

Implementation Plan for the St. Louis River Estuary Habitat Focus Area

National Oceanic and Atmospheric Administration

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Photo Credit: Heather Stirratt (Pokegama Bay, St. Louis River)

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Acknowledgments

This plan was developed by the Saint Louis River Estuary Implementation Planning Team:

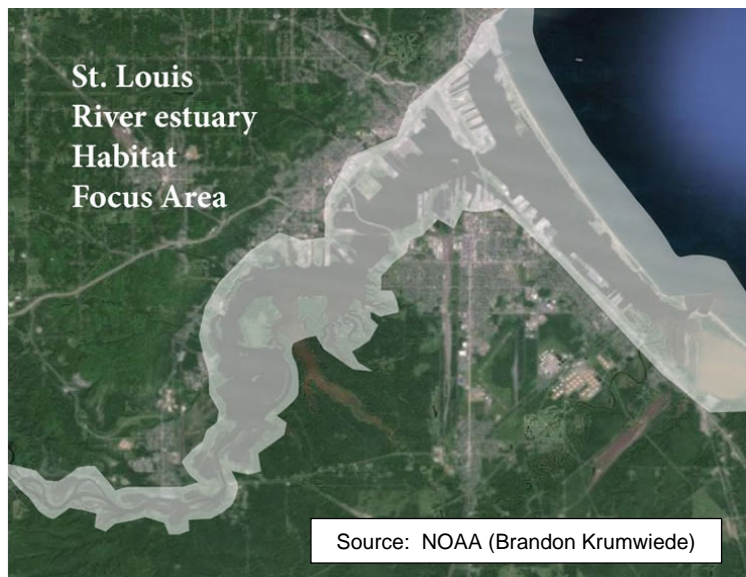
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Executive Summary

Since 2012, as part of its Habitat Blueprint, NOAA has been identifying Habitat Focus Areas. These focus areas represent high priority areas for long-term habitat science and conservation, and allow NOAA to



maximize the benefits of investments in marine resources and coastal communities within targeted areas. NOAA selected the St. Louis River estuary as one of two Habitat Focus Areas in NOAA's Great Lakes region.

Why? The St. Louis River estuary, which runs along the border of Minnesota and Wisconsin, draining into western Lake Superior, is a major tourism draw and home to the nation's busiest and largest bulk inland port. The estuary extends approximately 21.8 river miles, which includes the port.¹ The St. Louis River watershed has endured decades of habitat degradation from industrial discharges, forestry harvesting and processing practices, and other human

activities. The resulting environmental impairments have reduced the resilience of the local coastal communities, degraded water quality and habitat health, and impacted public use and coastal tourism.

What Does NOAA Hope to Achieve?

NOAA will make contributions to the measurable improvement of beneficial use impairments as specified in the St. Louis River Remedial Action Plan and all associated updates (i.e., [Roadmap to Delisting – 2013](#)):

- Loss of fish and wildlife habitat
- Degradation of fish and wildlife populations
- Degradation of benthos

NOAA will take a coordinated, cross-line office approach to the implementation of projects. In doing so, NOAA has identified the following objectives in the St. Louis River estuary:

1. Address loss of fish and wildlife habitat through the funding of targeted restoration projects, as well as the delivery of data, products, and services throughout the estuary, particularly to support delisting of the Area of Concern²;
2. Enhance resilience by reducing the impact of flooding through improved planning and water management strategies;
3. Increase coastal tourism, access, and recreational opportunities, and
4. Provide opportunities for training, education and outreach.

¹ MN State Water Trail Map. Online water trail information and maps can be found at mndnr.gov/watertrails.

² The St. Louis River is listed as an "area of concern" under the international Great Lakes Water Quality Agreement, meaning that environmental degradation has impaired the area's ability to support aquatic life.

NOAA is currently working with partners and local communities on efforts such as

- Restoration projects in the area of concern
- Conducting pre- and post-monitoring of restoration projects to look at ecological results—to assess impacts on fisheries, water quality, and changes in water-surface elevations
- Green infrastructure (Duluth, Minnesota) and place-based land conservation projects (Minnesota and Wisconsin Coastal Programs; Lake Superior National Estuarine Research Reserve)
- Vegetation migration, water levels, and climate change impacts monitoring via sentinel site (Pokegama Bay)
- Developing habitat- and species-specific [story maps](#) specific to the St. Louis River coastal communities

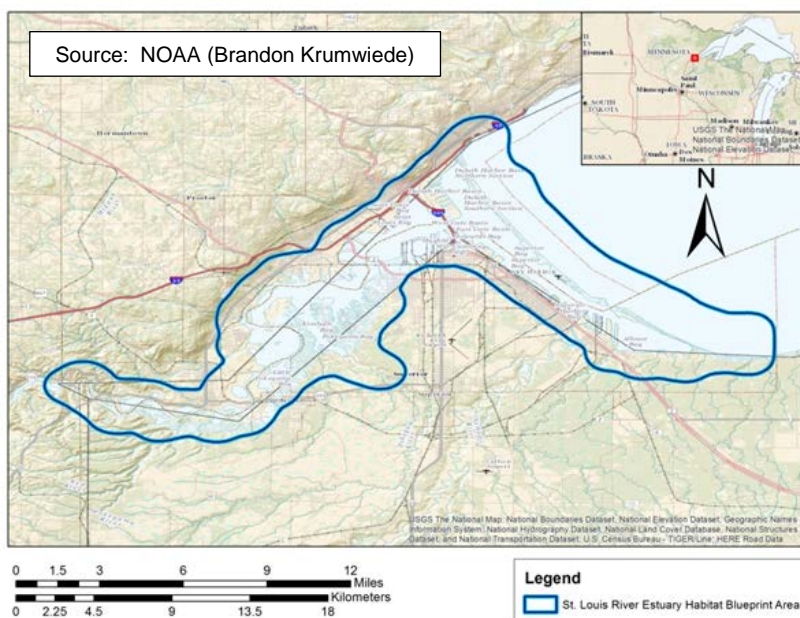
What Will NOAA Do?

Through the Habitat Focus Area, NOAA will strengthen and expand its work with partners and local communities, and engage the wide range of offices across NOAA, on these efforts. This implementation plan outlines a path forward to achieve the objectives for the St. Louis River Estuary Habitat Focus Area. The plan describes the major projects and activities that will be undertaken over the next three to five years to advance these objectives; identifies the measures of success by which progress will be determined; and highlights partnerships based on shared interests that support these objectives in the St. Louis River estuary watershed.

Introduction

NOAA selected the Saint Louis River Estuary watershed as a Habitat Focus Area because of the significance of habitat challenges in the area and the strong track record of federal, state, and local collaboration in the St. Louis River.

The St. Louis River is the largest tributary to Lake Superior, which is in turn the largest lake in the world by surface area. The St. Louis River sits between the urban areas of Duluth, Minnesota, and Superior, Wisconsin, on the western edge of Lake Superior. It is positioned at the headwaters of the Great Lakes and is a world-class estuarine ecosystem.³ The river contains unique wetland and wildlife habitat, as well as the largest freshwater port in North America. The setting is often described as a wilderness in the heart of an urban area. Although it contains many areas that resemble pristine wilderness, the St. Louis River has a history of pollution and habitat degradation. Today, the St.



Louis River estuary is listed as a U.S. Environmental Protection Agency area of concern, and many partners are working in the area to complete the Remedial Action Plan and remove the St. Louis River from the list of contaminated sites around the Great Lakes basin.

NOAA has made significant investments in the St. Louis River from base-funded NOAA programs and from externally funded sources such as the Great Lakes Restoration Initiative (GLRI). These programs offer unique project and partnership leveraging opportunities in the area, including partnerships with the coastal zone management programs, Sea Grant programs, academic institutions, and regional partnerships from both states.

A Watershed in Need

The St. Louis River runs along the border of Minnesota and Wisconsin, draining into western Lake Superior. The area is a major tourism draw and home to the country's busiest and largest bulk inland port. The estuary extends approximately 21.8 river miles, which includes the port. Historically, the area was a center for lumber and paper production and, unfortunately, has a long history of environmental degradation and pollution. Discharges from industrial sites, chemical spills, and other sources have

³ The St. Louis River contains the world's largest freshwater sand bar, 11 priority wetlands, six important habitat areas, 12 important habitat sites, and two Wisconsin Scientific and State Natural Areas. The combination of these unique ecosystems within the St. Louis River estuary is very unusual in Lake Superior, the Upper Midwest, the Great Lakes region, and the world (http://lsnerr.uwex.edu/Research/Docs/meetings/Feedback_Superior_white-ppr.pdf).

contaminated sediments, water, plants, and wildlife in the estuary, leaving a legacy of toxic substances that include mercury, dioxins, polychlorinated biphenyls, and polycyclic aromatic hydrocarbons, along with extensive habitat alteration and degradation.

This area is listed as an “area of concern” under the international Great Lakes Water Quality Agreement, meaning the environmental degradation has impaired the area’s ability to support aquatic life. The St. Louis River was designated as an area of concern (AOC) as a result of nine beneficial use impairments identified in the area:



Photo Credit: [Courtney Ray on Twitter](#)

- Restrictions on fish and wildlife consumption
- Excessive loading of sediment and nutrients
- Degradation of fish and wildlife populations
- Beach closings
- Fish tumors or other deformities
- Degradation of aesthetics (removed in 2014)
- Degradation of benthos
- Restriction on dredging activities
- Loss of fish and wildlife habitat

Recently, American Rivers designated the St. Louis River as one of the 10 most-endangered rivers in the country. This new designation was spurred by increasing mining interests along the river’s edge and watershed.

The ultimate goal of designating the St. Louis River estuary as a Habitat Focus Area is to help improve the habitat to the point that the area will again support robust fish and wildlife populations, moving it closer to being removed from the list of AOCs while simultaneously enhancing community resilience, increasing tourism, and providing additional educational opportunities in the St. Louis River Estuary.

What Can NOAA Do?

NOAA’s expertise in flood and weather forecasting, integrated monitoring, habitat protection and restoration, stakeholder education, and coastal management are important components of the ongoing restoration efforts.

NOAA has identified the following objectives in the St. Louis River estuary:

1. Address loss of fish and wildlife habitat through the funding of targeted restoration projects, as well as the delivery of data, products, and services throughout the estuary, particularly to support delisting of the AOC;
2. Enhance resilience by reducing the impact of flooding through improved planning and water management strategies;
3. Increase coastal tourism, access, and recreational opportunities, and
4. Provide opportunities for training, education and outreach.

A Plan for Action – Building on a Strong Foundation to Address Key Objectives

NOAA’s Role in the St. Louis River Estuary

NOAA has an active role and strong mandates to work in the St. Louis River estuary. Multiple NOAA offices join an already-active community of partners working on these issues in the estuary. Within

NOAA, the National Ocean Service, NOAA Fisheries, and the National Weather Service have begun a number of projects that are expected to yield measurable results in the next three to five years. This timeframe was selected as a way to accelerate progress in the near-midterm toward achieving habitat outcomes. Other partners in the restoration effort include the Lake Superior National Estuarine Research Reserve, the Wisconsin and Minnesota Coastal Programs, Minnesota and Wisconsin Sea Grant Programs, and NOAA's sentinel site for climate monitoring.

- NOAA's Office for Coastal Management funds **coastal management programs**, including the Minnesota and Wisconsin Coastal Programs adjacent to the St. Louis River, which address a wide range of issues, including coastal development, water quality, public access, habitat protection, energy facility siting, governance and planning, coastal hazards, and climate change.
- NOAA Fisheries **Restoration Center** is providing funding for a multi-phase marine debris removal project at Radio Tower Bay. Approximately \$2.1 million in Great Lakes Restoration Initiative funds were directed to this area in 2010 and 2013. NOAA's **Office of Response and Restoration** is assisting by providing technical expertise on removal of the woody debris.
- NOAA Fisheries **Restoration Center** is providing \$400,000 of Great Lakes Restoration Initiative funding to complete construction of a spawning habitat enhancement and shoreline restoration project at Chambers Grove under a partnership with the Minnesota Department of Natural Resources.
- NOAA Fisheries **Restoration Center** also provided financial support in the restoration of wetland, riparian, and coastal habitat on Hog Island following contaminated sediment remediation.
- NOAA, in partnership with the University of Wisconsin, funds the 16,697-acre **Lake Superior National Estuarine Research Reserve** on the Wisconsin side of the river where baseline data are collected on environmental conditions. The reserve is one of two reserves representing a freshwater estuary on the Great Lakes. This reserve also houses the first NOAA-funded, freshwater sentinel site to monitor and track aquatic vegetation migration with changes in climate over time.
- NOAA's **Center for Operational Oceanographic Products and Services** maintains a water-level gauge station at Duluth, Minnesota.
- The **National Geodetic Survey** records elevation benchmarks throughout the St. Louis River vicinity and beyond.
- Minnesota and Wisconsin **Sea Grant** programs have both been quite active in the estuary in the past 30 years. Most recently, the two Sea Grants have teamed up to support larger, joint projects in the estuary, including citizen-scientist projects.
- Both Minnesota and Wisconsin **Sea Grant** are involved in various committees working to delist the AOC and have also invested heavily in outreach and educational efforts involving the estuary.
- **Great Lakes Bay Watershed Education and Training (B-WET)** partners with the University of Wisconsin-Superior and the Lake Superior National Estuarine Research Reserve to provide students with hands-on environmental education experiences at the St. Louis River.
- In 2010, NOAA supported a land acquisition project through the **Coastal and Estuarine Land Conservation Program (CELCP)** that protected nearly 4,000 acres along the Nemadji River. The property is now owned and managed by Douglas County, Wisconsin.
- Duluth and Superior are part of the NOAA National Estuarine Research Reserve System Climate Vulnerability survey, the **NOAA Climate Program Office Sectoral Applications**

Research Program (SARP) evaluation of climate change impacts to the port, and were involved in the Climate-Ready Great Lakes initiative.

- NOAA's **National Weather Service** maintains and operates a weather forecasting office in Duluth, Minnesota, (adjacent to the St. Louis River) and a river forecasting center (which covers the St. Louis River for forecasting purposes).
- NOAA's **National Centers for Environmental Information** provides ready access to current and historical atmospheric, hydrologic, limnological, and geophysical data collected from satellites and many *in situ* environmental monitoring instruments located in the vicinity of the St. Louis River basin and estuary.

NOAA is an active participant in the St. Louis River management and decision-making framework, outlined in the Remedial Action Plan. NOAA representatives regularly participate in AOC federal partner, site team, and coordination meetings. Maintaining consistent engagement with these groups has resulted in broad buy-in for NOAA-led project work in the St. Louis River, which includes the following:

Great Lakes Restoration Initiative Project Funding

- The NOAA Office for Coastal Management, in partnership with the Wisconsin Coastal Program and the City of Superior, Wisconsin, is planning (pending funding approval) to restore dune habitat on Wisconsin Point through a combination of shoreline restoration, dune revegetation, and shoreline restoration. The project once completed will eliminate 16 turnouts and enlarge four turnouts using low-impact design techniques; install elevated boardwalks for beach access over the dunes; restore and revegetate the dunes and forested areas damaged by foot traffic; and stabilize the shoreline along Allouez Bay.
- The NOAA Office for Coastal Management, in partnership with Lake Superior National Estuarine Research Reserve, has funded a sentinel site. Located in Pokegama Bay, the site was established for monitoring nearshore habitat health and aquatic vegetation migration.
- The NOAA Office for Coastal Management, in partnership with Minnesota Sea Grant and the City of Duluth, will develop a framework for assessing the economic costs of flood impacts, the types of green infrastructure opportunities to help reduce these impacts, and the costs and benefits of using green infrastructure.
- NOAA's Office of Response and Restoration is currently working with state partners in the St. Louis River to develop a data system with query and spatial visualization tools that help managers move the AOC toward delisting.

NOAA Restoration Center Project Funding

- The NOAA Restoration Center, in partnership with the Great Lakes Commission, funded restoration of wetland, riparian, and coastal habitat on Hog Island following contaminated sediment remediation.
- The NOAA Restoration Center is currently working with the Minnesota Department of Natural Resources and other partners to remove marine debris from Radio Tower Bay, part of the St. Louis estuary. The project will remove derelict pilings, dredge, and wood slabs, which will restore lake-bottom habitat, improve fisheries habitat, and increase recreational fishing opportunities.
- The NOAA Restoration Center is working with the Minnesota Department of Natural Resources through a partnership to enhance fish spawning habitat and restore shoreline at Chambers Grove. The work will provide important stream habitat for lake sturgeon, walleye, and smallmouth bass. The existing hardened shoreline will be restored to a natural condition while retaining recreational access to the river.

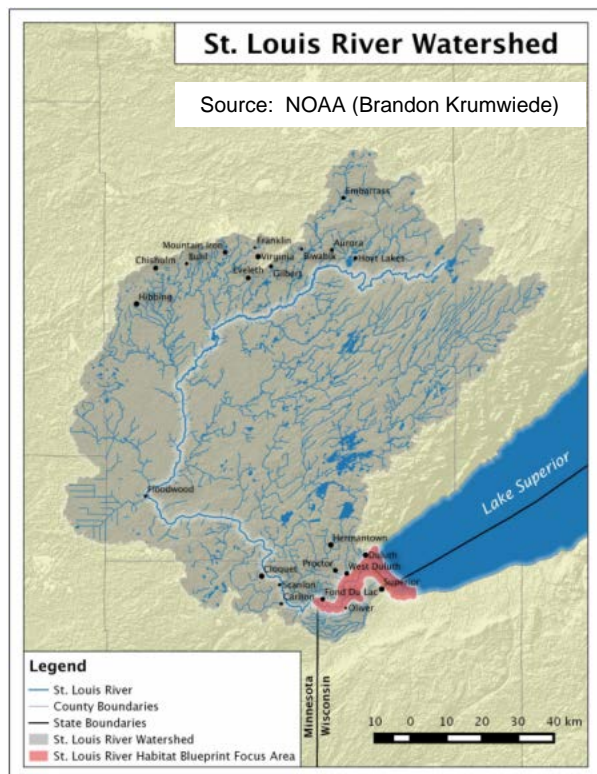
NOAA Office for Coastal Management Project Funding

- The Lake Superior National Estuarine Research Reserve works to improve the understanding of Lake Superior freshwater estuaries and coastal resources and to address the issues affecting them through an integrated program of research, education, outreach, and stewardship.
- Many Lake Superior projects were funded through Wisconsin’s and Minnesota’s Coastal Management Programs, including the reconstruction of the City of Superior’s Arrowhead Pier; construction of an outdoor classroom in Superior’s municipal forest; development of an inventory of Duluth’s forested areas; creation of a unified development code in Duluth; and sediment trap design for Miller and Coffee Creeks.
- Coastal Change Analysis Program provides high-resolution land use and land cover change data for the St. Louis River.
- The office created the St. Louis River Story Map – Sturgeon Story.

NOAA Office of Response and Restoration – Marine Debris Program Funding

- In partnership with the Office for Coastal Management, the NOAA Marine Debris Program has provided funding to the Lake Superior National Estuarine Research Reserve to develop an educational display on marine debris in the Great Lakes.

Collaboration – NOAA’s Partnerships in the St. Louis River Estuary



NOAA and the St. Louis River partners are committed to a watershed approach to conservation and restoration. Partnerships are focused on the connections between the river, estuary, and freshwater Great Lakes (Lake Superior) as well as how we can work together to better manage the St. Louis River estuary and recover threatened and endangered fish populations.

NOAA’s work on the St. Louis River also supports the Great Lakes Restoration Initiative, which is aimed at accelerating restoration work toward the ultimate delisting of all Great Lakes AOCs. This collaborative effort, in addition to the efforts made through other regional and national initiatives, offers a historic opportunity to improve access to nearly 192 miles of river and 12,000 estuary acres of critical fish and migrating waterfowl habitat.

Because the St. Louis River is a shared (regional) tributary to Lake Superior, many partner agencies are involved in decision-making, funding, contracting, and project management. A list of the

St. Louis River partners can be found in Appendix 1.

Existing Management Plans That Will Be Linked to This Effort

A variety of established management plans relate to the St. Louis River Implementation Plan. These are described below.

Coastal Zone Management Program

Minnesota and Wisconsin have coastal management programs approved by NOAA under the Coastal Zone Management Act. These programs address a wide range of issues, including [coastal development](#), [water quality](#), [public access](#), [habitat protection](#), [energy facility siting](#), and [climate change](#). The management plan for each state's coastal management program identifies areas of particular concern (APCs), which serve as guides for conservation activities and permitting. As part of the Coastal Zone Management Act's [Section 309](#) Coastal Zone Enhancement Grants program, Minnesota and Wisconsin have assessed and identified strategies to enhance their approved programs in one or more of the following areas: wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts of development, special area management plans, ocean/Great Lakes resources, energy and government facility siting, and aquaculture. Information about these coastal management programs can be found at <http://coast.noaa.gov/czm/mystate>, and copies of their Section 309 Assessments and Strategies can be found at: <http://coast.noaa.gov/czm/enhancement>.

National Estuarine Research Reserve System

The Lake Superior National Estuarine Research Reserve is one of a network of 28 protected areas that protect more 1.3 million acres of habitat in estuaries and coastal watersheds. The Reserve System seeks to

- Increase permanent protection and restoration of key areas in reserve watersheds to improve coastal habitat quantity, quality, and resilience to climate change impacts;
- Develop, demonstrate, and evaluate tools and practices at reserves that advance progress on habitat protection, water quality, and climate change impacts; and
- Expand biogeographic representation of the nation's estuaries in the Reserve System.

Each reserve has a management plan that includes land acquisition plans that prioritize inholdings and lands outside the reserve for potential acquisition, and where appropriate, habitat restoration plans. These plans must be revised every five years. The management plan for the Lake Superior Reserve can be found at: <http://lsnerr.uwex.edu/Docs/LSNERR-ManagementPlan.pdf>.

Coastal and Estuarine Land Conservation Program (CELCP)

To participate in this NOAA program, participating states develop a CELCP plan that identifies the priority coastal land conservation needs for coastal areas, including the values to be protected (e.g. priority habitat types or ecosystem values) and the geographic location of those priorities. The CELCP focuses on areas with significant ecological, conservation, recreational, historic, or aesthetic value. The priorities in CELCP plans support the objectives of the Coastal Zone Management Act, of which CELCP is a part, including protection of natural resources, such as wetlands, floodplains, estuaries, beaches, dunes, barrier islands, coral reefs, and fish and wildlife and their habitat, within the coastal zone, as well as areas benefiting the National Estuarine Research Reserve System. Wisconsin's CELCP identifies priority areas along the St. Louis Estuary and Lake Superior. The plan can be found at www.doa.state.wi.us/Divisions/Intergovernmental-Relations/Wisconsin-Coastal-Management/resources-and-links/coastal-and-estuarine-land-conservation-program.

Lakewide Management Plan (LAMP)

A Lakewide Management Plan (LAMP) is a plan of action to assess, restore, protect, and monitor the ecosystem health of a specific Great Lake. It coordinates the work of all government, tribal, and nongovernment partners working to improve the lake ecosystem. A public consultation process ensures that the LAMP is addressing the public's concerns. LAMPs exist for all five Great Lakes and are currently required to be updated on a five-year rotational schedule (e.g., Lake Superior's LAMP will be updated in 2015). More information on each of the existing LAMPs can be found at <http://epa.gov/greatlakes/lamp/index.html>.

Lake Superior Biodiversity Conservation Strategy

The [Lake Superior Biodiversity Conservation Strategy](#) was completed in February 2015. This Strategy provides a summary of the health of and threats to the biodiversity of Lake Superior, and presents a guide to implementing effective lakewide and regional conservation strategies.

St. Louis River Area of Concern Remedial Action Plan

As noted above, the St. Louis River is listed as an "area of concern" (AOC) under the international Great Lakes Water Quality Agreement, meaning the environmental degradation has impaired the area's ability to support aquatic life. It was designated as an AOC because of nine beneficial use impairments identified in the area. Each AOC, including St. Louis River, develops a remedial action plan to identify the actions needed to remove ben in order to delist the AOC. More information about the St. Louis River AOC, as well as the 2013 Roadmap to Delisting, can be found at www.epa.gov/greatlakes/aoc/stlouis/.

Great Lakes Restoration Initiative Action Plan

The Great Lakes Restoration Initiative (GLRI) was launched in 2010 to accelerate efforts to protect and restore the largest system of fresh surface water in the world—the Great Lakes.

During fiscal years (FY) 2015-2019, federal agencies will continue to use GLRI resources to strategically target the biggest threats to the Great Lakes ecosystem and to accelerate progress toward long-term goals for this important ecosystem.

GLRI Action Plan II summarizes the actions that federal agencies plan to implement during FY 2015-19. These actions will build on restoration and protection work carried out under the first GLRI Action Plan, with a major focus on

- Cleaning up Great Lakes Areas of Concern
- Preventing and controlling invasive species
- Reducing nutrient runoff that contributes to harmful and nuisance algal blooms
- Restoring habitat to protect native species

More information about GLRI can be found at <http://greatlakesrestoration.us>.

Great Lakes Land-Based Marine Debris Action Plan

Plastics and other litter, abandoned vessels, and derelict fishing gear have been a long-standing problem for the Great Lakes. To address this problem, the Great Lakes community worked together to produce the [Great Lakes Land-based Marine Debris Action Plan](#), the first of its kind for the region. The action plan provides scientists, governments, stakeholders, and decision makers with a roadmap for strategic progress to see that the Great Lakes, its coasts, people, and wildlife are free from the impacts of marine debris. The plan focuses on a mission to combat debris through an increased understanding of the problem, preventive actions, reductions in impacts, education and outreach, and collaborative efforts from diverse groups. The plan encompasses work that dedicated partners, including offices within NOAA and their affiliates, will undertake in the next five years (2014-2019).

Stakeholder Engagement and Communications Strategy

Regional partners have been engaged throughout the development of this implementation plan. Three discreet phases of partner and stakeholder engagement are outlined here. The first phase assesses St. Louis River estuary partner needs, while the second phase is intended to validate the needs previously expressed, digging deeper into how NOAA's expertise, products, and services could address those needs, and identification of strategies for possible deployment by NOAA to meet partner needs in the St. Louis River estuary. Finally, the third phase will ensure that NOAA continually involves its partners in St. Louis River projects as well as keep St. Louis River stakeholders apprised of implementation plans and progress in meeting Habitat Focus Area objectives.

Phase I: St. Louis River Estuary Needs Assessment

NOAA conducted a stakeholder engagement process to assess regional needs over a three-month period (September to November 2014). The goals for the engagement process were to document work that is already being done to avoid duplication of effort and to identify gaps and opportunities that NOAA is best suited to address. Recognition was given to the fact that NOAA cannot, and in some cases should not, be the single entity to address the needs identified through the needs assessment process. In total, NOAA interviewed 188 people from 68 organizations working in the watershed (see Appendix 1).

The report documents information on interviewing methods, stakeholder feedback, common ideas expressed, and a list of recommendations for NOAA to consider in the development of its implementation plan for the St. Louis River Habitat Focus Area. The report also contains a list of stakeholder organizations interviewed, as well as a suggested list of stakeholder organizations to interview in the future.

Five major themes were identified in the St. Louis River stakeholder engagement needs assessment, including 1) attitudes toward the river, 2) restoration work, 3) science, 4) education and outreach, and 5) recreation and economic connections to the estuary. A cross-walk was performed to assess NOAA's unique ability to address the needs expressed, and a series of recommendations were developed by a third-party contractor for NOAA's consideration in this implementation planning process. The recommendations provided are documented in Appendix 2.

Phase II: St. Louis River Stakeholder Engagement for Validation and Implementation Plan Development

Following the completion of the needs assessment, NOAA hosted annual Habitat Blueprint updates for St. Louis River stakeholders. These updates were built into the Lake Superior National Estuarine Research Reserves Annual St. Louis Summit venues. Presentations were made on two occasions to over 200 St. Louis River Summit participants, providing status updates on the Habitat Focus Area needs assessment, implementation plans, and initial NOAA strategies for deployment.

Additionally, NOAA implementation team members co-facilitated four thematic charrettes covering the following topics: 1) training and outreach needs (i.e., environmental education, climate change, and oil spill preparedness), 2) multiple use of the St. Louis River (i.e., recreation, tourism, commercial, energy), 3) river forecasting and data gaps, and 4) restoration activities to support delisting of the AOC. The feedback from these four charrettes was utilized to identify near-term solutions and strategies to meet regional needs through active partnerships in the St. Louis River. NOAA also used the charrettes as a means to identify specific individuals to serve as subject matter experts under the implementation plan,

once approved. Appendix 3 documents the individuals involved in the charrettes who have agreed to serve as “on-call” subject matter experts in the four thematic areas discussed above.

Phase III: Implementation, Partner Involvement, and Progress Reporting

Upon approval of this plan, NOAA intends to continue its engagement with St. Louis River partners by providing annual updates via NOAA’s cross-line office participation in the Lake Superior National Estuarine Research Reserve’s Annual St. Louis Summit. This will include involving key stakeholders and possibly the charrette’s “on-call” subject matter experts (see Appendix 3) in project planning exercises, where appropriate. Additionally, NOAA intends to make full use of the [St. Louis River Habitat Focus Area website](#) and project-related press releases, as may be appropriate for dissemination of information as progress is made.

Key Activities

NOAA will be focusing on activities to address the recommendations outlined in the St. Louis River Stakeholder Engagement Report. Four central themes were emphasized as needs in that report, including 1) Remediation and Restoration of the Area of Concern, 2) River Forecasting and Data Gaps, 3) Multiple Use of the St. Louis River, and 4) Training and Outreach. A description of the activities planned for each of these themes is provided here.

Remediation and Restoration of the Area of Concern

St. Louis River Habitat Restoration to Support the Delisting of the Area of Concern

The St. Louis River Area of Concern (AOC) Remedial Action Plan Update presents a comprehensive plan for delisting the AOC by 2025. The state AOC implementation agencies (i.e., Minnesota Pollution Control Agency and Wisconsin Department of Natural Resources) have identified a goal for completion of priority management actions by 2020. Completion of management actions in 2020, plus 5 years of monitoring will result in meeting the delisting goal of 2025.

NOAA staff members serve as subject matter and resource experts on AOC Remedial Action Plan site teams. NOAA personnel bring a broad range of experience in remediation and restoration throughout the Great Lakes. NOAA’s ability to serve on AOC teams helps partners assess and evaluate restoration designs and execution plans. NOAA is a recipient of Great Lakes Restoration Initiative funding for the purposes of leading work where NOAA has a unique role, statutory authority, or specialized experience to leverage. Additional opportunities to serve as either project leads or provide technical support to AOC teams may arise throughout the life of this implementation plan. Site-specific work that NOAA is leading or plans to fund is outlined below.

1. Chambers Grove Spawning Habitat Enhancement and Shoreline Restoration Project

Objective: Enhance spawning habitat in Chambers Grove, a section of the St. Louis River. This project will directly address St. Louis River Habitat Focus Area objective 1.

Background: Chambers Grove is a reach of the St. Louis River near the Fond du Lac neighborhood north of the highway 23 bridge. The section of the river between the Fond du Lac Dam and highway 23 is designated as critical spawning area for Lake

Superior migratory fish species including lake sturgeon, walleye, and longnose sucker. A city park was built adjacent to the river in the 1960s, and work was done to stabilize the river bank. This area provided no suitable habitat for lake sturgeon spawning, and the revetment along the shoreline eliminated shallow, low-velocity rearing habitat. A public walkway and fishing pier were built on the revetment; however, they were damaged by recent floods. As a result, the City of Duluth pursued measures to repair the park infrastructure. Recognizing this as an opportunity to restore shoreline and improve spawning habitat for critical fish species, the St. Louis River Area of Concern partners worked with the city to integrate habitat restoration with their planned park improvements.

Proposed Work: NOAA staff members were engaged in the design phase of the project, although this work is funded by other project partners. During implementation of the project, NOAA Technical Monitor staff members were made available for technical support and general project oversight. The project design phase occurred between August 2015 and May 2016. Partners on this project include the NOAA Restoration Center, Minnesota Department of Natural Resources, Minnesota Land Trust, Army Corps of Engineers, and Minnesota Pollution Control Agency. The NOAA lead for this project work is Terry Heatlie.

Designs were drafted to create 3 acres of enhanced spawning habitat by replacing 800 feet of sheet pile and gabion baskets with toe wood structures, build rock structures similar to those found below the Fond du Lac Dam, and grade and plant a naturalized shoreline. Plans included areas for canoe and kayak access. The City, in turn, agreed to follow-up with repairs landward of the shoreline to the facilities, access and landscape the grounds. In-water construction was completed in fall 2015 with completion of the shoreline and park improvements to be completed in 2016.

Outcomes: The goal of this completed project-based action is the creation of 3 acres of enhanced spawning habitat in the St. Louis River at Chambers Grove. Additionally, this project work will complete one priority management action under the St. Louis River Area of Concern 2013 Remedial Action Plan Update.

2. Radio Tower Bay

Objective: Removal of wood debris and restoration of optimum bathymetry of Radio Tower Bay. This project directly addresses St. Louis River Habitat Focus Area objective 1.

Background: A significant amount of wood debris accumulated in Radio Tower Bay, located upstream in the St. Louis River, as a result of historic saw milling operations that occurred from the late 1880s to the early 1900s. This debris serves as a hazard to navigation and has resulted in the Radio Tower Bay project being added as a priority management action in the St. Louis River Area of Concern 2013 Remedial Action Plan Update.

Proposed Work: NOAA's Restoration Center, in partnership with NOAA's Office of Response and Restoration, previously funded Phase I of this project, which resulted in the removal of wooden pilings from the bay and completing all scoping, design,

environmental review, permitting, and contracting for phase II of the project. The goal of the recently completed phase II work was to remove approximately 115,000 cubic yards of wood debris and organic material, which restored the natural biological function of the bay and established a more vital recreational connection to the project site's natural resources. Specific objectives included the dredging of material from the bay and the transport of it as slurry to a facility located approximately 1.5 miles downstream on property owned by United States Steel (USS), where it was placed in a geo-fabric-lined cell for dewatering. It is anticipated that the dewatered organic material from Radio Tower Bay will be beneficially reused on United States Steel property or on other projects within the City of Duluth. The NOAA leads for this project work are Terry Heatlie and Sarah Lowe.

Outcomes: Implementation of this project resulted in the removal of 115,000 cubic yard of wood debris and organic material. Additionally this project work completed one priority management action under the St. Louis River Area of Concern 2013 Remedial Action Plan Update.

3. *Wisconsin Point Dune Restoration*

Objective: Restore dune and shoreline habitat at Wisconsin Point (St. Louis River AOC) via a combination of shoreline restoration, dune revegetation, invasive species removals, and low-impact design installations (i.e., boardwalks, pervious surface parking lot modifications) aimed at controlling stormwater and reducing runoff and coastal erosion. This project will directly address St. Louis River Habitat Focus Area objectives 1 and 3.

Background: This project is specifically listed, as a priority project, in the St. Louis River Area of Concern 2013 Remedial Action Plan Update as an "Action Still Needed to Achieve Removal" of beneficial use impairment (BUI) 9: Loss of Fish and Wildlife Habitat. Completion of this project will make progress toward BUI 9 targets of rehabilitation of hydrologically connected habitats and treatment of invasive species.

Proposed Work: NOAA, in partnership with the Wisconsin Coastal Management Program and the City of Superior, Wisconsin, is provisionally funded to eliminate 16 of 20 parking turnouts and beach access points along Wisconsin Point, which have led to dune deterioration. The remaining four turnouts will be enlarged using low-impact development techniques, and improved to include elevated boardwalks for beach access over the dunes. The project team will also restore and revegetate the eliminated access points, which have been damaged by foot traffic. Additionally, shoreline erosion along Allouez Bay, resulting from steep slopes from past road construction, will be addressed by stabilizing the shoreline in vegetation and structure. The NOAA leads for this project work are Heather Stirratt and Brent Schleck.

Outcomes: Implementation of this project-based action will result in 2.19 acres of forest restoration and 1.33 acres of dune restoration (total of 3.52 acres restored) and 0.9 miles of shoreline stabilization and vegetative restoration along Allouez Bay. Additionally this project work will complete one priority management action under the St. Louis River Area of Concern 2013 Remedial Action Plan Update.

4. Monitoring and Restoration of Lake Superior Coastal Wetland Manoomin (Wild Rice)

Objective: Initiate a pilot for monitoring and restoring native wild rice in coastal wetlands across Lake Superior, including potential areas in the St. Louis River. This project will directly address St. Louis River Habitat Focus Area objectives 2 and 3.

Background: There is considerable focus on restoring, enhancing, and protecting coastal wetlands throughout the Great Lakes. The GLRI Action Plan for FY 2015-2019 has set a goal of over 60,000 acres restored, protected, or enhanced by GLRI-funded project work. Additionally, the Wild Rice Restoration Implementation Plan for the St. Louis River was completed in 2014 and identified a goal of 275 acres of restored wild rice in the estuary.

Analysis of land use and cover change from 1975 through 2010 suggests that Lake Superior and its tributaries (including the St. Louis River) host some of the most pristine wetlands in the Great Lakes. That said, there are many stressors on native wetland species and wild rice. These stressors include mining, climate, water quality, fluctuating water levels, and land cover change.

Proposed Work: NOAA's Office for Coastal Management in partnership with up to six Lake Superior Band of Chippewa tribes and the Bureau of Indian Affairs (BIA) will utilize high-resolution remote sensing platform data and derived data sets like the Coastal Change Analysis Program (C-CAP) to monitor coastal wetlands containing wild rice beds. This monitoring effort would look at the health of the wild rice, temporal changes in coastal wetlands, and potential invasive species, and provide information that is useful to understanding stressors on wild rice areas.

A number of valuable products will be derived from this work. Compiled and synthesized data may be used in interactive mapping of wild rice in Lake Superior for tribal leaders to use in management and decision-making processes. That same data may also be used to develop harvesting recommendations. Existing tools like OpenNSPECT may be utilized to look at potential scenarios impacting the quantity and quality of wild rice and coastal wetlands to again provide meaningful data and results that could aid in decision-support systems. All products derived from this project work will be at the request of the participating Band of Chippewa tribes and BIA.

NOAA and the partners will explore socioeconomic valuation of wild rice as a staple in tribal diets and as a component part of tribal commerce. Ecosystem services valuation of wild rice stands may be conducted since these stands offer a different form of "green infrastructure" for shoreline stabilization purposes and for providing critical habitat for wetland fish and wildlife.

NOAA is aware that many partners are working on wild rice restoration in the St. Louis River. Such partners include, but aren't limited to, Wisconsin DNR, Minnesota DNR, Minnesota Land Trust, GLIFWC, Fond du Lac, 1854 Treaty Authority, Lake Superior Research Institute, Douglas County, and Ducks Unlimited. NOAA will involve these

partners in project planning discussions to ensure that this project builds upon current efforts in the St. Louis River AOC.

Finally, restoration capacity funds will be made available from federal partners to the participating Band of Chippewa tribes for wetland restoration purposes at up to six sites throughout the Lake Superior basin, one or more of which may fall within the footprint of the St. Louis River AOC. The NOAA leads for this project work are Heather Stirratt and Brandon Krumwiede.

Outcomes: Implementation of this project-based action will result in over 800 acres of coastal wetland restored. Additionally, it will reintroduce populations of native wild rice species to restored habitats and evaluate their survival, help to protect and restore species that are culturally significant to tribes in the Great Lakes region, including Fond du Lac, manage invasive species that inhibit the sustainability of native species, and evaluate wild rice population dynamics as well as prioritize locations for future restoration efforts in other geographies.

River Forecasting and Data Gaps

5. St. Louis River Data Center

Objective: Transition a Limno Tech and Associates-designed Access database for the St. Louis River to NOAA DIVER and provide long-term operation and maintenance of that data system for AOC partners. This project will directly address St. Louis River Habitat Focus Area objectives 1 and 2.

Background: Before and during the development of the Remedial Action Plan Update, the St. Louis River AOC sediment contaminant database underwent improvements to organize past, present, and future data to serve the short- and long-term needs of the St. Louis River AOC. This effort included importing the extensive sediment contaminant data sets for the AOC from sampling efforts in 2010 and 2011 by the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. The data system project was initiated when partners and stakeholders asked for a user-friendly and accessible tool that contained the data that had been collected over the years. This led to the conceptualization of the St. Louis River AOC Data System that would serve as a tool to help assess the various data on a site-by-site basis, inform resource management decisions, and evaluate and track implementation progress to inform beneficial use impairment removal strategies. NOAA was asked by the AOC partners to transition the existing database over to a long-term permanent host.

Proposed Work: NOAA's Office of Response and Restoration (ORR) is working with St. Louis River partners to develop a data system from the NOAA Great Lakes DIVER data warehouse, query, and visualization tools to meet management needs and requirements of the St. Louis River AOC managers. This project will initiate in May 2015 and has no particular end date. Partners on this project work include the NOAA Office of Response and Restoration, Minnesota Pollution Control Agency, Minnesota Department of Natural Resources, and Wisconsin Department of Natural Resources. The NOAA leads for this project work are Annie Johns and Ben Shorr.

Outcomes: Implementation of this project-based action will be a data management system suitable for natural resource decision-making in the St. Louis River Area of Concern.

6. Reduce Impact of Flooding through Improved River Forecasting and Hydrologic Modeling in the St. Louis River

Objective: Improve resilience of the St. Louis River Estuary by extending National Weather Service (NWS) river forecasts from Scanlon down to Lake Superior. This project will directly address St. Louis River Habitat Focus Area objective 2.

Background: The St. Louis River and estuary suffered a devastating record-setting flood on June 20, 2012. Residents were evacuated, scores of houses flooded, and bridges and roads were washed out (*Washington Post*, June 21, 2012). The flooding occurred not only on the St. Louis River, but also on some of the tributaries, such as Miller Creek. An advanced warning of the magnitude and timing of the flooding would have allowed for more lead time in the evacuations and the protection of property. However, because of the lack of streamflow observations, it is currently impossible for NWS to issue forecasts downstream of Scanlon, Minnesota, about 30 miles upstream from Lake Superior.

Proposed Work: We are proposing to fund the purchase and installation of gauging stations (stream and rain gauges) along the St. Louis River downstream of Scanlon, and at a chosen number of tributaries. Furthermore, because of backwater effects (e.g., the effect which a dam or other obstruction has in raising the surface of the water upstream from it), it is necessary to develop a hydraulic model in order to estimate water-surface elevations in the estuary portion of the river. This requires the surveying of the river to obtain accurate bathymetry which can be used for a hydraulic model development and operation. Once installed, the gauging stations will be transferred to either the U.S. Geological Survey or a suitable state agency for continuing operation. NWS will develop the hydrologic and hydraulic models needed to issue the streamflow forecast

Outcomes: Extending streamflow forecasts on the St. Louis River downstream from Scanlon to Lake Superior will enable the NWS to issue prompt forecasts and warnings about impending flooding, thus allowing citizens to protect life and property, reducing the impact of flooding. Greater understanding of streamflow throughout the St. Louis River will inform on-the-ground restoration actions that are planned for AOC delisting purposes. Furthermore, having a hydraulic model will also enable the development of dynamic inundation mapping, providing a much more powerful depiction of flooding risk at each household, rather than the more abstract “water surface elevation” at a gauging site.

Multiple Use of the St. Louis River

7. Promotion of Public Access and Cultural Tourism on the St. Louis River Estuary

Objective: Enhance recreational awareness and utility of public access points along the St. Louis River. The actions outlined here, if funded, will directly address St. Louis River Habitat Focus Area objective 3.

Background: According to local chambers of commerce, the St. Louis River and surrounding cities of Duluth, Minnesota, and Superior, Wisconsin, are visited by over 3.5 million people annually. Tourism is one of the largest industries, especially in Duluth, Minnesota, creating well over \$780 million in annual direct economic impact. The past two decades represent an era of phenomenal growth and success in local tourism.

NOAA discovered, as part of the stakeholder engagement process, that recreational boaters need assistance learning about things to do along the river and while out on the water.

Proposed Work: NOAA proposes to work with local partners (e.g., St. Louis River Alliance, Lake Superior Reserve, Wisconsin and Minnesota Coastal Management Programs, chambers of commerce, commercial outfitters, parks and recreation departments, and other tourism-based information providers) as appropriate to update a public access guide for the river. NOAA would like to develop a robust public access guide that builds upon other successful access guides in the Great Lakes region and beyond (i.e., [Natural History of the St. Louis River On-the-Water Guide for Canoeists, Kayakers, and Boaters](#), [Ohio's Lake Erie Public Access - Rivers Guidebook](#), [Maine Coastal Program Public Access Guide](#)). The public access guide would be distributed to recreational users and visitors of the St. Louis River through various means. Ideally, the public access guide will feature maps of the St. Louis River from Fond du Lac Dam (lakeward) to Lake Superior and the access points along both sides of the St. Louis River (i.e., both Minnesota and Wisconsin access points). The guide would also contain historical and cultural information of the "Head of the Lakes" area, as well as over 60 possible amenities of interest to local users of the St. Louis River. NOAA is interested in capturing multiple uses in an effort to support ongoing ecosystem services assessments that will be carried out over the next several years by local partners in this geography; as these current and potential uses are better understood, the value of the estuary for passive enjoyment can be more accurately estimated.

NOAA will explore St. Louis River partner interest in the creation of web-based/mobile mapping tools and apps for display of public access points or other approaches to enhancing public access or cultural tourism along the St. Louis River. If interest exists, then NOAA will work with partners to look for funding to support such project work.

The NOAA leads for this project work are Heather Stirratt and Elizabeth Mountz, with technical support from Brandon Krumwiede.

Outcomes: Implementation of this project will directly enhance coastal tourism, access, and recreational opportunities along the St. Louis River. These social, cultural and economic benefits create pathways for greater exposure and stewardship of the unique and critical habitats found in the St. Louis River.

Training and Outreach in the St. Louis River

8. Establish and build innovative capacity for a partner-led St. Louis River Connected Educators Forum

Objective: Foster transfer and sharing of St. Louis River education and outreach projects, training, and funding opportunities. The actions outlined here, if funded, will indirectly support Habitat Focus Area objective 4.

Background: Historically a half-day forum (Water Educators Round Table), held once a month, existed to promote better coordination and professional sharing of education and outreach efforts along the St. Louis River. Key components of the information exchanged at these forums included, but was not limited to, planned or funded project work, training and professional development, and partnership and funding opportunities. There is no longer a forum available to meet the needs of St. Louis River educators and outreach professionals.

Proposed Work: NOAA proposes to host a quarterly St. Louis River Connected Educators Forum in FY 2016-2017. NOAA's ability to host these forums would depend entirely upon dedicated staff time (part-time over 2 years) to plan, coordinate, and execute the forums over this time frame.

The St. Louis River Connected Educators Forum would make regular use of remote participation technologies (i.e., WebEx, GoToMeeting, or [Connected Educator Cafes](#)) as well as leverage in-person meeting opportunities when held in conjunction with a larger meeting venue (i.e., Lake Superior Research Reserve Science Summit). This forum would focus on coordination of planned or funded project work (e.g., clean marinas programs) as well as enhance awareness of training and professional development, and partnership and funding opportunities. Additionally, the forum would provide a venue for grant proposal coordination and technical assistance, where appropriate.

The NOAA leads for exploring funding and staff time for this project work are Heather Stirratt, Liz Mountz, Cathy Green, and Ellen Brody.

Outcomes: Implementation of this project will indirectly support all five St. Louis River Habitat Focus Area objectives by building St. Louis River Educators' capacity to coordinate educational programs affiliated with the Habitat Focus Area objectives and provide professional development opportunities aimed at increasing educators' understanding and ability to teach others about the objectives outlined in this plan.

Additionally, NOAA is working to build resilience at community scales by reducing the risk of flooding through improved planning and water management strategies. The NOAA Office For Coastal Management is actively participating in providing technical assistance to the City of Duluth for the [National Disaster Resilience Competition](#) and through direct [project awards](#) focused on assessing the economic costs of flood impacts, the types of green infrastructure opportunities to help reduce these impacts, and the costs and benefits of using green infrastructure in the Chester Creek community. This ongoing work also contributes to the objective of engaging in social science research to understand ecosystem services and their associated values.

Plan for Baseline Monitoring and Measuring Progress

NOAA will use FY 2013 as a baseline for measuring progress under this implementation plan. That decision is based entirely upon the September 24, 2013, St. Louis River Habitat Focus Area selection date. While the St. Louis River Implementation Plan was in development from 2013 through 2015, NOAA was actively working to fund and become a partner on projects in the St. Louis River with the acknowledgment of this NOAA-approved Habitat Focus Area.

NOAA proposes to use the following metrics as a means of evaluating outcomes (i.e., St. Louis River Habitat Focus Area objectives) and their respective impacts on social, economic, and environmental conditions. Program evaluations will be performed according to the reporting schedule mandated by NOAA for all Habitat Focus Areas. Specific emphasis will be added to such reports to answer the following questions specific to the St. Louis River Habitat Focus Area:

1. Did the activities implemented result in significant contributions to the delisting of the St. Louis River AOC?
2. Did the activities implemented improve on-the-ground conditions in the St. Louis River Habitat Focus Area?
3. Did the activities implemented result in decreased vulnerability or increased economic vitality of St. Louis River communities?
4. Did the activities implemented result in a change of behavior with regard to increasing resilience?

As a correlation to the qualitative questions above, each project/activity will have metrics of success that will tie back to the NOAA Habitat Blueprint and other mandates (i.e., NOAA's Government Performance and Results Act measures, GLRI metrics) as appropriate. These metrics, broken down by St. Louis River Habitat Focus Area objective, will include the following:

Objective 1: Addressing loss of fish and wildlife habitat through the funding of targeted restoration projects, as well as data, products, and services delivery throughout the estuary, particularly to support delisting of the AOC:

- Number of AOC projects, where all management actions necessary for delisting have been implemented [with NOAA as the lead or primary partner]
- Number of miles of Great Lakes shoreline and riparian corridors protected, restored, and enhanced

Objective 2: Enhancing resilience by reducing the risk of flooding through improved planning and water management strategies:

- Number of communities in the coastal zone that completed projects to a) reduce future damage from hazards and b) increase public awareness of hazards with assistance from coastal zone management funding or staff members
- Number of training events related to coastal hazards or resilience offered by the coastal programs or Lake Superior Reserve, and number of participants related to coastal hazards

Objective 3: Increasing coastal tourism, access, and recreational opportunities:

- Number of projects funded or completed that are aimed at making improvements to state and territory coastal management programs (i.e., wetlands, coastal hazards, public access, marine debris, cumulative and secondary impacts, special area management plans, ocean and Great Lakes resources, energy and government facility siting, and aquaculture)
- Number of public access sites a) created through acquisition or easement and b) enhanced with assistance from coastal zone management funding or staff members
- Number of training events related to public access or ecotourism offered by the coastal management programs or Lake Superior Reserve, and number of participants

Objective 4: Provide opportunities for training, education and outreach:

- Number of training events offered by the coastal management or Lake Superior Reserve, and number of participants

Appendix 1: St. Louis River Partners

Government/Tribal	Nonprofit	Private	Research
<ul style="list-style-type: none"> ● 1854 Treaty Authority ● Carlton County Soil and Water District ● City of Duluth ● City of Superior ● Coast Guard Marine Safety Unit ● Environmental Protection Agency, Great Lakes National Program Office ● Environmental Protection Agency, Mid-Continent Ecology Division ● Fond du Lac Band of Superior Ojibwe ● Great Lakes Commission ● Great Lakes Indian Fish and Wildlife Commission ● Lake Superior Landscape Partnership ● Lake Superior National Estuarine Research Reserve ● Lake Superior Water Trail ● Minnesota Department of Natural Resources ● Minnesota Pollution Control Agency ● Minnesota's Lake Superior Coastal Program 	<ul style="list-style-type: none"> ● Alliance for the Great Lakes ● Audubon Minnesota ● Duluth Local Initiatives Support Corporation ● Friends of the Lakewalk ● Great Lakes Aquarium ● Hawk Ridge Bird Observatory ● Izaak Walton League ● Minnesota Land Trust ● Minnesota Ornithologists' Union ● Muskies Inc Lake Superior Chapter ● River Corridor Coalition ● St. Louis River Alliance ● Sustainable Twin Ports ● The Nature Conservancy-- Minnesota Chapter ● The Nature Conservancy-- Wisconsin Chapter ● Trout Unlimited Wisconsin, Wild Rivers Chapter ● West Wisconsin Land Trust 	<ul style="list-style-type: none"> ● Arrowhead Regional Development Commission ● Barker's Island Marina ● Bent Paddle Brewery ● Blue Water Paddling ● Canal Park Brewery ● CN Rail ● Cragin Machine Shop ● Daytripper of Duluth ● Duluth Chamber of Commerce ● Duluth Experience ● Duluth Seaway Port Authority ● Duluth Steam (Ever-Green Energy) ● Duluth-Superior Metropolitan Interstate Council (MIC) ● Enbridge Energy, LLC ● Lake Superior Brewing Company ● LimnoTech ● Stephen Dahl ● Superior-Douglas County Chamber of Commerce ● Vikre Distillery 	<ul style="list-style-type: none"> ● Lake Superior Research Institute ● Large Lakes Observatory ● Minnesota Sea Grant ● Natural Resources Research Institute ● Wisconsin Sea Grant

Government/Tribal	Nonprofit	Private	Research
<ul style="list-style-type: none"> ● National Weather Service ● Regional Stormwater Protection Team ● St. Louis County Land and Mineral Department ● St. Louis County Soil and Water Conservation District ● U.S. Army Corp of Engineers– Detroit District ● U.S. Fish and Wildlife Service ● U.S. Geological Survey ● USDA, U.S. Natural Resources Conservation Service– Minnesota ● Western Lake Superior Sanitary District ● Wisconsin Coastal Management Program ● Wisconsin Department of Natural Resources 			

Appendix 2: Contractor Summary of Recommended Actions for NOAA in the St. Louis River Habitat Focus Area

Category	Comment	Recommended Action
Restoration work	Delisting the AOC is extremely important and should be a priority.	Recommend that NOAA work with area of concern (AOC) coordinators to identify projects in the Remedial Action Plan that need NOAA funding for completion.
	AOC work is too limited in scope and may be detrimental to long-term planning for the estuary.	Recommend that NOAA work with stakeholders to identify other habitat restoration projects that are unfunded and fall outside of the Remedial Action Plan, most likely within the Lower St. Louis River habitat plan.
	Not all voices are being heard in AOC planning, and many people would like to see the return of the habitat committee.	Recommend that NOAA work with the St. Louis River Alliance and other stakeholders to bring back the habitat committee. Consider hosting meetings at the Lake Superior National Estuarine Research Reserve building.
Science	Data should be more easily available in a central place.	NOAA is already developing a database for the St. Louis River Estuary using its DIVER database. Recommend that NOAA expand and refine the DIVER database for the needs of stakeholders in the St. Louis River Estuary.
	Data gaps exist in the estuary.	Recommend that NOAA address the lack of information on tributaries to the St. Louis River by installing more river gauges through NOAA's River Forecast center. Coordinate with other agencies that monitor tributaries, including MPCA, Wisconsin Department of Natural Resources and USGS. Work with both Minnesota and Wisconsin Sea Grants to tailor call for proposals in the next 3-5 years to support research that fills gaps identified in the SLR stakeholders report.
Education and outreach	Stakeholders want more coordination between organizations that do environmental outreach and education work in the region. Some stakeholders are also interested in more training for classroom and outreach work.	Recommend that NOAA consider funding The Lake Superior National Estuarine Research Reserve to host an event for all organizations that do environmental education and outreach work so they can get to know each other and talk about what types of training they would like. Provide more training or bring in experts to provide training.
Recreation	Boaters want to know what there is to do on the river. The river needs more promotion.	Recommend that NOAA work with SLRA and other appropriate partners to get better distribution of the <i>St. Louis River Alliance's On the Water Guide</i>

Category	Comment	Recommended Action
	Recreational boaters need to know how to navigate past Spirit Lake. Boaters need help navigating the channel.	Recommend that NOAA fund or conduct a bathymetric survey of the St. Louis River Estuary and make this data available for the public to use for navigational purposes.
Economic connections	Ecosystem service valuation is needed to communicate value of restoration to the region.	Recommend that NOAA work with our regional and national staff to evaluate the economic impacts of proposed and ongoing restoration work.
Other challenges	No one is properly planning for the effects of climate change in the Twin Ports.	Recommend that NOAA, and its regional partners, provide workshops and training for those interested in incorporating climate change adaptation into restoration and infrastructure.
	Increased oil traffic in the Twin Ports is a concern. Organizations either do not want to see any increase in oil trafficking, or want to see better plans for response to an oil spill.	Recommend that NOAA work with partners in the St. Louis River Estuary to make oil spill preparedness plans more easily available to the public.

Appendix 3: Charrette Attendees and “On-Call” Subject Matter Experts

Category	Name	Affiliation
Education, Outreach, Training Needs	Doug Jensen, Valerie Were, Hilarie Sorenson	Minnesota Sea Grant
	Amber Westerbur	Minnesota Lake Superior Coastal Program
	Jason Hayes	Wisconsin Department of Natural Resources
	Farrah Wirtz	University of Wisconsin–Superior
	Andrea Crouse, Josh Dumke,	University of Minnesota, Natural Resources Research Institute
	Wendy Grethen	City of Superior
	Deanna Erickson	Lake Superior Research Reserve
	Gina Temple-Rhodes, Jill DiDomenico	St. Louis River Alliance
	Kristine Hiller, Carly Hawkinson	Minnesota Department of Natural Resources – Jay Cooke State Park
	Courtney Kowalczak	Fond du Lac Tribal Community College
	Larry Didomenico	U.S. Coast Guard, Marine Safety Unit
	Hannah Smith	University of Minnesota–Duluth
Deepa de Alwis	Minnesota Pollution Control Agency	
Multiple Use of the St. Louis River	Ted Angradi, David Bolgrien	U.S. Environmental Protection Agency
	Deb DeLuca	Duluth Seaway Port Authority
	Judy Gibbs	City of Duluth
	Cindy Hakala	Minnesota Department of Health
	Mike Friis	Wisconsin Coastal Management Program
	Jeff Edstrom	Cardno
	Molly MacGregor	Minnesota Department of Natural Resources
	Jesse Schomberg	Minnesota Sea Grant
	Bill Majewski	St. Louis River Alliance
River Forecasting and Data Gaps	Jeremy Erickson, Euan Reavie, Meijun Cai, Carol Reschke, Valerie Brady	University of Minnesota, Natural Resources Research Institute
	Kate Barrett, Jeremy Bates	Wisconsin Department of Natural Resources

Category	Name	Affiliation
	Joel Hoffman	U.S. Environmental Protection Agency
	Kasandra Omalia	University of Minnesota–Duluth, Large Lakes Observatory
	Nancy Schuldt	Fond du Lac
Remediation and Restoration to Support Delisting	Christine Penny	City of Duluth
	Kristin Larsen	Friends of Cloquet Valley State Forest
	Daryl Peterson, Pat Collins	Minnesota Land Trust
	Jane Anklam	West Wisconsin Land Trust
	Tom Hollenhorst, Anett Trebitz	U.S. Environmental Protection Agency
	Nelson French	Minnesota Pollution Control Agency
	John Lindgren	Minnesota Department of Natural Resources
	Matt Steiger, Molly Wick	Wisconsin Department of Natural Resources
	Kari Hedin	Fond du Lac

Appendix 4: SLR HFA Objectives, Metrics and Activity Roadmap

