

Draft Restoration Plan and Environmental Assessment for the Arrowhead Refinery Site

St. Louis County, Minnesota

Prepared by:

U.S. Fish and Wildlife Service

March 2, 2022



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List of Acronyms

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
EPA	Environmental Protection Agency
DOI	U.S. Department of Interior
MDNR	Minnesota Department of Natural Resources
MPCA	Minnesota Pollution Control Agency
NEPA	National Environmental Policy Act
NRDA	Natural Resource Damage Assessment
PAH	Polynuclear aromatic hydrocarbons
PCB	Polychlorinated biphenyls
RP/EA	Restoration Plan/Environmental Assessment
Service	U.S. Fish and Wildlife Service
VOC	Volatile organic compounds

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Cover Photo

1972 Aerial image of the Arrowhead Refinery, courtesy of the University of Minnesota John R. Borchert Map Library

Executive Summary

The purpose of this draft Restoration Plan/Environmental Assessment (RP/EA) is to describe how a Trustee for the Arrowhead Refinery Natural Resource Damage Assessment and Restoration (NRDAR), the Department of Interior represented by the United States Fish and Wildlife Service, will utilize funds obtained through a claim for natural resource damages for the restoration of natural resources injured by the release of hazardous substances at the Arrowhead Refinery Site. The Arrowhead Refinery Site is located within the St. Louis River watershed in Hermantown, St. Louis County, Minnesota. The former waste oil recycling facility operated from 1961-1977 and generated approximately 7,000 cubic yards of highly acidic, metal-laden sludge. The sludge was disposed of on the property and eventually migrated off site, contaminating wetland habitat south of the facility. Injuries to natural resources within the 40 acre Site include migratory birds and their supporting habitats from exposure to polychlorinated biphenyls, phenols, cyanide, lead, barium, arsenic, cadmium, chromium, and selenium.

The State of Minnesota, represented by the Minnesota Department of Natural Resources and the Minnesota Pollution Control Agency and the United States Fish and Wildlife Service developed a claim for natural resource damages at the Site and recovered their claim through a Consent Decree. The Arrowhead Refining Company and other responsible parties were required to pay \$91,000 for damages associated with the palustrine forested wetland and \$62,400 for damages associated with the palustrine emergent wetland. The Minnesota Department of Natural Resources completed the palustrine forested wetland restoration in 1997. Due to the accumulation of interest, the Service now has approximately \$100,000 for the restoration of migratory birds and associated palustrine emergent wetland habitat and related administrative costs. Due to extensive injury and remedial actions at the site, the Trustee determined off-site restoration is required.

Consistent with the United States Department of the Interior Comprehensive Environmental Response, Compensation, and Liability Act NRDAR regulations and the National Environmental Policy Act, the Trustee evaluated three alternatives for completing the type of restoration sufficient to compensate the public for natural resource injuries. Based on selection factors including location, technical feasibility, cost effectiveness, provision of natural resource services similar to those lost due to contamination, and net environmental consequences, the Trustees have identified Alternative Three as the preferred alternative. Alternative Three consists of the restoration and enhancement of Grassy Point, a 160-acre impaired wetland complex adjacent to the St. Louis River and approximately 5 miles from Lake Superior. This alternative was evaluated in the St. Louis River Interlake Duluth Tar Final RP/EA¹. The specific restoration actions being considered in this draft RP/EA include non-native vegetation management and replanting the area with native trees, shrubs, forbs, and grasses. If selected, this alternative will provide foraging and nesting habitat for migratory birds, the injured resource.

This draft RP/EA will be available for review and comment for a period of 30 days in accordance with 43 Code of Federal Regulations (C.F.R.) § 11.81(d)(2). The Trustee will address and respond to public comments as part of the final RP/EA.

¹<https://fws.gov/project/st-louis-river-interlakeduluth-tar-site-natural-resource-damage-assessment-and-restoration>

1 Introduction

The U.S. Fish & Wildlife Service (Service), acting as the Natural Resource Trustee on behalf of the U.S. Department of the Interior (DOI), has prepared this draft Restoration Plan/Environmental Assessment (Draft RP/EA) pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, (42 U.S.C. § 9601 et seq.) and the DOI CERCLA Natural Resource Damage Assessment (NRDA) regulations (43 C.F.R. Part 11). The Service has approximately \$100,000 in recovered natural resource damages. This Draft RP/EA presents the range of natural resource restoration alternatives the Service is considering to compensate the public for natural resources injured from the release of hazardous substances at the Arrowhead Refinery Site (Site). The Service proposes Grassy Point Revegetation as the preferred restoration alternative.

1.1 Purpose and Need for Restoration

The purpose of the proposed actions are to restore, rehabilitate, replace, or acquire the equivalent of the trust resources (migratory birds and their supporting habitats) injured by the release of hazardous substances, pursuant to the requirements of the Consent Decree, and applicable federal and state laws and regulations. Due to the extensive contamination and remedial actions at the Site, the Trustees determined the Site cannot be restored to its previous condition as a palustrine forested wetland. However, the Trustees identified existing state lands consisting of even-aged, mature, white cedar stands that could be stocked with white cedar seedlings to enhance habitat for species injured from the loss of habitat at the Site. The MDNR's Division of Parks and Recreation completed the palustrine forested wetland restoration in 1997. To restore the natural resource injuries associated with the palustrine emergent wetland, the Trustees determined off-site wetland restoration is required.

The recovered restoration funds will allow for the development, implementation, and oversight of activities that will restore the equivalent of 40 acres of palustrine emergent wetland migratory bird habitat within the St. Louis River watershed.

1.2 Site History and Description

The Site is located within the St. Louis River watershed in Hermantown, St. Louis County, Minnesota (Figure 1). The 10-acre former oil recycling facility was situated on a palustrine forested, scrub-shrub wetland and is now surrounded by commercial, residential, and public use. The Arrowhead Refinery Company, incorporated in 1961, operated a waste oil recycling facility at the Site from 1961-1977. Operation of the facility generated approximately 7,000 cubic yards of highly acidic, metal-laden sludge, which was disposed of in a 2-acre unlined lagoon on the property and wastewater ditch in a wetland area. Analyses conducted by the State of Minnesota revealed ground water and surface water near the site was contaminated with polychlorinated biphenyls (PCBs), phenols, cyanide, lead, barium, arsenic, cadmium, chromium, and selenium. The U.S. Environmental Protection Agency (EPA) placed the Arrowhead Refinery site on the National Priorities List in August 1983 and issued a Record of Decision in September 1986 (EPA, 1986).

Analysis of monitoring wells and surface water by the State of Minnesota in 1983 confirmed that contaminants had migrated from the Site. Investigations found volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), carcinogenic PAHs, petroleum hydrocarbons, and metals in the source material, soil, and sediment. In addition, the pH of the sludge was found to be between one and two.

Over the years, seasonally high surface waters flowing in a southwesterly direction across the Site entered the sludge lagoon, mixed with its constituents, and carried contaminants into a 20 acre palustrine emergent wetland south of the Site. Construction of the final remedy took place between 1991 and 1996 and included excavation, treatment and off-site disposal of sludge and filter cake, excavation and off-site disposal of soils and sediments, and groundwater extraction and treatment.

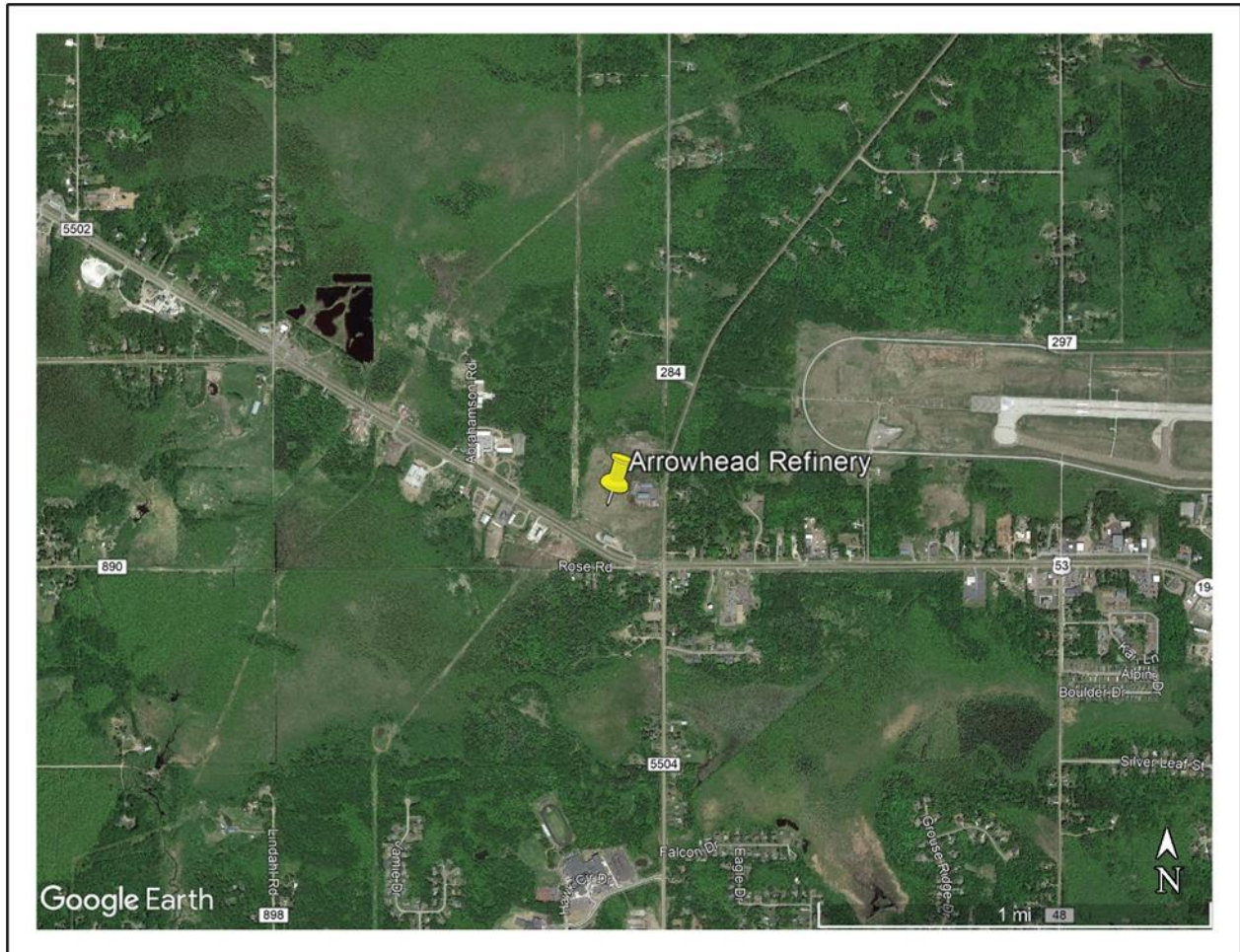


Figure 1: Location of the Arrowhead Refinery in Hermantown, St. Louis County, Minnesota

1.3 Summary of Natural Resource Injuries

Site contamination and subsequent remedial activities resulted in extensive injury to the palustrine forested, scrub-shrub wetland, and migratory birds that utilized the habitat. The wetland likely provided breeding habitat for American woodcock (*Scolopax minor*), sharp-shinned hawks (*Accipiter striatus*), and numerous species of warblers (*Dendroica spp.*), thrushes (*Catharus spp.*), flycatchers (*Empidonax spp.*), Vireos (*Vireo spp.*), and sparrows (*Helospiza spp.*). The contamination in the palustrine emergent wetland south of the site also injured migratory birds and their supporting habitat. Palustrine emergent wetlands are important for early spring feeding species such as mallards (*Anas platyrhynchos*), blue-winged teal (*Anas discors*), and great blue herons (*Ardea herodias*). Northern harriers (*Circus cyaneus*) nest almost exclusively on the surface of emergent wetlands (Lewis, 1992).

1.4 Authority

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 United States Code [U.S.C.] § 9601 *et seq.*) establishes a liability regime for the release of hazardous substances that injure natural resources and the ecological and human use services those resources provide. Pursuant to CERCLA, designated federal and state agencies, federally recognized tribes, and foreign governments act as trustees on behalf of the public to assess injuries and plan for restoration to compensate for those injuries. CERCLA further instructs the designated trustees to develop and implement a plan for the restoration, rehabilitation, replacement, or acquisition of the equivalent of the injured natural resources under their trusteeship (hereafter collectively referred to as “restoration”). CERCLA defines “natural resources” to include land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources belonging to, managed by, held in trust by, appertaining to, or otherwise controlled by the United States (including the resources of the fishery conservation zone established by the Magnuson-Stevens Fishery Conservation and Management Act), any state or local government, any foreign government, any tribes, or, if such resources are subject to trust restriction or alienation, any member of an Indian tribe (42 U.S.C. § 9601(16)). Regulations providing guidance to the Trustees on how to implement, in general, the NRDAR processes are contained in Chapter 43 of the Code of Federal Regulations (C.F.R.), Part 11.

1.5 Summary of Settlement

The State of Minnesota, represented by the Minnesota Department of Natural Resources (MDNR) and the Minnesota Pollution Control Agency (MPCA), and the Department of Interior, represented by the U.S. Fish and Wildlife Service (Service), developed a claim for the natural resource damages at the Site and serve as co-trustees. The claim reflects the estimated costs associated with replacing and maintaining the lost or diminished habitat value of the equivalent of 30 acres of palustrine forested wetland and 40 acres of palustrine emergent wetland, giving a total of 70 replacement acres. A multiplier was applied to the damaged acres to account for thirty plus years of diminished habitat use.

The Trustees recovered their claim through a Consent Decree entered by the United States District Court for the District of Minnesota on May 24, 1995. The portion of the Consent Decree dealing with settlement of natural resource damage claims required Arrowhead Refining Company and other responsible parties to pay a total of \$153,400 as reimbursement for state and federal natural resource damages. The Trustees divided the settlement, with \$91,000 going to the MDNR for damages associated with the palustrine forested wetland and \$62,400 going to the Service for damages associated with the palustrine emergent wetland. Due to the accumulation of interest, the Service now has approximately \$100,000 for the restoration of migratory birds and their associated habitats and related administrative costs.

1.6 Public Review and Participation

Public participation and review are an integral part of the restoration planning process and are specifically required in the DOI NRDAR Regulations. Additionally, NEPA and its implementing regulations require that federal agencies fully consider the environmental impacts of their proposed decisions and that such information is made available to the public. To comply with the statutory and regulatory processes, the Trustee will solicit comments on this draft RP/EA for 30 days, ending on April 2, 2022. Comments can be provided to Reena Bowman via email (reena_bowman@fws.gov) or mail (U.S. Fish and Wildlife Service, Ecological Services Field Office, 4101 American Blvd. East, Bloomington, MN

55425). The Trustee will address public comments and will document responses to those comments in the Final RP/EA. A notice of availability and an electronic version of the draft RP will be posted on the FWS Arrowhead Refinery NRDA website: <https://fws.gov/project/arrowhead-refinery-hermantown-minnesota-natural-resource-damage-assessment-and-restoration>

1.7 Administrative Record

The administrative record contains the official documents pertaining to the case settlement, restoration planning, and restoration implementation. The administrative record for this case is located on the FWS Arrowhead Refinery NRDA website: <http://fws.gov/project/arrowhead-refinery-hermantown-minnesota-natural-resource-damage-assessment-and-restoration>

2 Proposed Restoration Alternatives

The Trustee's overall restoration objective is to compensate the public for natural resources (migratory birds and their supporting habitat) injured by the release of hazardous substances at the Site. To achieve the restoration objective, the natural resource trustee must identify and evaluate restoration alternatives. The CERCLA NRDA regulations provide ten factors to consider when evaluating restoration alternatives (43 C.F.R. § 11.82(d)). CERCLA restoration plans should include an evaluation of each restoration alternative using these factors, and any additional criteria the Trustee determine to be useful. This evaluation contributes towards the Trustee's identification of preferred restoration alternatives in the draft restoration plan, and the Trustee's selection of restoration alternatives for implementation in the final restoration plan.

2.1 Restoration Alternatives Evaluated

The Trustee evaluated the following restoration alternatives:

1. Alternative One: No Action (Natural Recovery)
2. Alternative Two: Kingsbury Bay
3. Alternative Three: Grassy Point Revegetation

2.2 Restoration Evaluation Criteria

Section 11.82(d) states that, when selecting the restoration alternative to pursue, the authorized official shall evaluate each of the possible alternatives based on all relevant considerations, including the following factors:

1. Technical Feasibility: Are the technology and management skills necessary to implement the restoration alternative well known and does each element of the restoration alternative have a reasonable chance of successful completion in an acceptable time period? 40 C.F.R § 11.14(qq).
2. Costs Benefit Comparison: Compare the expected costs of the restoration alternative to the expected benefits from the restoration alternative. The full range of costs and benefits should be considered, including both the recovery of natural resources and any benefits to public use.
3. Cost Effectiveness: When two or more restoration activities provide the same or a similar level of benefits, the least costly activity providing that level of benefits will be selected. 40 C.F.R. § 11.14(j).

4. Results of Any Actual or Planned Response Actions: Consider the direct and indirect impacts resulting from any action to clean up the site on the restoration alternative.
5. Potential for Additional Injury: Will the restoration alternative cause further harm to injured natural resources or other resources (including short-term, long-term and indirect impacts). Alternatives that avoid or minimize adverse impacts to the environment and other resources are preferred.
6. Natural Recovery Period: Compare the time required for injured natural resources to recover if no restoration is undertaken, beyond the response actions performed or anticipated, with the time required for injured natural resources to recover if the restoration alternative is implemented. 40 C.F.R. § 11.73 (a)(1).
7. Ability of Resources to Recover With or Without Restoration: Compare the injured natural resources' ability to recover on their own and the natural resource recovery associated with the restoration alternative.
8. Adverse Effects to Public Health and Safety: Analyze whether a restoration alternative would pose unacceptable risks to public health and safety.
9. Consistency with relevant federal, state, and tribal policies: Is the restoration alternative consistent with all relevant federal, state, and tribal policy?
10. Compliance with applicable federal, state, and tribal laws: Does the restoration alternative comply with all applicable federal, state, and tribal laws? Is there ongoing compliance that must be completed before the alternative can be implemented?

2.3 Compliance with National Environmental Policy Act (NEPA) and Other Authorities

Actions taken by federal Trustees to restore natural resources or services under CERCLA are subject to the National Environmental Policy Act (NEPA, 42 U.S.C. § 4321 et seq.), and the regulations guiding its implementation at 40 C.F.R. Parts 1500 through 1508. NEPA and its implementing regulations set forth a process of environmental impact analysis, documentation, and public review for federal actions, including restoration actions. Specifically, NEPA provides a mandate and a framework for federal agencies to consider all reasonably foreseeable environmental effects of their proposed actions and to inform and involve the public in their decision making process.

In addition to NEPA, the following environmental laws, regulations, and executive orders were considered in the restoration planning process as they may impose limits or standards for restoration activities:

- Federal Water Pollution Control Act (Clean Water Act, 33 U.S.C. § § 1251, et seq.),
- Fish and Wildlife Coordination Act (16 U.S.C. § § 661-666c),
- Migratory Bird Treaty Act (16 U.S.C. § § 703-712),
- EO 11990: Floodplain Management,
- EO 11990: Protection of Wetlands,
- EO 13186: Responsibilities of Federal Agencies To Protect Migratory Bird

2.4 Evaluation of Alternative One: No Action (Natural Recovery) Alternative

2.4.1 Project Description

Under this alternative, the Trustee will not pursue restoration projects to address migratory birds and their supporting habitats injured by the release of hazardous substances beyond the already completed remediation, and any further restoration would instead occur through natural recovery alone.

2.4.2 CERCLA NRDAR Evaluation

As this alternative requires no action, the alternative is technically feasible, has no cost, is consistent and compliant with applicable federal, state, and tribal laws, and has no direct and indirect impacts. Remedial actions completed by state and federal authorities were designed to protect human health and the environment from future damage, therefore this alternative poses no potential for additional environmental injury or adverse effects to public health and safety. However, it is unlikely that the injured resources, migratory birds and their associated habitats, will recover on their own within a reasonable timeframe. The “No Action Alternative” would not meet the Trustee’s purpose and need of restoring injuries to natural resources and related services caused by hazardous substances at the Site through the implementation of restoration activities, as it would not accomplish restoration objectives.

2.5 Evaluation of Alternative Two: Kingsbury Bay Restoration

2.5.1 Project Description

This alternative consists of additional restoration within Kingsbury Bay, an 80-acre shallow bay adjacent to the St. Louis River and approximately 5.7 miles upstream from Lake Superior. Over the past century, a significant amount of sediment has been deposited in Kingsbury Bay from its watershed, which has reduced fish and wildlife habitat as well as allowed for the establishment of monotypic stands of non-native plants (e.g., narrow-leaved cattail). This area has also become less desirable to gamefish species due to open water conversion to upland, the shallow depth of the remaining open water, and the thick stands of submerged vegetation.

The restoration of Kingsbury Bay was identified as the preferred alternative in the Final St. Louis River Interlake/Duluth Tar Natural Resource Damage Assessment Restoration Plan and Environmental Assessment (St. Louis River Interlake/Duluth Tar Final RP/EA¹). Construction of the project was completed in November 2021 with funding from the Great Lakes Restoration Initiative, Minnesota Outdoor Heritage Fund, and the St. Louis River Interlake/Duluth Tar NRDA. For the purposes of this Draft RP/EA, this alternative will consist of additional restoration activities, of the same nature as the activities evaluated in the St. Louis River Interlake/Duluth Tar Final RP/EA, to create and protect additional open water habitat. The primary action will be the additional removal of sediments and non-native vegetation from the bay and contouring to develop shallow sheltered embayment bathymetry and open water habitat.

2.5.2 CERCLA NRDAR Evaluation

The newly created open water habitat would provide some benefit to piscivorous migratory birds, but would not significantly increase nesting opportunities for migratory birds or restore similar habitat types that were injured at the Site. The project is technically feasible as similar restoration activities were recently completed without any technical issues.

It is unlikely that the alternative will result in adverse impacts to public health and safety and is consistent and compliant with all relevant federal, state, and tribal policies. During the initial planning phase of the restoration project partially funded by the St. Louis River Interlake/Duluth Tar NRDA, the MDNR completed a Minnesota Environmental Quality Board Environmental Assessment Worksheet (EAW) and solicited for public comment. The EAW process determined an Environmental Impact Statement is not required as the project does not have the potential for significant environmental effects. It is likely that the same determination would apply to this restoration alternative as the restoration activities are similar to those analyzed in the EAW.

2.6 Evaluation of Alternative Three: Grassy Point Revegetation

2.6.1 Project Description

This restoration alternative consists of the restoration and enhancement of Grassy Point, a 160-acre impaired wetland complex adjacent to the St. Louis River and approximately 5 miles from Lake Superior. Grassy Point was the site of two 19th century sawmilling operations that deposited over 500,000 cubic yards of logs, lumber slabs, and sawdust wood waste directly into the estuary. Wood waste became scattered across Keene Creek outlet, terrestrial habitats, and wetlands, where deposits up to 16 feet deep remain across roughly 75 acres. This resulted in impairments to wetlands and shorelines due to altered site hydrodynamics, and converted open water wetlands to shallow marsh dominated by invasive species.

The restoration of Grassy Point was evaluated in the St. Louis River Interlake/Duluth Tar Final RP/EA¹. The first phase of the restoration was completed in November 2021 and consisted of addressing historic wood waste and placing material in strategic areas to create beneficial habitat features. Phase 1 was completed with funding from the Great Lakes Restoration Initiative and the Outdoor Heritage Fund.

Phase 2 consists of the revegetation of created and enhanced habitat features, with an emphasis on creating foraging and nesting opportunities for migratory birds. The primary action will be non-native vegetation management and replanting the area with native trees, shrubs, forbs, and grasses. Portions of Phase 2 are anticipated to commence in 2022 with partial funding from US Fish and Wildlife Service's Coastal Program, Great Lakes Restoration Initiative, National Fish and Wildlife Foundation – Sustain our Great Lakes, and the Minnesota Outdoor Heritage Fund. For the purposes of this Draft RP/EA, this alternative will consist of a portion of the restoration activities associated with Phase 2. If selected, this alternative will allow for the implementation of all of the Phase 2 design elements.

2.6.2 CERCLA NRDAR Evaluation

The restoration of native vegetation will provide benefits to injured trust resources and their habitats that cannot be achieved at the Site through natural recovery alone. The revegetation plan will include native species that will provide foraging and nesting opportunities for migratory birds. The project is technically feasible as the full restoration designs for Phase 2 has been developed with input from local and regional technical experts. The project is cost effective as it leverages several sources of funding. In addition, the benefits associated with this alternative far outweigh the costs. This alternative will result in a habitat area larger than the area injured at the Site, greatly increase public recreational

¹<https://fws.gov/project/st-louis-river-interlakeduluth-tar-site-natural-resource-damage-assessment-and-restoration>

opportunities, and complements the City of Duluth's plans for future revitalization of adjacent project areas.

Furthermore, it is unlikely that the alternative will result in adverse impacts to public health and safety and is consistent and compliant with all relevant federal, state, and tribal policies. During the initial planning phases, a Minnesota Environmental Quality Board Environmental Assessment Worksheet (EAW) was completed and available to the public for comment. The EAW process determined an Environmental Impact Statement is not required as the project does not have the potential for significant environmental effects. All applicable permits and permissions will be obtained prior to commencing revegetation activities.

3 Environmental Assessment

Actions taken by the Trustees to restore natural resources or services under CERCLA and other federal laws are subject to NEPA. NEPA requires the Trustee to evaluate whether proposed restoration actions would have beneficial and/or adverse impacts to physical, biological, socio-economic, and cultural environments. The evaluation includes the context (i.e., area of impacts) and duration. Chapter 3 of the St. Louis River Interlake/Duluth Tar Final RP/EA¹ provides a description of the area to be affected by the Alternatives Two and Three presented in this Draft RP/EA and chapter 6 describes the environmental consequences of Alternatives Two and Three. The information and analysis is relevant, was found to be acceptable, and it is incorporated here by reference. A summary of the information and analysis is presented below.

3.1 Affected Environment

Restoration alternatives two and three are located within the lower St. Louis River Estuary (Figure 2). The lower estuary is approximately nine miles from the Arrowhead Refinery Site and is part of several ongoing restoration and conservation initiatives (e.g., City of Duluth's St. Louis River Corridor Initiative, Minnesota Department of Natural Resources' St. Louis River Initiative, and U.S. Environmental Protection Agency's Area of Concern Program).

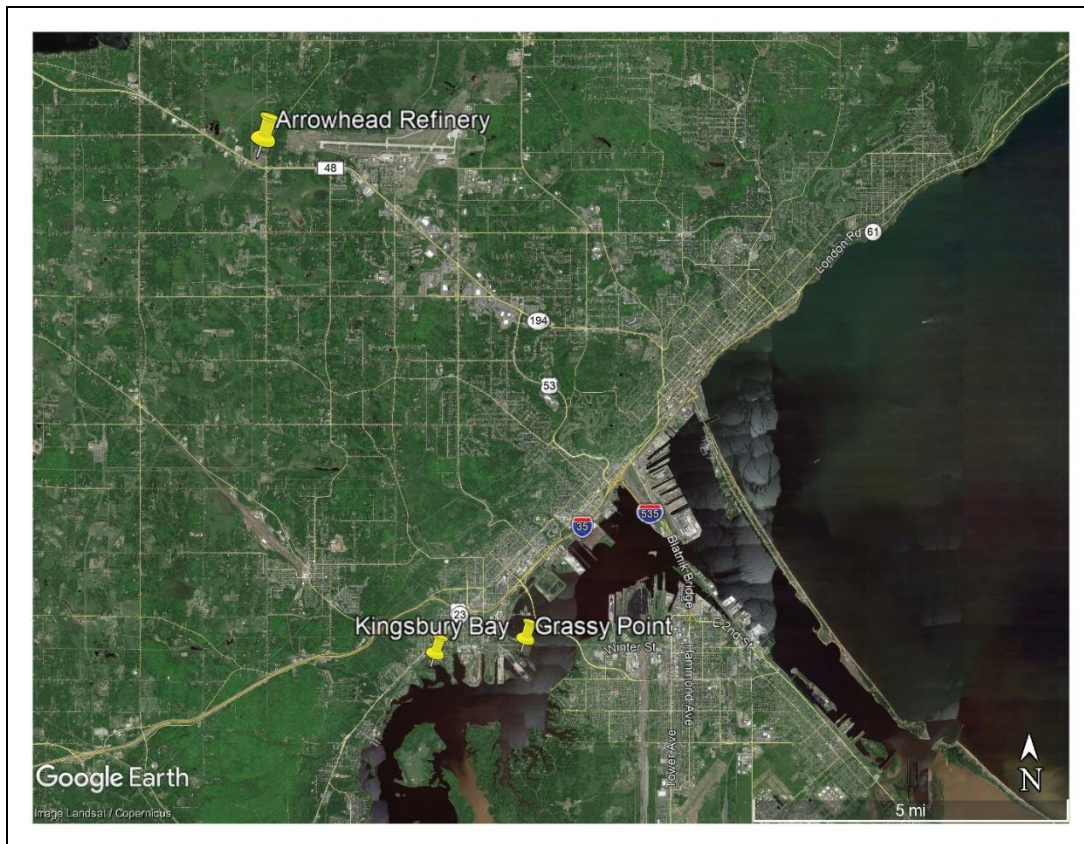


Figure 2. Location of Restoration Alternatives Two and Three in relation to the Arrowhead Refinery

3.1.1 Physical Environment

The St. Louis River is the largest United States tributary to Lake Superior, the largest and deepest of the Great Lakes. The St. Louis River drains approximately 3,634 square miles of northeastern Minnesota and northwestern Wisconsin. The lower 21 river miles of the St. Louis River include a 12,000 acre freshwater estuary that supports unique ecosystems as well as the largest harbor and international port on the Great Lakes. The estuary and its tributaries are unusual in representing such a variety of habitat types that support a large and diverse assemblage of native fish species. In addition, the extensive baymouth bar shelters the harbor from the high-energy wind and waves of Lake Superior, allowing wetland habitats to develop. This combination of systems, the freshwater estuary and baymouth bar, are virtually absent elsewhere in the interior of North America.

3.1.2 Natural Resources and Biological Environment

The St. Louis River Estuary is approximately 12,000 acres in size, and is characterized by numerous backwater areas and bays, as well as islands. Parts of the upper estuary are relatively undeveloped, while the lower estuary consists of a number of industrial uses interspersed with vacant or undeveloped tracts.

Individual habitat types present within the St. Louis River estuary include aquatic, baymouth bar complexes surrounding upland forests, swamps, and inland marshes. These habitat types support

numerous bird, fish, and other wildlife species. During spring and fall migrations, enormous aggregations of birds utilize habitat in the Lower St. Louis River for stopover functions. Sheltered embayment habitats provide critical spawning and/or nursery habitat for many fish species. This habitat type also provides foraging opportunities for fish and refuge, nesting, and feeding habitat for wading birds, waterfowl, and semi-aquatic birds and mammals. Deep water channel areas within the St. Louis River estuary provide many critical habitat services for fish including a component of daily movement patterns, sanctuary for light-sensitive species, foraging areas, and overwintering habitat.

3.1.3 Socio-Economic Resources

The St. Louis River spans six counties across two states: St. Louis, Lake, Itasca, Aitkin, and Carlton in Minnesota and Douglas County in Wisconsin. Development pressure is also moderate, with some farms, timberland, resorts, and lakeshore lands parceled for recreation, lake, or country homes. Within Duluth, Cloquet (Minnesota), and Superior (Wisconsin) (the main population centers in this area), major industries and commercial activity include heavy and light manufacturing plants, food processing plants, woolen mills, lumber and paper mills, cold storage plants, fisheries, grain elevators, and oil refineries. Regionally, Duluth also serves as the center for banking, retail, and medical care for northern Minnesota, northern Michigan, and northwestern Ontario (Canada). In addition, numerous jobs are dependent on the port itself, which is a designated Foreign Trade Zone and is one of the largest grain-handling facilities in the world.

3.1.4 Cultural and Historic Resources

The Ojibwe people have been living in Minnesota for centuries. The main source of information about this time period is through oral tradition, which describes a westward migration of tribal bands from the east coast, through the Great Lakes region, finally settling in Michigan, Wisconsin, and Minnesota (FDL 2016). At the time of first recorded contact with Europeans in 1622, FDL tribal members lived a hunter-gatherer lifestyle that fished in the lakes and rivers during summer and hunted in the forests during winter (FDL 2016). Upon the defeat of the English during the American Revolutionary War, the United States opened up its western frontier for settlement. This resulted in an influx of settlers who intended to log timber and establish farmsteads (FDL 2016). In an effort to maintain peace, a series of treaties were signed that eroded Native American ownership of ancestral lands. These treaties gave rise to the reservations that exist today, including the Bois Forte Band of Chippewa, Fond du Lac Band of Lake Superior Chippewa, and Grand Portage Band of Lake Superior Chippewa. Under the Treaty of 1854, bands ceded lands in what is now present-day northeastern Minnesota. In exchange, treaty rights to hunt, fish, and gather were retained. The exercise of treaty rights continues today in the 1854 Ceded Territory.

In the early years of European contact, the fur trade was the main industry in the area. As the fur trade declined in the early 1800s, some companies shifted to commercial fishing operations on Lake Superior; exploiting lake trout (*Salvelinus namaycush*) and whitefish (*Coregonus clupeaformis*) (SLRCAC 2002). By the latter half of the 19th century, the cities of Superior and Duluth were well-established, and shipping and railroad infrastructure had been built to expedite shipment of natural resources extracted from the area (e.g., iron ore, lumber, and grain) (SLRCAC 2002). These early industries continued to grow, leading to the establishment of several rock quarries, steel manufacturers, extensive logging and milling operations, and securing the harbor's position as a major shipping point for Midwestern grain (SLRCAC 2002).

3.1.5 Landscape-Scale Ecological Stressors

Environmental stressors that related to the ecological function of the St. Louis River and estuary include Great Lakes water levels, water quality, air quality, and invasive species. Long-term models predict a net decrease in Great Lakes water levels, along with increases in extreme weather events (Hayhoe et al. 2010, Glick et al. 2011). Water quality in the St. Louis River has significantly improved since the passing of the Clean Water Act in 1972 and due to advances in wastewater collection and water treatment. However, the Lower St. Louis River has consistently reported impairments due to mercury in fish, PCBs in fish, *Escherichia coli*, chloride, and temperature as well as aquatic life indicators, such as fish and invertebrate assemblages and lack of cold water assemblage (MPCA 2013).

Throughout previous decades, the overall air quality in the St. Louis River watershed has been very good and has not been associated with any known health-related effects, symptoms, or adverse impacts (FERC 1995). However, localized, ground-level pollution (e.g., due to carbon monoxide, particulates, lead, sulfur dioxide, nitrogen oxides, and volatile organic compounds) does occur in localized areas related to major industrial sources and due to atmospheric dispersion arising from the cities of Duluth and Superior (FERC 1995).

Aquatic invasive species have been a substantial contributor to dramatic alterations in Lake Superior and its aquatic communities. Currently, zebra mussels (*Dreissena polymorpha*), Eurasian watermilfoil (*Myriophyllum spicatum*), and spiny waterfleas (*Bythotrephes longimanus*) are found in the St. Louis River (SLR Alliance 2016). Non-native plant species, such as narrow-leaved cattails, also pose a problem to the St. Louis River estuary by limiting biodiversity through the growth of monotypic stands. Riparian and wetland areas are the most vulnerable to the impacts of these invasive species. In addition, changing ecological conditions, such as declining lake levels and increasing air temperature, may increase the vulnerability of natural systems to invasive species and favor their continued spread and proliferation (NOAA 2010).

3.2 Evaluation of Alternative One: No Action (Natural Recovery) Alternative

3.2.1 Environmental Consequences of Alternative One

Alternative one requires no action. Therefore, this alternative will not result in direct or indirect impacts to the physical, biological, socio-economic, and cultural environments

3.2.2 Conclusion of Alternative One

Alternative one does not provide the ecological, recreational, and socio-economic benefits described in the other alternatives. Due to the lack of additional habitat functionality provided through restoration and/or preservation actions in the St. Louis River watershed, this alternative would not positively impact fish and other wildlife, or improve the ecological and human use services provided by wetland habitats. Therefore, the “No Action Alternative” is not a preferred restoration alternative.

3.3 Evaluation of Alternative Two: Kingsbury Bay Restoration

3.3.1 Environmental Consequences of Alternative Two

This alternative may result in direct and indirect, localized, moderate adverse impacts to the environment through dredging, vegetation removal, and recreational access improvements. However, these impacts are expected to be outweighed by the major, long-term, localized and broader benefits expected post-construction.

The most substantial adverse effects to biota due to the construction of this alternative are expected to be experienced by benthic fauna and infauna. Some disruption to birds, fish, and terrestrial mammals is expected due to the presence of humans and noise from heavy machinery. However, these adverse impacts are expected to be temporary and would be outweighed by the beneficial impacts of the project in the form of improved habitat areas.

There would likely be a temporary, adverse socio-economic impact during construction of the alternative, as recreational activities at the site are expected to decrease during that time. The beneficial impacts would be long-term. Recreational access improvements would draw people to the area post-construction and in the long-term.

3.3.2 Conclusion of Alternative Two

These factors indicate that Alternative Two would not result in significant environmental consequences. However, this alternative is not preferred as the project will largely restore fish populations and habitat and will result in secondary benefits to migratory birds, the injured resource.

3.4 Evaluation of Alternative Three: Grassy Point Revegetation

3.4.1 Environmental Consequences of Alternative Three

Alternative three would result in similar physical adverse and beneficial impacts as described under Alternative two.

Mammals, birds, and fish would be adversely impacted in the short-term and would likely avoid the area during construction and revegetation. However, the beneficial impacts of this project are expected to outweigh these adverse impacts in the long-term. Humans are likely to avoid the Grassy Point area during construction and restoration, which may adversely impact the local socio-economic climate in the short-term. However, increased access opportunities in the form of trails and improved aesthetics from native revegetation are expected to be long-term.

3.4.2 Conclusion of Alternative Three

These factors indicate that Alternative Three would not result in significant environmental consequences. This alternative is the preferred alternative as the project will provide nesting and foraging habitat for migratory birds, the injured resource.

4 Preferred Alternative

Contamination at the Site resulted in injuries to migratory birds and supporting habitat. The objective of any restoration action under CERCLA is to restore or replace natural resources and the services such resources provide to the benefit of the American public. To meet that objective, the benefits of a restoration project must be associated with the natural resource injured and/or lost as a result of hazardous substance releases. The proposed preferred restoration alternative presented in this RP/EA is Alternative Three Grassy Point Revegetation in the St. Louis River Estuary. The project is expected to provide foraging and nesting opportunities for migratory birds, the injured resource, and enhance recreational opportunities for the public.

5 Restoration Monitoring

If Alternative Three, the preferred restoration alternative, is selected for implementation, a monitoring program will be developed and implemented to evaluate whether the goal to restore, rehabilitate, replace, or acquire the equivalent of migratory birds and their supporting habitat has been met. The monitoring program for the project will include provisions for project monitoring and reporting to ensure the specific project objectives and restoration actions are conducted as intended. Such provisions include performance standards and criteria for the restoration action, guidelines for implementing corrective actions, and a schedule for frequency and duration of monitoring.

6 Agencies, Organizations, and Parties Consulted

The following agencies, organizations, and parties were consulted during the development of the draft RP/EA:

- Minnesota Department of Natural Resources
- Minnesota Land Trust

7 References

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