; o Improve river margin habitat; and o Restore habitat that provides ecological value in the landscape perspective.	Yes	
3. The proposed project must be located within the Superfund Study Area or within the Broader Focus Area for restoration	Yes	Superfund Study Area
4. The proposed project must currently be generating ecological benefits or be expected to do so with a high degree of certainty within 2 years of the date of this request for proposals.	Yes	Construction anticipated to begin 2020
5. The proposed project's habitat conditions prior to restoration and the habitat conditions achieved after restoration must be clearly demonstrable geospatially, using the habitat types included in the Trustee Council's Habitat Equivalency Analysis	Yes	
6. The proposed project's physical footprint and its ecological benefits must ultimately have permanent legal protection. The Trustee Council's preferred method for providing these protections is a conservation easement deed preserving relevant ecological functions.		PGE (and the PUC) has agreed to place a Deed Restriction and eventually a Conservation Easement Deed over the Project.

7. The proposed project must be designed to meet reportable performance criteria that are relevant to Trustee Council goals and monitoring requirements. The project proponent must have conducted, or be willing to conduct, baseline, implementation, and a minimum of 10 years of effectiveness monitoring, consistent with the Trustee Council's monitoring and stewardship framework.

Yes	
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8. The proposed project must have a plan for long-term stewardship to ensure that the proposed project can be appropriately monitored and its ecological values maintained in perpetuity.

Yes	
-----	--

9. For restoration banks, credits used to resolve natural resource damages liability cannot be used for other purposes.

Yes	
-----	--

C. Selection Criteria

NOTES

Developer Qualifications and Project Status

1. Project Proponent, including description of project proponent's qualifications and capacity;

Yes	PGE is not personally experienced with restoration projects, but is highly familiar with the site. PGE contractors all have previous experience with restoration projects.
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2. Proposed project status (how much progress has been made in planning and/or implementation; projected date for completion of construction if not yet implemented; progress towards meeting performance criteria if already implemented).

Planning	Construction projected to begin in 2020
----------	---

Geographic Area

3. Is the proposed project located in the Portland Harbor Superfund Study Area or Broader Focus Area for

Yes	Superfund Study Area
-----	----------------------

4. Provide a map of the proposed project area.

Yes	
-----	--

Ecological Benefits

5. Describe the proposed project's ecological goals and objectives.

Consistent with PEIS/RP	
-------------------------	--

6. Describe the habitat types that exist before any restoration actions are taken (i.e., baseline) and the habitats that will be restored along with the acreage of each.

Consistent with PEIS/RP	
-------------------------	--

7. Describe how the proposed project's ecological benefits can be quantified.

HEA/DSAYs	
-----------	--

8. Describe the baseline, implementation, and effectiveness monitoring planned or underway at the proposed project site.

Consistent with PEIS/RP	Baseline monitoring complete; implementation and effectiveness monitoring to be conducted after construction
-------------------------	--

9. Describe how the proposed project site's ecological benefits will be permanently legally protected.	Consistent with PEIS/RP	Deed Restriction not yet recorded for the Project, conservation easement proposed
10. Describe how the proposed project will be managed and maintained during the 10 year performance period.	Consistent with PEIS/RP	Project implementer intends to be responsible for managing and maintaining the project during the performance period
11. Describe the proposed project implementer's plans for long-term stewardship for the proposed project.	Consistent with PEIS/RP	Process proposed

Social Constraints/Feasibility

1. Provide an estimate of the proposed project's cost per acre, per DSAY, or per other metric for which you have quantified benefits. Include a detailed accounting of the components included in your cost estimate.	Provided	Total project cost and cost per acre estimated
2. Describe any forms of financial assurance in place to secure costs associated with construction, adaptive management, and contingencies.	Meets Trustee Council Expectations	In progress
3. Describe any remedial action or ongoing contamination on or adjacent to the proposed project site.	Some Contamination Risk	Sampling plan in place with mitigation procedures if necessary
4. Describe how the proposed project will include or prohibit human uses from industrial/commercial, residential, and recreational activities.	Restrictions proposed	Public access to the property will be restricted
5. Describe the proposed project's land ownership, including a description of any easements or other uses that may impact current or future ecological function within the proposed project's physical footprint.	Meets Trustee Council Expectations	Property is privately owned and not open to the public; two easements over the property, both held by the same third-party corporation
6. Describe any existing or expected public support and involvement in the proposed project, or any specific challenges encountered, as well as public availability of information about the proposed project (including restoration plans, monitoring reports, and pertinent project updates).	Some public information available	

Rare and Unique Opportunities

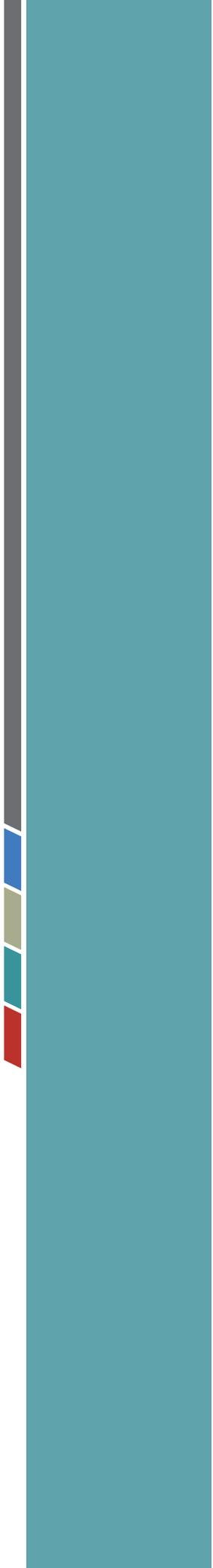
7. Does the proposed project represent an opportunity to protect or restore a unique, rare, or significant habitat type or feature within the geographic area?

Yes	
Potentially	Property zoned "Industrial"

8. Is the proposed project area under immediate threat of development or other non-restoration action that would

Appendix C

Public Comment on the Draft Portland Harbor Supplemental
Restoration Plan and Environmental Assessment



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PUBLIC COMMENT ON THE DRAFT PORTLAND HARBOR SUPPLEMENTAL RESTORATION PLAN AND ENVIRONMENTAL ASSESSMENT

The public comment period for the Draft Portland Harbor Supplemental Restoration Plan and Environmental Assessment (Draft SRP) opened on August 13, 2020, and closed on September 14, 2020.

During the public comment period, the Portland Harbor Natural Resource Trustee Council (Trustee Council) hosted a virtual public meeting on September 1, 2020. The presentation and video recording of that public meeting are available on the Trustee Council's website.¹

Public comments were accepted via email, and a mailing address was also provided. During the public comment period, the Trustee Council received eight submissions from private citizens, businesses, non-governmental organizations, and federal, state, and local agencies. Each submission was carefully read and individual comments within the submissions were delineated, resulting in 31 individual comments. The full submissions, including the delineated comments, are included in Appendix D.

All comments submitted during the period for public comment were reviewed and considered by the Trustee Council prior to finalizing this SRP. The individual comments were assigned a broad topic category to facilitate organizing and responding to the comments (see Table C-1).

Table C-1. Categories of Delineated Comments

Category	Delineated Comments
Alternatives	5
Contamination	1
Coordination and Consultation	7
Damage Calculation	4
Geographic Scope	2
Individual Restoration Site	2
Monitoring and Stewardship	3
Project Planning and Implementation	1
Public Participation	4
Recreation	2

¹ <https://www.fws.gov/portlandharbor/news/draft-supplemental-restoration-plan-available-comment>

RESPONSE TO COMMENTS

Below is a summary of the comments received by the Portland Harbor Natural Resource Trustee Council during the comment period and the Trustee Council's responses to those comments. Similar or related comments contained in the submissions have been grouped and summarized for purposes of this response.

C.1 Category – Alternatives

- C.1.1 Commenters expressed support for the Trustee Council's Preferred Alternative (Comments 010, 022, 024, and 031).

Response – The Trustee Council acknowledges and appreciates the comments in support of the Preferred Alternative.

- C.1.2 Commenters inquired about whether the Trustee Council considered alternatives other than the Restoration Credit Alternative, and whether other alternatives may be considered in the future (Comments 001 and 024).

Response – In the Draft SRP, the Trustee Council considered the Partnering Project Alternative, the Trustee-Led Project Alternative, and a Combined Alternative with some blend of restoration banking and third-party partnering projects. Despite the fact that the Trustee Council did not receive any responses to the request for proposals (included as Appendix A) in these categories, the Trustees did consider whether there might be partnering or Trustee Council-led projects that were not proposed but that might be appropriate for further consideration in the Draft SRP. Ultimately, the Trustee Council did not identify any projects that rose to the level of inclusion in this analysis. In the absence of specific proposals, the Trustee Council decided not to consider this alternative further.

In potential future restoration plans, the Trustee Council may choose to undertake such projects. This SRP will guide how the Trustee Council manages settlement compensation recovered through Phase 2 of the Natural Resource Damage Assessment (NRDA) process for the PHAA. If additional settlements occur in the future, the Trustee Council may continue to rely on the Final SRP, issue another request for project proposals, or consider other restoration alternatives. It is also worth noting that potentially responsible party (PRP) project implementation is not evaluated in the SRP. If a PRP-implemented restoration project is proposed as part of a Phase 2 settlement, a separate planning effort and environmental impact analysis would be completed by the Trustee Council for that potential project. Opportunity for public comment would be provided.

C.2 Category – Contamination

- C.2.1 Commenter expressed concern about potential impacts from the Superfund remedy to the natural resources and services (Comment 028).

Response – The Trustee Council shares the commenter's concerns with respect to the potential negative impacts to native species that may occur as a result of cleanup actions. The Trustee Council conducted its initial settlement-oriented damage assessment well in advance of the

selection of remedial actions by the US Environmental Protection Agency (EPA). At that time, the Trustee Council used conservative assumptions about cleanup action scenarios as inputs to our injury model. The use of these assumptions resulted in a calculation of injuries that is higher than would be the case for more aggressive cleanup scenarios. Thus, the amount of restoration required to compensate the public for lost ecological services is also higher.

As EPA gets closer to designing and implementing specific cleanup actions, the Trustee Council continues to work closely with EPA to ensure our concerns with respect to impacts to natural resources resulting from such actions are heard and understood. In instances where remedial actions have the potential to result in substantial natural resource damages, the Trustee Council may ultimately develop claims for such damages in future phases of the injury assessment. In addition, EPA is currently involved in pre-consultation on the remedy with the National Marine Fisheries Service (NMFS) and the US Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act. If needed, as part of this consultation NMFS and USFWS may require conservation measures to limit or mitigate for impacts to listed species and their habitat.

C.3 Category – Coordination and Consultation

- C.3.1 Commenter requested more information on specific permits or other regulatory requirements and how they apply to the restoration projects identified as eligible under the Preferred Alternative (Comments 011, 012, 013, 014, and 015).

Response – As described in Section 6 of the SRP (Coordination and Consultation), Portland Harbor restoration projects will comply with federal, state, tribal, and local laws and regulations. Neither the National Oceanic and Atmospheric Administration (NOAA) nor the Trustee Council are the applicant or lead agency for consultation or permitting on any of the individual restoration projects determined to be eligible under the preferred alternative as described in the SRP. Each of the restoration projects described in the SRP is managed and implemented by a private entity that is responsible for obtaining all permits and completing environmental compliance requirements. For the projects that have already been implemented or begun construction as of the writing of this response (Alder Creek, Harborton, Linnton Mill, and Rinearson), all required permits have been obtained by the project developers, as required (including Clean Water Act, consultations with the Tribes and State Historic Preservation Office, and others noted in Comments 011, 012, 013, 014, and 015).

- C.3.2 Commenter encouraged coordination between NOAA and EPA's Superfund Program (Comment 016).

Response – NOAA and the Trustee Council appreciate the encouragement of coordination with EPA and DEQ on restoration and remedial actions in the Portland Harbor Assessment Area (PHAA). The Trustee Council agrees this coordination is important to successful implementation of NRDA restoration and remedial activities. NOAA, US Department of the Interior, and EPA hold a monthly Portland Harbor federal coordination call where topics mentioned in this comment may be addressed. In addition, multiple members of the Trustee Council participate in the monthly Portland Harbor Technical Coordination Team (TCT) meetings with EPA and DEQ. The Trustee Council representatives use the TCT meetings as opportunities to identify areas for enhanced coordination to occur at the federal coordination calls or as needed for specific topics

(such as the Riverbanks Guidance). The Trustee Council plans to continue to rely on these existing opportunities for coordination and to encourage EPA to continue to bring concerns, comments, and questions for discussion as needed.

- C.3.3 Commenter expressed concern about potential double counting of NRDA restoration obligations to cover other mandates (Comment 027).

Response – The Trustee Council concurs that it is critical to prevent double counting in any action taken by a PRP to resolve NRDA liability. This prohibition is reflected in the Habitat Development Plans generated by project implementers and would also be included in any NRDA-related consent decree involving the Trustee Council and PRPs. For example, a restoration bank may be certified for NRDA credits, endangered species conservation credits, and wetlands mitigation credits. In this scenario, the developer is required to keep a ledger identifying each credit transaction, and once a credit has been used for one purpose, it is taken out of circulation. Therefore, if a credit has been purchased for NRDA purposes (for example), the purchaser could not then present it to a different government agency for credit against another ecological obligation, nor could a developer sell the same credit to two different parties for different ecological purposes.

C.4 Category – Damage Calculation

- C.4.1 Commenter inquired about how airborne contaminants were considered in the injury assessment (Comment 018).

Response – The Trustee Council appreciates the commenter’s concern for the impacts of vehicle pollutants to natural resources and services in the PHAA. Vehicle pollutants were indirectly considered in the Trustee Council’s Phase II injury assessment. This assessment relied primarily on sediment chemistry to quantify ecological injuries, and this evaluation took into consideration contaminant contributions from airborne sources, as well as other pathways. For example, the Trustee Council calculated ecological service losses associated with total polycyclic aromatic hydrocarbons (PAHs) in sediment. Vehicle emissions are a known source of total PAHs. Monitoring vehicle pollutants in the ambient air and implementing strategies for reducing vehicle pollutants are outside the scope of the NRDA process, as well as the Trustee Council’s statutory authorities.

- C.4.2 Commenter expressed concern with the Trustee Council’s methodology (see Section 2.1.5 of the SRP) for injury determination (Comments 019 and 020).

Response – The Trustee Council disagrees with the assertion that the Hylebos model is not appropriate for assessing service losses in the settlement-oriented phase (i.e., Phase 2) of the Portland Harbor NRDA process. While it would be feasible to develop a new suite of benchmarks and service loss thresholds for Portland Harbor, the amount of time, effort, and expense involved with such an effort would far exceed its utility in the settlement-oriented scope of Phase 2. While any new benchmarks may add some degree of fidelity to the evaluation of site conditions, it would be unlikely to significantly change the Trustee Council’s Phase 2 determinations. The Commencement Bay Trustee Council expended substantial effort to develop the Hylebos Waterway thresholds and used them in a habitat equivalency analysis that

produced defensible settlements. The Trustee Council believes the Hylebos model can be used at Portland Harbor to achieve reasonable, defensible settlements as well.

- C.4.3 Commenter advocated for the Trustee Council's use of updates to the PHAA database to inform the damage calculation (Comment 021).

Response – The Trustee Council is aware of these updates to the PHAA database. NOAA has incorporated Pre-Remedial Design datasets into DIVER Explorer. The Trustee Council is considering these data in the formal damage assessment (i.e., post settlement phase) now underway.

C.5 Category – Geographic Scope

- C.5.1 Commenters expressed support for projects located within the PHAA, and they encouraged the implementation of additional restoration projects in the PHAA but distanced from the cluster of restoration projects near river miles 3 to 4 that the Trustee Council determined are eligible under the Preferred Alternative (Comments 005 and 025).

Response – The Trustee Council recognizes potential benefits of geographic distribution of restoration projects across Portland Harbor, as well as benefits to the clustering of several restoration projects to enhance habitat connectivity. As described in response to Comment 001 in C.1.2 above, in potential future restoration plans the Trustee Council may choose to undertake additional projects. This SRP will guide how the Trustee Council manages settlement compensation recovered through any Phase 2 settlements occurring in the short term. If additional settlements occur in the future, the Trustee Council may consider other restoration alternatives, including potential restoration projects elsewhere in Portland Harbor, if available.

C.6 Category – Individual Restoration Site

- C.6.1 Commenter inquired whether off-site disposal of contaminated material was considered in the evaluation of specific restoration projects (Comment 004).

Response – The Trustee Council considered potential off-site impacts when screening potential projects to determine if they were appropriate for NRDA compensation. Also, while providing technical assistance to project developers working on particular restoration projects, the Trustee Council has evaluated the presence of contamination on each site. The Habitat Equivalency Model used to calculate the ecological benefits of a particular restoration project only evaluates the conditions within the restoration project site, comparing its condition before and after restoration. This includes any impacts from on-site contamination before or after restoration. The model does not evaluate potential off-site impacts from the project, such as landfill disposal. Restoration projects are subject to local, state, and federal permitting and compliance requirements, and they must comply with those requirements. For the restoration projects evaluated within the SRP, there has not yet been a need for off-site disposal of large amounts of contaminated material. In most of the cases where low-level contamination has been identified and excavated on a particular restoration project, it has been placed on site in upland habitat and covered with clean fill to reduce exposure to fish, wildlife, and people. In

these situations, a contaminated media management plan is usually developed under guidance from DEQ.

- C.6.2 Commenter encouraged consideration of West Hayden Island as a potential NRDA restoration project (Comment 026).

Response – The Trustee Council agrees that there is restoration and conservation potential at the West Hayden Island project site. For that reason, the project is included in the Trustee Council's Ecological Restoration Portfolio. As described above in response to Comment 001 (see C.1.2) and Comment 005 (see C.5.1), future phases of the NRDA may provide the opportunity to consider other restoration alternatives or pursue additional restoration projects.

C.7 Category – Monitoring and Stewardship

- C.7.1 Commenter inquired about what happens after the 10-year monitoring period is over (Comment 002).

Response – Once a project has completed 10 years of effectiveness monitoring and the performance period is over, the long-term stewardship phase of the project will begin. Long-term stewardship will involve activities such as regular site visits, maintenance, ongoing monitoring if needed, and other tasks required to maintain project effectiveness and functionality in perpetuity. The entity that will perform long-term stewardship at each restoration project has not yet been determined. That entity and a plan to guide their work must be in place prior to the end of the 10-year performance period. In addition, the monitoring plan for Pacific lamprey extends for a period of 20 years. It will begin during the project's performance period and end during the long-term stewardship phase.

- C.7.2 Commenter inquired about who will be responsible for continuing to fund the operations and monitoring in perpetuity (Comment 003).

Response – The project developers are required to provide the funding for long-term stewardship. Prior to the end of the project's performance period, the funding for long-term stewardship will be transferred to a stewardship fund and invested such that it will provide sufficient funds for management of the project in perpetuity. The stewardship fund will be overseen by a third party fiscal manager.

- C.7.3 Commenter inquired about monitoring and adaptive management of mitigation measures during project construction (Comment 017).

Response – As noted above in response to Comment 011 (see C.3.1), the specific environmental impacts and required mitigation measures at each of the restoration projects described in the SRP are regulated by the relevant agencies directly with the project developers. The Trustee Council has a robust effectiveness monitoring plan and adaptive management framework in place at each of the restoration projects that has been implemented thus far. If new contaminated sites are discovered or new corrective actions are proposed, the Trustee Council will continue to coordinate with EPA and the DEQ as described in response to Comment 016 above (see C.3.2).

C.8 Category – Project Planning and Implementation

- C.8.1 Commenter encouraged the Trustee Council to consider how to maximize benefits to the community from the restoration bank projects (Comment 030).

Response – The Trustee Council appreciates the stakeholder's desire to maximize the benefits of any restoration projects, not just to the natural resources but to the affected community as well. That said, the NRDA process is driven by CERCLA and its regulations, which mandate that the Trustee Council focus its restoration selection process on benefits to the affected resources. Inserting additional requirements unrelated to ecological benefits would also be problematic to the Trustee Council for both legal and practical reasons. The federal trustees, for example, would be limited in their ability to place requirements on the size or business structure of a project implementer, who such an implementer may contract with, or how they reinvest their profits. Practically speaking, these types of requirements would also have the Trustee Council making problematic judgment calls regarding the "worthiness" of one group over another. For example, if a stated goal were to contribute profits to local communities, how would the Trustee Council delineate the eligible communities or "worthy" causes? Notwithstanding these limitations of the Trustee Council, the Portland Harbor stakeholders are certainly entitled to communicate directly with project implementers individually or through community organizations to make their concerns known.

C.9 Category – Public Participation

- C.9.1 Commenter expressed interest in closer communication with the Trustee Council, particularly the Tribal representatives to the Trustee Council (Comment 006).

Response – Each Tribe participating as a member of the Trustee Council is an independent sovereign with its own processes for engagement with members of the public or organizations. Persons interested in working with a Tribe are encouraged to learn more about the Tribe's individual decision-making structures, customs, and protocols. To seek out the input of a particular Tribe, interested parties may reach out to the Tribe directly.

- C.9.2 Commenter encouraged the Trustee Council to regularly present to the community through the new Portland Harbor Collaborative convened by EPA (Comment 008).

Response – NOAA and the Trustee Council appreciate the invitation to regularly present updates to the new Portland Harbor Collaborative being convened by EPA. The Trustee Council also recognizes the fatigue that community members and groups may face when navigating among the many parties involved with the Portland Harbor Superfund Site. To that end, the Trustee Council aims to provide Trustee Council updates to the public in convenient and focused ways including annual presentation to the Portland Harbor Community Advisory Group, website updates, newsletters, and other forms of outreach. As the Portland Harbor Collaborative forms, the Trustee Council will consider whether regular participation or occasional presentations to this group may be appropriate and within our capacity.

- C.9.3 Commenters inquired about engaging with the Trustee Council on the topic of inclusive procurement tools and community benefits (Comment 009).

Response – While this is part of a formal public comment period, the Trustee Council values stakeholders' views and feedback throughout the entire NRDA process. The Trustee Council may be limited in its ability to impose non-ecological requirements on project implementers (see response to Comment 030 above [see C.8.1]); however, the Trustee Council welcomes the community's feedback on ways in which we can make the NRDA process as inclusive as possible and look forward to future discussions with Portland Harbor stakeholders.

- C.9.4 Commenter encouraged the Trustee Council make the NRDA process more transparent and accessible to stakeholders, including specific recommendations for the Trustee Council to consider (Comment 023).

Response – The Trustee Council aims to provide information to the public in transparent and accessible ways despite the complexity of the NRDA process and the confidential nature of the settlement-oriented process. To this end, the Trustee Council provides annual presentations to the Portland Harbor Community Advisory Group, occasional presentations to the Portland Harbor Community Coalition, Urban Ecological Research Consortium, and other interested stakeholders. The Trustee Council has staffed information tables at various river-focused community events in Portland (such as SeaPort Celebration, The Big Float, Sunday Parkways, and others). The Trustee Council maintains a newsletter email list with more than 400 subscribers, as well as a public website where documents, updates, and outreach materials are posted. The Trustee Council appreciates the suggestions for additional ways to achieve more inclusive public engagement.

C.10 Category – Recreation

- C.10.1 Commenters requested more information about restoration for lost recreation services and encouraged public involvement in restoration planning for recreation (Comments 007 and 029).

Response – The Trustee Council's priority for recreation is to connect people to the river for recreational and fishing opportunities. Ecological restoration may have indirect benefits to recreation (e.g., more physically attractive spaces with greater use by wildlife), but most ecological restoration actions will not have a direct relationship to the recreational loss.

Some types of recreation restoration projects the Trustee Council may consider include the following:

- Projects to provide quality fishing opportunities at fishing docks and boat ramps, and along natural shorelines
- Projects to provide new or improved safe access to the river, with particular consideration for disabled persons, underrepresented communities, and families
- Projects designed to limit the impact of human use on sensitive ecological restoration areas
- Projects that incorporate educational components into recreational opportunities

The Trustee Council will identify a separate process to select appropriate restoration for recreational losses in a future phase of restoration planning. In the meantime, the Trustee Council will set aside a portion of recoveries from Phase 2 settlements to fund those actions. Given the nature of the restoration and the keen interest from the Portland Harbor community, when this phase of planning occurs, the Trustee Council will work to emphasize stakeholder involvement. The Trustee Council has not yet established a firm timeline for this work.

Appendix D

Public Comments Received



PUBLIC COMMENTS RECEIVED

The public comment period for the Draft Portland Harbor Supplemental Restoration Plan and Environmental Assessment (Draft SRP) opened on August 13, 2020, and closed on September 14, 2020.

During the public comment period, the Trustee Council received eight submissions from private citizens, businesses, non-governmental organizations, and federal, state, and local agencies. Each submission was carefully read and individual comments within the submissions were delineated, resulting in 31 individual comments. The full submissions, including the delineated comments, are included in this Appendix. Comment numbers were assigned to each delineated comment within the eight submissions, as shown below (Table D-1). Comment responses can be found in Appendix C.

Table D-1. Delineated Comment Number ID by Commentor

Commentor	Delineated Comment Number ID
Cassie Cohen, Portland Harbor Community Coalition	001 – 009
Jessica Hamilton, Port of Portland	010
Andrew J. Baca, U.S. Environmental Protection Agency	011 – 017
John Ost, Private Citizen	018
Todd Slater, Legacy Site Services LLC, agent for Arkema Inc.	019 – 021
Christopher Bozzini, Portland General Electric	022
Bob Sallinger, Audubon Society of Portland	023 – 030
Travis Williams, Willamette Riverkeeper	031



Cassie Cohen, Executive Director
ourfutureriver.org
pdxharborcommunitycoalition@gmail.com
503-816-4342

September 14, 2020

Re: Draft Supplemental Restoration Plan and Environmental Assessment

Dear Portland Harbor Natural Resource Trustee Council:

PHCC supports the evaluation of natural resource damages and the planning for restoration of those damages at this time. We would be interested in exploring other models later with the Trustee Council.

001

➤ Although all of the responses to the RFP were proposals for a banking system, did the Trustee Council evaluate any of the other options and how might you consider other options in the future?

002

➤ What happens after the 10-year monitoring period is over?

003

➤ Who will be responsible for continuing to fund the operations and monitoring that the report states will be required “in perpetuity”?

004

➤ When calculating the ecological benefits of a particular restoration project, were the ecological costs associated with offsite disposal of contaminated material considered? For example, if 50,000 cubic yards of contaminated soil are removed from a site and disposed of at a local landfill, was the degradation associated with the disposal included in the project assessment?

005

Although the example projects restore habitat according to the integrated habitat restoration guidelines presented in the Trust’s previous reports, they are all located some distance away from the main part of the Portland Harbor Superfund Site. PHCC realizes that there is benefit to ecological restoration in these areas. We understand this was a deliberative decision making process of the trustee council and it is probably too late to change anything. But salmon habitat restoration is such a high priority for so many community groups here in the Portland Harbor Superfund zone that we hope there is a way to reopen the conversation about possibilities to expand and better integrate restoration into more areas bordering the superfund area.

➤ However, will additional projects targeting the main Portland Harbor contaminated area be considered in the future?

006

We are often told that the Superfund process is one of the most closed, confidential processes of any governmental process. We wonder if the NRDA process is similar in that regard. We would like to engage with the Trustee Council to explore how to make the process moving forward more transparent, equitable, and inclusive, especially for environmental justice communities who have been disproportionately harmed historically or currently. We appreciate the communication, invitations to meet, and presentations to our coalition over the years. We appreciate the coordination of the NOAA team and their responsiveness. We would like to determine more direct ways to engage on a regular basis with representatives of the Trustee Council. One local funder asked us why we did not have working relationships with Tribes, and encouraged us to work harder to make that happen.

- *Would the Tribes and Tribal representatives be open to exploring this question collaboratively about ways to develop Tribal and local community collaboration/working relationships? As well as Trustee Council and community working relationships?*

007

We have been in conversation with some community leaders who were involved in other NRDA processes in other regions who had experiences of extensive and ongoing community involvement in restoration projects as well as the establishment of recreation funds. Recreation and community involvement in future restoration projects was not highlighted in this public comment period it seems.

- *How can PHCC be kept informed early on in the process before decisions are made about future recreation and restoration? It would be helpful to get some type of timeline or idea of the steps or procedures that are expected to follow with this process, using graphics, videos, and storytelling. These are the tools community members are telling EPA to use to recruit more community groups to join the new Collaborative.*

008

We understand NRDA is its own governmental decision making process and entity. But for the community, the new Collaborative will be one way to bring all interrelated bodies together to avoid the common fatigue that community groups experience having to navigate dozens of agencies and parties.

- *Will NRDA be able to regularly present updates to the new Portland Harbor Collaborative convened by EPA?*

009

Finally, we look forward to re-engaging with the Trustee Council representatives regarding the inclusive procurement tools and community benefits. Just today, on September 14, 2020, we presented at EPA's quarterly community leaders forum about how to make the superfund process more equitable and inclusive, and have plans to present at the December 2020 EPA Public Forum. Thank you for reviewing documents we sent to you through Lauren Senkyer

- *Can we arrange a time soon to open up this conversation again with the Trustee Council?*

Thank you again for your commitment to moving forward the NRDA process. It is so important, and we hope to find ways to be more involved in the future.

Respectfully,

A handwritten signature in cursive script that reads "Cassie L. Cohen". The letters are fluid and connected, with a prominent loop at the end of the word "Cohen".

Cassie L. Cohen, Executive Director
Portland Harbor Community Coalition

September 14, 2020

Lauren Senkyr
NOAA Restoration Center
C/O Parametrix
700 NE Multnomah Street, Suite 1000
Portland, Oregon 97232

Submitted via email: portlandharbor.nrda@gmail.com

Dear Lauren:

Thank you for the opportunity to comment on the Draft Portland Harbor Supplemental Restoration Plan and Environmental Assessment. This letter provides Port of Portland comments on the plan and support for restoration and mitigation banks.

The Preferred Alternative selected in the Draft Supplemental Restoration Plan is the Restoration Bank Credit Alternative. This alternative includes the purchase of credits by the Portland Harbor Trustee Council with funds received by the Trustee Council from a potentially responsible party (PRP) in settlement, as well as Trustee Council acceptance of credits purchased by a PRP who offers those credits to the Trustee Council in settlement.

010 The Port fully supports the Trustees' Preferred Alternative and the five restoration banking projects. The ability of a bank to serve both NRDA and other purposes result in more integrated and self-sustaining restoration. Restoration bank developers work with the Trustees on project planning, permitting, monitoring, adaptive management, and long-term stewardship. Furthermore, restoration bank developers are required to provide financial and other assurances to help ensure project success. As such, the Port encourages the Trustees to distribute cash-out settlement payments as quickly as possible to reward the developers who acted early and took on the risk, accountability and the benefits that come from aggregating large parcels for habitat restoration.

Sincerely,

Jessica
Hamilton

Jessica Hamilton

Director, Harbor Environmental

Digitally signed by Jessica
Hamilton
Date: 2020.09.14
09:26:07 -07'00'

CC: Beverly Pearman, Port of Portland
Dwight Leisle, Port of Portland



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10**

1200 Sixth Avenue, Suite 155
Seattle, WA 98101-3188

September 10, 2020

REGIONAL
ADMINISTRATOR'S
DIVISION

Lauren Senkyr
Restoration Center
National Oceanic and Atmospheric Administration
1201 NE Lloyd Blvd. #1100
Portland, Oregon 97232

Dear Ms. Senkyr:

The U.S. Environmental Protection Agency has reviewed the National Oceanic and Atmospheric Administration's Portland Harbor Draft Supplemental Restoration Plan and Environmental Assessment (EPA R10 Project Number 20-0038-NOAA). Our comments are provided pursuant to the National Environmental Policy Act and Section 309 of the Clean Air Act.

The Draft SRP/EA analyzes the potential environmental impacts associated with activities to restore natural resources and ecological services injured or lost as a result of releases of hazardous substances and discharges of oil within the Portland Harbor Assessment Area or Portland Harbor. For analysis of impacts from the activities, NOAA considered one action alternative and a no action. Under the proposed action and preferred alternative, there would be five restoration banks (large-scale restoration projects developed with the intent of generating restoration credits, often for sale) including Alder Creek Restoration Project, Harborton Habitat Development Project, Linnton Mill Restoration Site, Miller Creek Restoration Project, and Rinearson Natural Area Restoration Site.¹ The Draft SRP/EA tiers to the 2017 Portland Harbor Programmatic Environmental Impact Statement and Restoration Plan that provided an overall restoration approach, comprehensive framework for implementation, and a broad analysis of the environmental impacts.

Our review finds that the Draft SRP/EA includes analysis of specific resources that would be impacted by the proposed action, nature of the potential impacts, and measures that would be followed to avoid, minimize, and mitigate impacts. Even though most of the potential impacts from the restoration banks would be due to construction and operation activities, and mitigation measures would be applied to keep the impacts from becoming significant, we believe that it will be important to coordinate with other entities that may include federal, state and tribal agencies throughout the implementation of the restoration actions to ensure that activities would be conducted in a manner protective of human health and the environment. We recommend that the Final SRP/EA include additional clarifying information on the following topics.

Potential impacts to water quality and beneficial uses

As construction and operation activities may impact water resources, resulting in alterations of local hydrology and floodplains, as well as long-term impacts to water quality parameters and designated

¹ Draft SRP/EA, p. 35.

beneficial uses due to increased turbidity and sedimentation of pollutant receiving waters in Portland Harbor, we recommend that the Final FR/EA:

- 011 Provide the most current information regarding the status of the Clean Water Act Section 401 and 404 permit application processes and conditions to ensure implementation of restoration banks would meet the State of Oregon Water Quality Standards. The Draft SRP/EA indicates that activities (e.g., in-water excavation) could occur near or within waterways, including those that are currently on the 303(d) list;²
- 012 Include information to demonstrate that the proposed action would adhere to the anti-degradation provisions of the Clean Water Act to prevent deterioration of water quality within waterways that currently meet the State of Oregon WQS;³
- 013 Indicate how NOAA will be working collaboratively with Oregon Department of Environmental Quality to ensure compliance with Water Quality Restoration Plans that will function as NOAA's share of the Lower Willamette Subbasin Total Maximum Daily Load implementation, designed to meet federal and state water quality rules and regulations;
- 014 Discuss the National Pollutant Discharge Elimination System permit application process and measures to protect water quality. The Draft SRP/EA indicates that construction of the restoration banks would involve soil disturbance caused by grading, excavation, and soil removal which would result in erosion and discharge of pollutants to nearby waterways. Because of these activities, construction of the proposed restoration banks may be subject to NPDES permitting requirements for discharges to waters of the United States and a related Stormwater Pollution Prevention Plan, as well as construction best management practices; and
- 015 Describe plans to coordinate with ODEQ, and all affected tribes to assure that state and tribal water resources are protected from impacts associated with construction and operation of the proposed restoration banks.

Potential impacts on contaminated sites and monitoring

016 We recommend that NOAA coordinate with the EPA Superfund Program as the project is implemented so that the proposed restoration actions are consistent with agreed upon remedies for relevant contaminated site cleanup and monitoring. The Draft SRP/EA indicates the existence of contaminated sites in the restoration area and the possibility that more contaminated sites could be discovered during construction and operation of the restoration banks. Portland Harbor Superfund Site EPA Remedial Program Manager Hunter Young is the Trustee Council liaison and may be reached at (503) 326-5020 or young.hunter@epa.gov. It would also be helpful to coordinate with ODEQ so that the Final SRP/EA identifies all the contaminated sites in the planning area and discusses measures to take to minimize project construction impacts and meet state requirements.

Adaptive management and effectiveness monitoring

017 We also recommend the Final SRP/EA include an environmental inspection program designed to assess the impacts from the restoration banks and effectiveness of mitigation measures. We encourage NOAA to indicate how the program would use an effective feedback mechanism, such as adaptive management, so that any needed adjustments can be made to the projects to meet environmental objectives during operations and maintenance. For example, the Final SRP/EA can discuss plans for monitoring newly

²Draft SRP/EA, p. 63, 66.

³<https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=68675#:~:text=The%20purpose%20of%20the%20Antidegradation,full%20protection%20of%20all%20existing>

discovered contaminated sites and taking corrective action if pollutant levels exceed standards or pose a risk to human health and the environment.

Thank you for the opportunity to review this Draft SRP/EA. If you have questions about our comments, please contact Theo Mbabaliye of my Staff at (206) 553-6322 or mbabaliye.theogene@epa.gov.

Sincerely,

Andrew J. Baca
Director

Comments RE: Draft Supplemental Restoration Plan and Environmental Assessment

018 The Environmental Assessment is deficient for not including air borne contamination of the Willamette River and tributary waterways and lands from transportation. Transportation associated contamination began with the beginning of European settlement and continues. The transportation associated contaminants have changed over time. The ones that are currently of concern are those from gasoline and diesel motor vehicles, trains, and vessels both recreational and commercial. By-products from the burning of fossil fuels by vehicles began to contaminate the Willamette River in the very early 1900s.

The by-products of fossil fuel burning by internal combustion engines have always included PAHs, dioxins, and furans. Depending on additives additional compounds, such as, PCBs and metals are emitted from their exhaust. Other sources of waterway contaminants from motor vehicles include micro tire and brake wear particles and metals used in their manufacture.

Both Seattle and San Francisco on the west coast acknowledge that the transportation sector is a major contributor to waterway contamination and the degradation of its ecosystem services, including reducing populations of valuable aquatic species, such as, salmon.

018 Assessment of recovery of the Willamette River needs to include (1) assessing the contribution of vehicle pollutants in the lost and declining environmental services of the Willamette, (2) monitoring vehicle pollutants in the ambient air and (3) strategies for reducing vehicle pollutants.

A 2009 paper by R.deAbrantes, et.al in vol. 123 of Transactions on Ecology and the Environment titled **“Correlations between the exhaust emissions of dioxins, furans, and PAH in gasohol and ethanol vehicles”** identified all three classes of toxins in automobile exhaust.

<https://www.witpress.com/Secure/elibrary/papers/AIR09/AIR09019FU1.pdf>

Abstract

The emissions of seventeen 2,3,7,8 substituted Polychlorinated Dibenzo-pDioxins, Polychlorinated Dibenzofurans (PCDD/Fs) and sixteen Polycyclic Aromatic Hydrocarbons (PAH) [14] in the exhaust pipes of spark ignition light duty vehicles considered toxic to human health were investigated. The formations of these compounds were evaluated under the influence of variations of fuels and fuel additives. Standard tests in a gasohol (gasohol is pure gasoline plus 20% to 25% of anhydrous ethyl alcohol fuel (AEAF)) vehicle and in an ethanol vehicle were performed with variations in the quality of fuels. The sampling of the PCDD/Fs followed the recommendations of a modified 23 method and the analysis basically followed the 8290 method. The recommendations of the TO-13 method were followed for the PAH analysis, with the necessary modifications for a vehicular emission laboratory. The emission factors of the total PCDD/Fs varied between undetected and 0.157 pg I-TEQ/km. The emission factors of the total PAH varied from 0.01 µg TEQ/km to 4.61 µg TEQ/km. Significant and positive correlations were observed between the emissions of naphthalene, acenaphthylene, fluorene, phenanthrene, anthracene and fluoranthene and significant and negative correlations were observed between the emissions of CO₂ and fluoranthene in the gasohol vehicle. Significant and positive correlations between carbon

monoxide and phenanthrene and between acenaphthylene, fluorene and fluoranthene in the alcohol vehicle were also observed, apart from significant and negative correlations between NO_x and phenanthrene. In general way, significant correlations between PAH and PCDD/Fs were not observed, except in the ethanol vehicle considering phenanthrene.

An October, 1994 paper by G.G. Mason in Environmental Health Perspectives titled “Dioxin-receptor ligands in urban air and vehicle exhaust” demonstrated the potential for biological damage by dioxins from vehicle exhaust.

<https://pubmed.ncbi.nlm.nih.gov/7529698/>

Abstract

The ability of extracts of urban air and vehicle exhaust particulates to bind to the dioxin receptor has been determined. It was shown that such extracts do contain significant amounts of dioxin-receptor binding activity. The level of dioxin-receptor binding found in ambient air reflects its pollution level as determined by mutagenic activity. Furthermore, it was shown that the extracts of both urban air and vehicle exhaust particulates could provoke the induction of cytochrome P450IA1 in cultured rat hepatoma cells. Chemical fractionation of the extracts revealed that the majority of the dioxin-receptor binding activity from urban air and gasoline vehicle samples fractionated with the polycyclic aromatic compounds. However, unknown polycyclic aromatic compounds were responsible for the majority of the binding activity measured. In the case of diesel vehicle exhausts, the majority of the dioxin-receptor binding activity was found to be associated with nitro-polycyclic aromatic compounds. Studies with a variety of diesel fuels showed that the amount of dioxin-receptor ligands present in exhaust emissions are fuel-dependent and that substantia

Heavy metals from vehicle exhaust and tire and brake wear as waterway pollutants:

In the February, 2018 issue of Puget Soundkeeper, Amanda Bidwell published an article titled “Moss tells a story of urban pollution”. In it she looked at “common heavy metals that are associated with urbanization and the transportation sector (exhaust emissions, diesel fuel/soot, brake and tire attrition, and lubricant degradation). The priority elements of interest include arsenic, cadmium, chromium, copper, iron, manganese, nickel, lead, strontium, titanium and zinc. Six of these (arsenic, chromium, copper, manganese, nickel and lead) are on the EPA’s list of the top 30 hazardous air pollutants that pose the greatest potential human health concerns in urban areas. Several of these elements are also hazardous to aquatic organisms and can bioaccumulate up the foodweb. Roughly half of the copper (66 tons/year) entering Puget Sound originates from brake pad attrition. In 2010 the WA State legislature

passed the Better Brake Rule (Chapter 173-901 WAC) that limits the amount of toxic material in brake pads and shoes.” She noted that “The highest levels of several metals were found in moss near Longfellow Creek, [where Soundkeeper has conducted salmon surveys for the past three years](#) to determine why many salmon returning to the creek die before they spawn.”

Article:

Environmental scientist Amanda Bidwell has joined Soundkeeper for multiple Pint-Sized Science events, sharing the fascinating findings from her master’s degree research, which used moss as a tool for measuring environmental contamination. Below she answers some questions about her research, which revealed important trends in urban pollution. The highest levels of several metals were found in moss near Longfellow Creek, [where Soundkeeper has conducted salmon surveys for the past three years](#) to determine why many salmon returning to the creek die before they spawn.



Why study moss? What can it tell us about pollution?

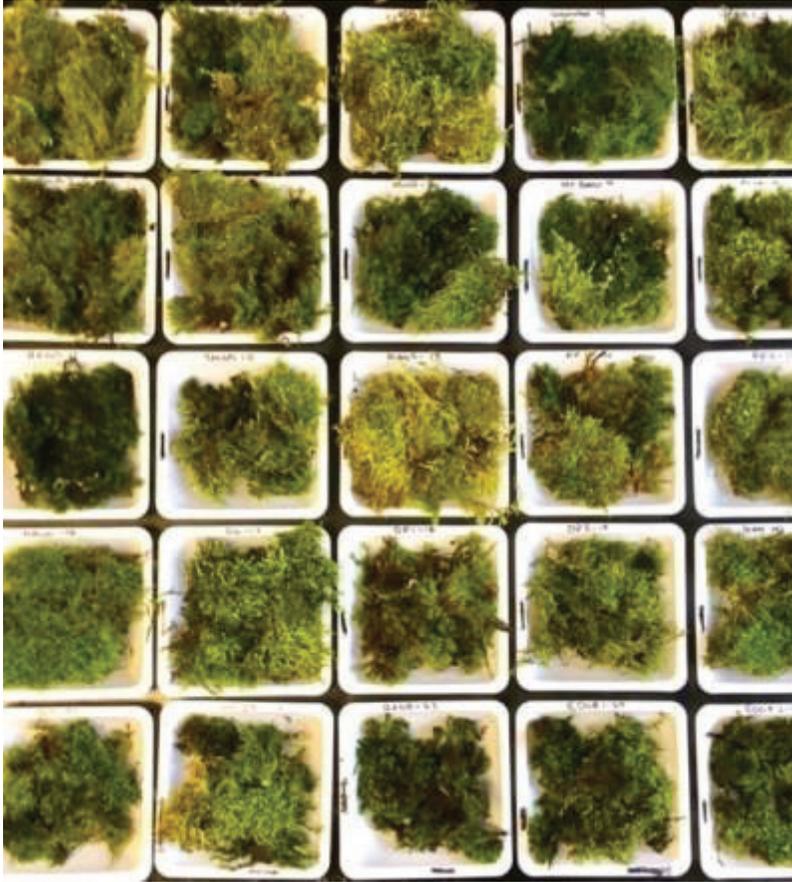
There is a long history of using moss as a bioindicator of air quality in Europe, dating back to the late 1960s (Röhling and Tyler 1968). Moss, unlike vascular plants, lacks a protective epidermis which allows for the free exchange of solutions and gas across its entire cell surface, similar to a sponge. As an epiphyte, it absorbs all of its nutrients and water from the air. This means if there are elevated levels of heavy metals in an area, moss will absorb wet deposition and trap particulates on its surface. Although the exact period represented by metals in moss tissue is unknown, it likely ranges between several months up to a few years. Most studies that use moss as bioindicators only use the top 2/3 of the moss

shoot which represent, at maximum, a three year exposure period. Moss is a inexpensive way to screen urban pollution over a larger area and it provides a snapshot of wet and dry pollution over a short period of time.

The primary objective of my research was to see if moss could be used as an indicator of air quality and pollution in Washington. Given the iconic image of moss-draped forests in the PNW, we were curious as to how these moss communities were responding to varying levels of pollution. We established sites on the Western side of the Olympic Peninsula to act as our “clean sites”, along the I-90 corridor to act as our “intermediate sites”, and sites in Seattle to act as the “polluted sites”.

What are the most common pollutants you found in your research?

We are interested in looking at common heavy metals that are associated with urbanization and the transportation sector (exhaust emissions, diesel fuel/soot, brake and tire attrition, and lubricant degradation). The priority elements of interest include arsenic, cadmium, chromium, copper, iron, manganese, nickel, lead, strontium, titanium and zinc. Six of these (arsenic, chromium, copper, manganese, nickel and lead) are on the EPA’s list of the top 30 hazardous air pollutants that pose the greatest potential human health concerns in urban areas. Several of these elements are also hazardous to aquatic organisms and can bioaccumulate up the foodweb. Roughly half of the copper (66 tons/year) entering Puget Sound originates from brake pad attrition. In 2010 the WA State legislature passed the Better Brake Rule (Chapter 173-901 WAC) that limits the amount of toxic material in brake pads and shoes.



The results from my M.S. research showed moss can be used as a comparative index of metal deposition and as a screening tool to assess metal pollution in Western Washington. The highest levels of moss metal concentrations were found in Seattle, followed by sites along the I-90 corridor. The lowest metal concentrations were observed in moss collected from the Western side of the Olympic peninsula where average daily traffic rates and urbanization influences are the lowest. There was a significant difference in metal concentrations observed across these 3 areas (urban, suburban, and rural), meaning each zone was environmentally distinct from the others. The elevated metal concentrations found in moss collected from Seattle sites were significantly correlated with heavier average daily traffic counts compared to the peninsula samples. In Seattle, we observed the highest levels of cadmium, chromium, iron, titanium, and zinc in moss collected from the Longfellow Creek Greenspace.

What does this tell us about the impact of people on our environment?

The [Puget Sound Regional Council](#) expects our area to grow by around 900,000 people over the next 22 years, which will in turn increase demand for travel throughout the region by 40%. With this region-wide expansion in traffic and congestion, there is the opportunity for more heavy metals to enter the environment, which has the potential to negatively impact both terrestrial and aquatic ecosystem health.

What's the next step for this research?

I am currently working with Seattle Parks & Recreation and Green Seattle Partnership to expand the moss monitoring to 25 parks, greenbelts, and natural areas across Seattle. We are tracking urban pollution to determine the extent and threat it is having on forest health across the city. Field and lab work was completed in early February completed, now I am working on analyzing the results to see what stories lie within the data.

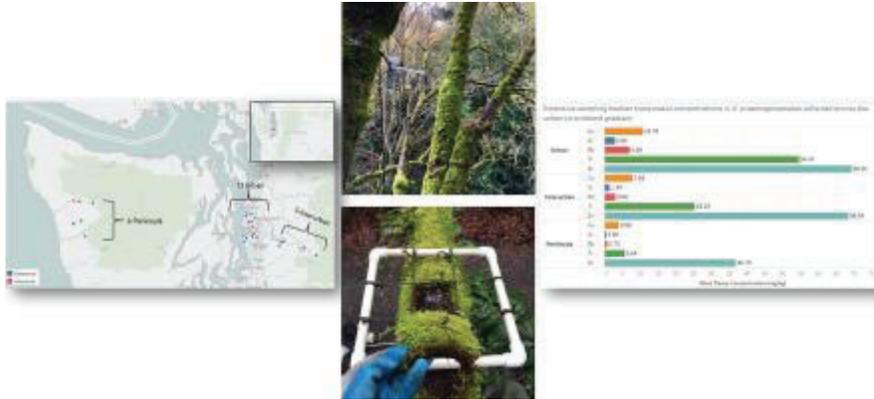
To learn more about WA's Better Brake Rule and steps you can take to purchase Level A, B or N brakes, [visit the Washington Department of Ecology website.](#)

She subsequently published her findings:

<https://www.sciencedirect.com/science/article/abs/pii/S0048969719333248>

Abstract

Major and trace element deposition across western Washington, USA was assessed in 2016 and 2017 by analyzing tissue metal concentrations in the epiphytic mosses *Isoetes stoloniferum* (Bridel) and *Kindbergia praelonga* (Hedw.) Ochyra. We used an intensive, vertically stratified sampling approach in *Acer macrophyllum* canopies in the Hoh Rainforest on the Olympic Peninsula, WA and in Seattle, WA to collect 214 samples of *I. stoloniferum*. An extensive, ground-based sampling approach was used across an urban-to-wildland gradient to collect 59 *K. praelonga* samples. Intensive samples were collected four times (April, July, and October of 2016 and in January 2017) and extensive samples three times (April, July, and October 2016) to assess seasonal differences in metal concentrations across sampling locations. A total of 273 moss samples were analyzed for Cd, Cr, Cu, Fe, K, Mg, Mn, Ni, Pb, Sr, Ti, and Zn concentrations. Elevated concentrations of these elements were found in moss samples from both intensive and extensive sampling efforts across all seasons. Sampling location for both intensive and extensive sampling efforts was found to be a significant factor in determining moss metal concentrations. Metal deposition in and around Seattle appears to be derived from the regional transportation sector and other industrial sources. Ten *I. stoloniferum* samples from Seattle and the Hoh Rainforest were analyzed for Pb and Sr isotope ratios to help differentiate between natural and industrial-based emission sources. Hoh Rainforest Pb isotopes appear to be explained by a mixture of long-range Asian Pb influences and natural Pb sources, whereas Seattle Pb isotopes appear driven by industrial and road dust sources.



Vehicle Microplastics as major aquatic pollutants and as carriers of heavy metals:

(A) An October, 2019 article in the Los Angeles Times “Biggest likely source of microplastics in California waters: Car Tires”

<https://www.latimes.com/environment/story/2019-10-02/california-microplastics-ocean-study>

Article:

BERKELEY — Driving is not just an air pollution and climate change problem — turns out, it just might be the largest contributor of microplastics in California coastal waters.

That is one of many new findings, [released](#) Wednesday, from the most comprehensive study to date on microplastics in California. Rainfall washes more than 7 trillion pieces of microplastics, much of it tire particles left behind on streets, into San Francisco Bay each year — an amount 300 times greater than what comes from microfibers washing off polyester clothes, microbeads from beauty products and the many other plastics washing down our sinks and sewers.

These tiny plastics, invisible to the naked eye, have been vilified for tainting water and wildlife but are notoriously difficult to study. They’re everywhere and seemingly come from everywhere. They wash into the ocean in all different shapes and sizes, many covered with dyes and chemicals. Scientists and labs across the state, the nation and the world haven’t even agreed on how exactly to measure or sample or study them.

So a team of researchers, led by the San Francisco Estuary Institute and the 5 Gyres Institute, a nonprofit research group focused on reducing plastic pollution, set off to create an inventory of sorts to identify all the ways these different microplastics were getting into San Francisco Bay. They analyzed hundreds of samples from fish, sediment, surface water, wastewater and stormwater runoff and tried to trace the origins of all these particles.

Mark Gold, who heads the state's Ocean Protection Council and was recently appointed the state's deputy secretary for ocean and coastal policy, said he was surprised that car tire particles were such a large source.

"I'm so used to thinking of the toxics that come from urban runoff and not the actual physical particles from something like tire dust," said Gold, who has worked for 30 years on cleaning up California's beaches and oceans from toxic chemicals. "But the sheer number of particles ... the scope and scale of this problem makes you realize that this is something that's definitely worth looking at a great deal more seriously."

Once plastic enters the environment, it breaks down into smaller and smaller pieces but never goes away. The tiny particles make their way into the ocean, into the stomachs of marine animals, and ultimately become part of the food and water people consume.

A recent UC Davis [study](#) sampled seafood sold at local markets in Half Moon Bay, Calif., and found that one-quarter of the fish and one-third of the shellfish contained plastic debris. A survey comparing [150 tap-water samples](#) from five continents found synthetic microfibers in almost every sample — 94% in the United States.

Microplastics have been [found](#) in Lake Tahoe, in the [deep, deep ocean](#) — even in the [Arctic](#), one of the most remote regions in the world. A [scientific review](#) of 52 studies recently concluded that humans on average consume a credit card's worth of microplastic each week. The European Union is trying to classify microplastics as a contaminant that is unsafe at any level of discharge.

"We're using more and more plastic and it's showing up as a footprint on the seafloor," [said](#) Jennifer Brandon, a microplastics biologist at UC San Diego's Scripps Institution of Oceanography whose [research](#) found that since the 1940s, the amount of microscopic plastics has doubled about every 15 years. "It begs the question: Is this what our civilization is going to be remembered for?"



Brown pelicans at San Francisco Bay in Sausalito, Calif. Trillions of microplastic particles, invisible to the naked eye, dump into the bay every year and work their way through fish and birds and the rest of the food chain.

(Eric Risberg / Associated Press)

Microplastics are commonly defined as plastic particles smaller than 5 millimeters and classified into five general shape categories: foam, “sphere or pellets,” such as microbeads; jagged “fragments” from larger plastic debris; “film,” such as breakdowns from plastic bags and wraps; and “fibers,” from the likes of textiles, fishing gear and even cigarette filters. Rubber is also considered plastic, both natural (isoprene) and synthetic (styrene butadiene).

These particles often contain harmful chemical additives such as flame retardants or plasticizers, but the overwhelming diversity in size and chemical composition also makes toxicity difficult to predict, let alone study.

What's missing right now is a systematic approach to evaluating all these different microplastics. When every study does it differently, it's hard to compare results, said Susanne Brander, an environmental toxicologist at Oregon State University.

As for rubber fragments, they can be toxic because of the fossil-fuel-associated compounds that they're likely picking up. The San Francisco findings, Brander added, are a window into other populated coastal areas with so many bridges and roads crisscrossing the watershed.

San Francisco Bay is a good laboratory for investigating this emerging contaminant in an urban environment. Essentially a bathtub surrounded by more than 7 million people, it ends up trapping many of the contaminants before they disperse into the greater ocean.

(Los Angeles Times)

In the latest study, a three-year, \$1.1-million effort by a large team of researchers, microplastics from almost 400 samples were identified and analyzed with microscopes, tweezers and lasers in an ecotoxicology [lab](#) at the University of Toronto. By establishing new standards for doing a large-scale study of a major estuary and creating a baseline for all these diverse plastics, scientists found clues to where all the particles were coming from.

"We wanted to come up with methods that could be duplicated anywhere in North America — to measure the sources, pathways and fates of those various particles ... so that we could standardize a definition of the problem," said Warner Chabot, executive director of the San Francisco Estuary Institute, an independent science think tank whose board draws both from regulating agencies and those being regulated for water quality, as well as public interest groups.

"The goal was to provide the data and the science to define and quantify the microplastic problem and inform policy solutions."

Researchers collected anchovies and smelt from six sites in the bay and found they had higher particle counts — particularly of man-made microfibers — than those tested in more undeveloped areas. These prey fish are a critical link between contamination in sediment and seawater and the rest of the food web — an indicator of exposure to larger predators and ultimately humans.

Eight wastewater treatment plants in the Bay Area were also examined. More than 90 million microparticles are discharged into the ocean every day through the facilities, the report said.

Sediment samples were also collected from 20 sites. Scientists found that many microplastics do indeed sink and accumulate on the seafloor, and that the highest concentrations of microparticles were in areas that received large volumes of wastewater and stormwater discharges. Public attention and scientific study, they said, need to focus beyond just the plastic floating on the surface.

Scientists were also taken aback by the sheer amount of particles coming from stormwater runoff, as well as the “black rubbery fragments” that made up almost half of all the particles collected from these samples.

“No one had looked at all the water rushing off the streets during rainfall events to see whether that had plastics in it,” said estuary institute scientist Rebecca Sutton, the study’s lead author. “That makes all that driving we do something to think about, not just in the Bay Area, but any setting where there are cars.”

Researchers in California have been working on documenting the presence of microplastics since as early as the 1990s. Studies by the Southern California Coastal Water Research Project found that tiny pre-production plastic pellets, or “nurdles,” have become a ubiquitous presence in Southern California beach sand.

The SCCWRP is [now working](#) with officials across the state to standardize the way microplastics are measured and studied. There’s been growing movement on the issue since two state Senate bills, signed into law in September 2018, called for the State Water Quality Control Board [to develop](#) plans for quantifying microplastic particles in drinking water by 2021, and for the Ocean Protection Council [to come up with](#) a statewide strategy on the problem.

At a [gathering](#) Wednesday in Berkeley, top state environmental regulators, policymakers and scientists examined the latest findings. They talked about the need for better filters in washing machines that could trap microfibers, and the benefits of more advanced filtration at wastewater treatment plants

Eliminating plastic at its source will always be the ultimate, though somewhat unrealistic, solution. While people can stop using plastic straws, states can ban microbeads and companies can redesign their shrink wrap, reducing the world’s dependence on automobiles is a tougher nut to crack.

“The answer to many of these stormwater deposits is ... thinking about public transit, getting people out of their cars — all the things that we need to do anyway are just exacerbated by this issue,” said Jared Blumenfeld, who heads the California Environmental Protection Agency.

“Making this report actionable is about legislation, it’s about individual behavior change, it’s about more corporate responsibility. Together, we can make a big change.”

Another idea discussed Wednesday was the use of so-called rain gardens and other nature-based infrastructure that can trap polluted runoff before it reaches the ocean. Designed to remove well-known toxics and metals — while bringing more nature back into the city — a local rain garden was found to capture more than 90% of the microplastics.

“The role of greening cities becomes part of the overall solution.... It’s all part of a complex dance,” Chabot said. “Plastic pollutes the air we breathe, the water we drink, the food we eat. Plastics are a big part of the climate change problem.... Since California is the fifth-biggest economy on Earth, we have the potential to lead the planet with solutions.”

(B) **And tire microplastics, vehicle brake dust, and road paint particles as carriers of heavy metals in Environment** International Vol 30 Issue 8 October 2004 p. 1009-1017 by Kouji Adachi and Yoshiaki Tainosho

<https://www.sciencedirect.com/science/article/pii/S0160412004000868?via%3Dihub>

Abstract

Tire dust is a significant pollutant, especially as a source of zinc in the urban environment. This study characterizes the morphology and chemical composition of heavy metal particles embedded in tire dust and traffic-related materials (brake dust, yellow paint, and tire tread) as measured by a field emission scanning [electron microscope](#) equipped with an energy dispersive [X-ray spectrometer](#) (FESEM/EDX). In 60 samples of tire dust, we detected 2288 heavy metal particles, which we classified into four groups using cluster analysis according to the following typical elements: cluster 1: Fe, cluster 2: Cr/Pb, cluster 3: multiple elements (Ti, Cr, Fe, Cu, Zn, Sr, Y, Zr, Sn, Sb, Ba, La, Ce, Pb), cluster 4: ZnO. According to their morphologies and chemical compositions, the possible sources of each cluster were as follows: (1) brake dust (particles rich in Fe and with trace Cu, Sb, and Ba), (2) yellow paint (CrPbO₄ particles), (3) brake dust (particulate Ti, Fe, Cu, Sb, Zr, and Ba) and heavy minerals (Y, Zr, La, and Ce), (4) tire tread (zinc oxide). When the chemical composition of tire dust was compared to that of tire tread, the tire dust was found to have greater concentrations of heavy metal elements as well as mineral or [asphalt](#) pavement material characterized by Al, Si, and Ca. We conclude that tire dust consists not only of the debris from tire wear but also of assimilated heavy metal particles emitted from road traffic materials such as brake lining and road paint.

Ways to access the current vehicle water pollution include implementing the San Francisco Estuary Institute's approach and combine it with the approach of assaying the microplastics for heavy metals as did Adachi and Yoshiaki.

And as far as global warming is concerned, the environmental assessment needs to include several daily water temperature, pH, oxygen, and dissolved CO₂ measurements at representative fixed sites and depths, since aquatic organisms have livable water quality ranges and specific habitats

If improved survivability and healthiness of all stages of aquatic organisms in the Willamette River is to be improved as a goal of the river cleanup, then current vehicle pollution, current pesticide and herbicide pollution, and a suite of water quality parameters need to be included in addressing Willamette River pollution.

Comment Form

*Portland Harbor Natural Resource Damage Assessment
Draft Supplemental Restoration Plan and Environmental Assessment*

Thank you for taking the time to comment on the Draft Supplemental Restoration Plan and Environmental Assessment. Before including your address, telephone number, email address, or other personal information, please be aware that your entire comment, including any personal information you provide, will become part of the public administrative record. The Trustee Council will not consider anonymous comments, so you must provide a name and your city and state. The Trustee Council will address public comments in the Final Supplemental Restoration Plan and Environmental Assessment.

Please use the form below, and email it to portlandharbor.nrda@gmail.com. Comments received after September 14, 2020 will not be considered. The email address can accept comments up to 25 megabytes in size. If needed, the comment form may also be mailed to the address below and must be received by September 14, 2020.

Lauren Senkyr, NOAA Restoration Center
C/O Parametrix
700 NE Multnomah Street, Suite 1000
Portland, OR 97232

Commenter's Name (required):

Todd Slater

Street Address (optional):

City, State (required):

Exton, PA

Email (optional):

todd.slater@total.com

Organization (optional, if any):

Legacy Site Services LLC, agent for Arkema Inc.

No.	Page # or "General"	Paragraph / Figure / Table	Comment (please use multiple boxes for long comments)
019	1	Section 2.1.5, Pages 20-24	Arkema Inc., through its agent Legacy Site Services LLC, continues to raise its concern regarding the technical appropriateness of the Trustee Council's application of the the Hylebos Waterway Habitat Equivalency Analysis (HEA) model as an effectively identical boilerplate for assessing Portland Harbor Superfund Assessment Area (PHAA) injury. In the case of the Hylebos, the service loss benchmarks are derived for marine water using marine benthic organisms following the Apparent Effects Threshold (AET) approach. These values, specifically as they relate to the Trustees' Substances of Concern (SOCs) other than PAHs and PCBs, are not appropriate for assessing the less saline conditions and organisms present in the Willamette River. Site-specific data should be used for determining benchmarks applicable to the PHAA.
020	2	Section 2.1.5, Pages 20-24	The Trustee Council has not provided the technical justification describing how they convert an exceedance of a chemical screening value for sediment to a percent service loss for benthic organisms. The methodology relied upon to perform this conversion for the Hylebos Waterway, adopted by the Trustee Council for the PHAA, relies upon a number of highly subjective statistical inferences that have not been subject to independent peer-review. The process is subjective because there is no formal quantitative method or test to correlate or convert the percent service loss that might occur with a chemical exceedance to a benchmark for sediment. In addition, the Trustee Council has not publicly made available adequate documentation it relied upon to make its conversion.
021	3	Section 3.1 Figure 3	Significant effort has recently been expended to update the PHAA database to support preliminary design elements for remediation under CERCLA and reported in the Pre-Remedial Design Investigation and Baseline Sampling Documents. These additional data provide higher sampling density in several areas, including areas adjacent to restoration project locations depicted by the Trustee Council in Figure 3 and in baseline areas. Arkema Inc., through its agent Legacy Site Services LLC, believes the more complete context of these additional data should be included by the Trustee Council in order to update and make current their estimations of service loss and attendant compensatory restoration.

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Portland General Electric
121 SW Salmon Street · Portland, Ore. 97204

September 11, 2020

Lauren Senkyr
NOAA Restoration Center (C/O Parametrix)
700 NE Multnomah Street, Suite 1000
Portland, OR 97232

Re: Portland Harbor Draft Supplemental Restoration Plan and Environmental Assessment

Dear Ms. Senkyr:

022

Portland General Electric Company (PGE) is submitting our general comments to the Portland Harbor Draft Supplemental Restoration Plan and Environmental Assessment. PGE agrees with the document's conclusions and feels the preferred alternative of the Restoration Bank Credit Alternative is the best alternative to spur habitat restoration throughout Portland Harbor. We agree that this approach will provide the most flexibility to the Trustees to promote habitat projects and provides responsible parties sensible opportunities to resolve their liabilities and move forward. PGE appreciates the efforts the Trustees have made to address natural resources damages in Portland Harbor.

Sincerely,

A handwritten signature in cursive script that reads "Christopher Bozzini".

Christopher Bozzini, P.E.
Senior Manager, Environmental Services Group
Portland General Electric Company



Date: September 14, 2020

From: Bob Sallinger, Conservation Director, Audubon Society of Portland

To: Lauren Senkyr, NOAA Restoration Center

Re: Portland Harbor Draft Supplemental Restoration Plan and Environmental Assessment

Dear Ms. Senkyr,

Thank you for the opportunity to comment on the Portland Harbor Draft Supplemental Restoration Plan and Environmental Assessment. Audubon has been engaged with the protecting and restoration of Portland harbor for decades. Remediating the harm done by contaminants released into Portland Harbor is of great importance to our 17,000 members in the Portland Metro Area. The following are our comments on the Draft Supplemental Restoration Plan and Environmental Assessment (“Restoration Plan”).

1. **We urge the Trustee Council to strive to make the Natural Resources Damage Assessment process (NRDA) more transparent and accessible to stakeholders.**

NRDA is a challenging process for stakeholders to track and participate in. It is complex, much of it is opaque and it is marked by long periods where there is no public engagement at all. We would note that this comment period was only 30 days in length, comes at the end of summer in the midst of the covid crisis and historic fires. We would urge the NRDA Trustees to work towards a more transparent and inclusive public engagement process. Specifically:

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- Providing a detailed timeline and road map for the process going forward including highlighting future opportunities for public engagement.
- Providing longer comment periods.
- Providing periodic updates to community stakeholders, perhaps as part of the community stakeholder meetings hosted by EPA.

2. **We are generally supportive of the Restoration Bank Credit Alternative approach recommended by Natural Resource Trustees with the caveat that the Trustees could still adopt a PRP led project in the future, subject to public notice and comment.**

We understand that the Trustees only received applications for the five restoration bank projects that were ultimately incorporated into the preferred alternative and so consideration of other projects was not feasible. However, we believe that there are other potentially viable and beneficial projects within the Superfund Assessment Area and Broader Focus Area and that it is important to maintain the ability to incorporate additional projects in the future provided there is adequate public review.

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3. **We are pleased the four out of the five Restoration banks are located in Portland Harbor Assessment Area as opposed to the Broader Focus Area.** We believe that it is critical to focus restoration within the actual area where the majority of pollution occurred. Portland Harbor

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remains the most degraded stretch of the entire 187-mile long Willamette River System. Every listed salmonid that utilizes the Willamette River must pass through the Assessment Area. NRDA provides a unique opportunity to make this stretch of river more hospitable to wildlife passage and the best use of NRDA funds is within the Assessment Area. We are concerned that of the four projects located within the Assessment Area, all four are concentrated toward the end. We would urge the Trustee Council to continue working with PRPs and others to try and identify 2-3 additional projects in the central and southern portions of the assessment area to create a system of anchor habitats throughout the entire assessment area.

4. **While West Hayden Island is outside the Assessment Area (it is located in the Broader Focus Area), we would still encourage the Trustee Council to pursue this 823-acre site for a potential mitigation project.** Its size, location in close proximity to Portland Harbor, multiple habitat types (including bottomland hardwood forests, grasslands, wetlands, and shallow water habitats) and the fact that it is located almost entirely within the floodplain, present a unique opportunity for protection and restoration. As per prior discussions with the Trustee Council, we believe that any restoration project at this site must preserve intact forest habitat, focus on habitat improvement as opposed to habitat conversion, and be contingent upon protection of the entire parcel.

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5. **We urge the Trustees to ensure that NRDA related obligations are written in a manner that makes it explicitly clear that these activities are specifically mandated to mitigate for resources and ecosystem services that have been harmed as a result of release of contaminants into the environment and are not a surrogate for or in lieu of other natural resource programs, mandates and obligations.** There has been a pattern over the past two decades of Superfund PRP's pointing to NRDA as an alternative to local natural resource protection programs mandated under Statewide Land Use Planning Goals as well as other local and state regulations. Examples of PRPs attempting to use restoration project to "double count" NRDA restoration obligations to cover other mandates include both the North Reach River Plan adoption process and the West Hayden Island annexation process. While neither process was completed, both are anticipated to be revisited in coming years. Given recent history, it is critical that the Superfund Trustees ensure Superfund PRPs are not able to utilize NRDA credits as a way to avoid other environmental obligations and liabilities.

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6. **The NRDA process should consider potential negative impacts to native species caused by clean-up actions that rely heavily on capping rather than removal:** The January 2017, final record of decision on the remedy for Portland Harbor relies heavily on capping to address existing contamination. We urge the Trustees to take into account the fact that further hardening of the banks and shallow water habitat of Portland Harbor will make passage for a variety of native fish and wildlife species even more tenuous than it is today. At the same time that the NRDA process is accounting for past impacts to species, the clean-up action, to the degree that it relies heavily on capping, could further degrade the habitat quality of this section of the river and undermine the restoration efforts enabled by NRDA. In essence we could have a situation where NRDA gives back with one hand and Superfund Clean-up actions take back with the other. It is critical that NRDA and Superfund clean-up actions be carefully coordinated such that the overall health of the Portland Harbor is restored for native fish and wildlife to conditions that would mirror the state of the river had not the contamination occurred.

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7. **We are concerned that mitigation for lost recreation opportunities and other human uses remains inadequately addresses and would like to better understand how this situation will be remedied going forward:**

The Restoration Plan acknowledges that it will develop a separate process to address recreational uses. It states:

In the Programmatic Restoration Plan, the Trustee Council also identified goals and objectives related to restoration of recreation and other human uses that may have been injured by long-term contamination in the PHAA. This Draft Supplemental Restoration Plan is focused on the Trustee Council's decision-making and environmental impacts analysis associated with the restoration of ecological resources. The Trustee Council will identify a separate process to select appropriate restoration to compensate for recreational losses and will set aside a portion of recoveries to fund those actions. When this occurs, restoration planning and environmental analysis for recreational restoration will be conducted by the Trustee Council and shared with the public for review and comment.¹

The plan also notes that the Trustee Council has only collected data on impacts to fishing as opposed to other uses such as wildlife watching, hiking, etc. It states:

Recreation damages were estimated for four types of recreational activities: (1) resident species fishing, (2) sturgeon fishing, (3) anadromous species fishing (including salmon and excluding sturgeon), and (4) boating. Other recreation uses (e.g., non-motorized boating, wildlife viewing, hiking) potentially impacted by Portland Harbor contamination were considered but not quantified, primarily because existing data for those activities are limited.²

We believe that it is critical that the Trustees capture and seek compensation for the full range of recreational and community values that have been lost over the years as a result of contamination. We are deeply concerned that the only recreational use that has been quantified to date are fishing related uses. This should include not only those additional uses listed in the Restoration Plan (non-motorized boating, wildlife viewing and hiking) but also such other activities such as swimming, use of beaches, picnicking, general recreational activities, community gatherings etc. along the river, etc. As an organization that has worked on issues related to the North Reach for decades, it is clear to us from the feedback we receive from both local residents and people throughout the region, that many people do not utilize Portland Harbor because they view it as highly contaminated and risky. We would recommend that the following:

- Provide the community with a clear timeline for how and when recreational uses will be addressed.
- Develop a methodology to identify all significant uses that were restricted due to contamination in Portland Harbor.

¹ Restoration Plan at Page 31.

² Restoration Plan at Page 24.

029

- Develop a methodology to determine the appropriate compensation that should be paid by PRPs.
- Create an opportunity for meaningful community input into how recreation mitigation funds will be spent. This should go beyond simply looking at the projects to be funded to also include contracting practices, hiring practices, the types of jobs created, etc. to ensure that benefits for directly impacted communities are maximized.

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8. **We urge the Trustees to consider how community benefits can be maximized in all aspects of the NRDA Process:** The restoration bank alternative may be sufficient to achieve ecological goals but it is also a model that removes much of the financial benefit of constructing and managing these projects from the local community. The profits that accrue from these projects go to large corporate entities that are located outside of our communities and in many cases outside of our state. We would urge the Trustees to consider giving priority to banks that prioritize local hiring (particularly of minority and woman owner businesses) for materials, supplies and implementation of the projects as well local hiring in the ongoing management and operations of projects. We would also urge the Trustees to encourage restoration banks to contribute a portion of profits made at these banks back into immediately impacted communities through some sort of grant program or similar funding mechanism. Finally we would urge the Trustees to continue to consider additional mitigation projects that meet also meet the above listed criteria.

We greatly appreciate your consideration of these comments.

Respectfully,



Bob Sallinger
Conservation Director
Audubon Society of Portland

Jennifer Hughes

From: Lauren Senkyr - NOAA Federal <lauren.senkyr@noaa.gov>
Sent: Monday, September 14, 2020 8:22 PM
To: portlandharbor.nrda@gmail.com
Subject: Fwd: Draft Supplemental Restoration Plan - and EA

Follow Up Flag: Follow up
Flag Status: Flagged

----- Forwarded message -----

From: Travis Williams <travis@willametteriverkeeper.org>
Date: Mon, Sep 14, 2020 at 7:11 PM
Subject: Draft Supplemental Restoration Plan - and EA
To: Lauren Senkyr - NOAA Federal <lauren.senkyr@noaa.gov>

Dear Lauren -

I submit these comments on behalf of Willamette Riverkeeper on the Draft Supplemental Restoration Plan and EA.

We are in support of the Preferred Alternative. The benefits to the Willamette River are pretty clear, even with some of the ambiguities related to credits. The projects that have been outlined in the Plan are pretty solid, and we have visited all of them.

031

The overall benefit to the Willamette's ecological health is measurable and much needed. In our view, we need much more restoration to occur in this area over the coming years.

Given our time working on Portland Harbor, we would have appreciated the opportunity to review this document. We are not sure how that process with other non profits went forward, especially given our understanding of this site. It may have also made sense during the time of Covid, with most of the comment period in August, to have a bit longer timeline to provide comments.

Thanks,

Travis Williams
Riverkeeper & Executive Director

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Portland, OR 97214
Main office: 503-223-6418
Cell: 503-890-1683

South Valley Office:
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www.willametteriverkeeper.org

www.willamettewatertrail.org

www.paddleoregon.org

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Lauren Senkyr

Habitat Restoration Specialist

NOAA Restoration Center

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