Goals and Objectives for the Twelve Priority Concerns

Lake Superior Headwaters Sustainability Partnership

Prepared by

Minnesota Land Trust

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TABLE OF CONTENTS

Acknowledgments i

INTRODUCTION 5

VISION STATEMENT AND GUIDING PRINCIPLES 8

PRIORITY CONCERN 1: BIRDS 9

PRIORITY CONCERN 2: BROOK TROUT STREAMS 10

PRIORITY CONCERN 3: COASTAL WETLANDS 13

PRIORITY CONCERN 4: COMMUNITY ENGAGEMENT 16

PRIORITY CONCERN 5: DREDGE MATERIAL MANAGEMENT 18

PRIORITY CONCERN 6: ENVIRONMENTAL JUSTICE 20

PRIORITY CONCERN 7: HYDROLOGIC INTEGRITY 22

PRIORITY CONCERN 8: INVASIVE SPECIES 24

PRIORITY CONCERN 9: LAKE STURGEON 26

PRIORITY CONCERN 10: TERRESTRIAL HABITAT CONNECTIVITY 27

PRIORITY CONCERN 11: WATER QUALITY 31

PRIORITY CONCERN 12: WILD RICE 33

REFERENCES

APPENDIX A – Priority Concerns Team Member List

List of Figures

Figure 1: Headwaters Partnership Region 5

Figure 2: Multi-Sector Approach of the Headwaters Partnership 6

INTRODUCTION

The Lake Superior Headwaters Sustainability Partnership (Headwaters Partnership) is an inclusive and intentional framework for how partners in the Headwaters Partnership region (Figure 1) work together to achieve a thriving estuary landscape and community.

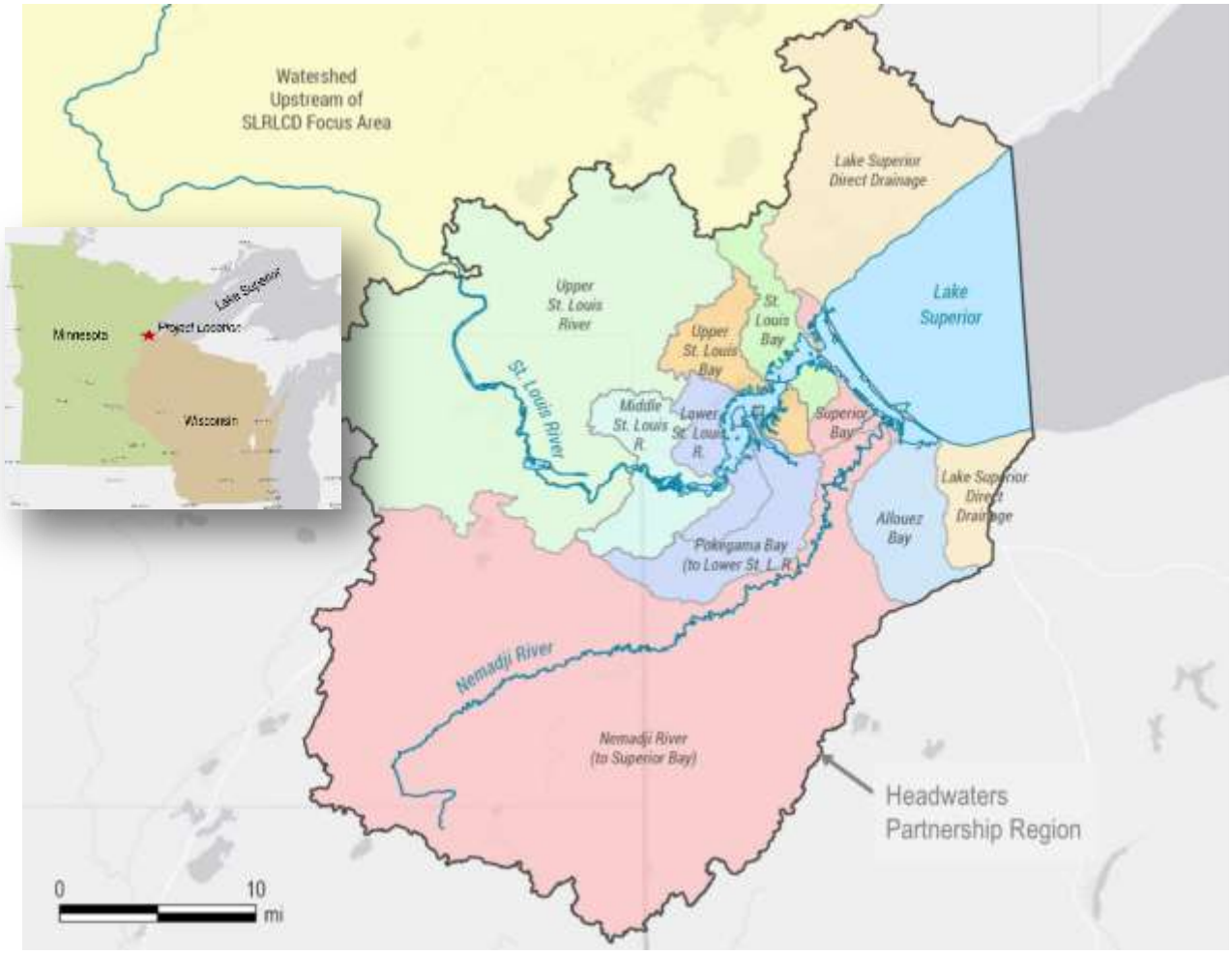

Figure 1: Headwaters Partnership Region

The Headwaters Partnership was developed using the US Fish and Wildlife Service's Landscape Conservation Design (LCD) framework, which is described as:

> *"a partner-driven approach to achieve a sustainable, resilient socio-ecological landscape. It is an iterative, collaborative, and holistic process resulting in strategic and spatial products that provide information, analytical tools, maps, and strategies to achieve landscape goals collectively held among partners (LCC Network, 2016)."*

The multi-sector approach of the Headwaters Partnership explicitly includes multiple perspectives. It encompasses the themes of natural resources management (ecological integrity), community health, and economic development, with the intersection of these themes representing a sustainable landscape (Figure 2).

In these beginning stages of the Headwaters Partnership, we approach the landscape conservation design from the perspective of natural resources management with the intentional development of our understanding of the intersections with community health and economic development over time. The Lower St. Louis River Landscape Conservation Design Scoping Report (Minnesota Land Trust, 2019) describes the initial development of this effort.

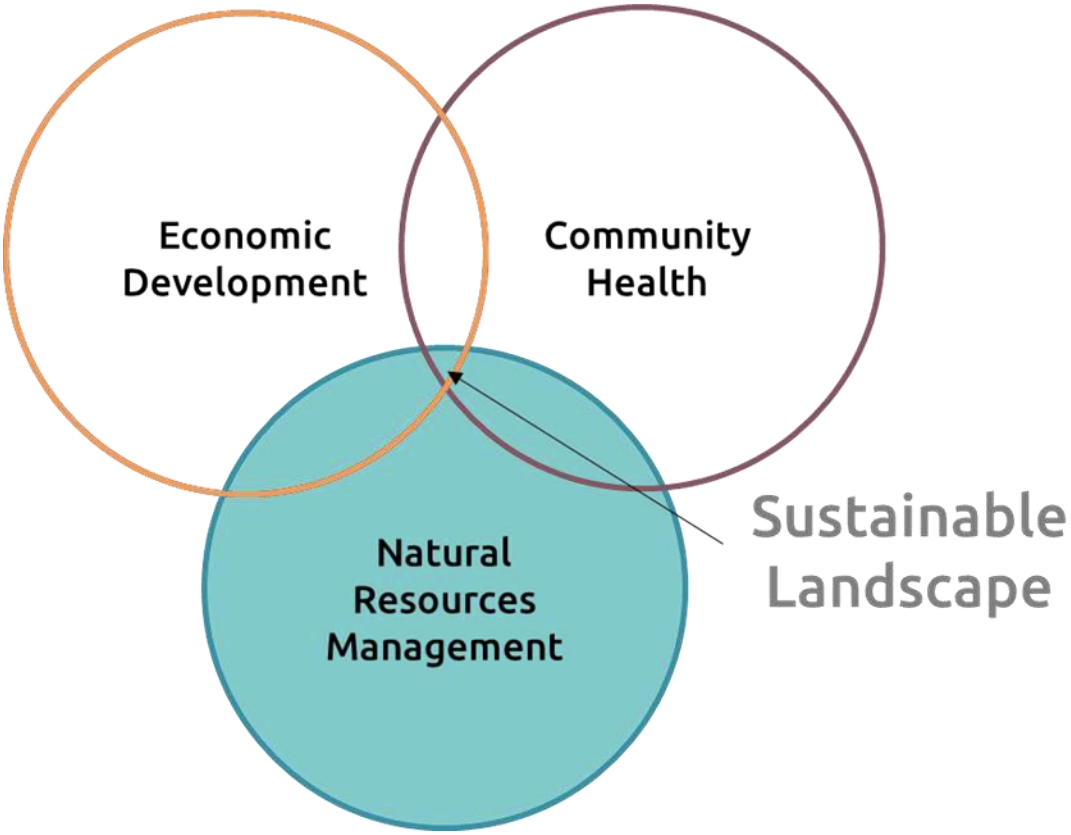

Figure 2: Multi-Sector Approach of the Headwaters Partnership

A set of twelve Priority Concerns across the Headwaters Partnership region were identified from input given by stakeholders in large group meetings held in 2019 and in a series of workshops held in 2021. While other important issues were identified and raised by stakeholders in the meetings and workshops, the Priority Concerns were recurring across multiple geographic zones. The twelve Priority Concerns are:

1. Birds
2. Brook Trout streams
3. Coastal wetlands
4. Community engagement
5. Dredge material management
6. Environmental justice
7. Hydrologic integrity
8. Invasive species
9. Lake Sturgeon
10. Terrestrial habitat integrity and connectivity
11. Water quality
12. Wild rice

In Spring 2022, volunteer teams were tasked with developing a goal statement and the set of objectives necessary to reach the goal for each priority concern. A total of 58 professionals from 25 different agencies and organizations across the region participated in setting the goals and objectives (see list of team members and leaders in Appendix A), including representatives from municipalities, counties, state, and federal agencies in Wisconsin and Minnesota, as well as Fond du Lac Band of Lake Superior Chippewa, 1854 Treaty Authority, and Great Lakes Indian Fish and Wildlife Commission.

The goals and objectives for the priority concerns represent a systems level approach to achieve the desired ecological status for the Lake Superior Headwaters region. The Headwaters Partnership's function is to assist partners in achieving these shared goals. Over time, indicators, metrics, and targets will be established to measure progress for each priority concern and the system collectively. The goals and objectives are intended to be refined and updated as new information becomes available.

The Headwaters Partnership vision and guiding principles, along with the goals and objectives for the twelve priority concerns provide a guiding framework for partner organizations to voluntarily implement projects with multi-sector benefits within the region.

The remaining sections of this document present the vision and guiding principles for the Headwaters Partnership and each priority concern and their associated goal and objectives.

VISION STATEMENT AND GUIDING PRINCIPLES

The vision and guiding principles of the Headwaters Partnership are:

> *The Lake Superior Headwaters Sustainability Partnership establishes an inclusive and intentional framework for how and where we work to achieve a thriving estuary landscape and community. The principles of sustainability, resiliency, and equity guide our approach to managing our natural resources by including economic development and community health and well-being considerations.*
>
> *In order to achieve this vision, we need to:*
>
> - *Take a holistic approach to protecting and restoring the natural resources of the St. Louis River Estuary and surrounding watersheds that can be scaled up geographically over time,*
> - *Build and improve the existing capacity and processes that enable us to work collaboratively,*
> - *Work to improve ecological integrity and resiliency while furthering a sustainable relationship between humans and the environment,*
> - *Incorporate human community needs and provide access to ecosystem services in an equitable manner,*
> - *Develop trust and legitimacy in our efforts through knowledge sharing and effective facilitation, and*
> - *Proactively identify emerging issues that may negatively impact achieving a healthy and thriving landscape.*

PRIORITY CONCERN 1: BIRDS

Goal:

Promote and maintain diverse, viable, and self-sustaining bird populations and resilient habitats in the Headwaters Partnership region. Develop guild-habitat specific objectives that align with bird populations in the focal area using guidance provided in the Upper Mississippi/Great Lakes Joint Venture Plans. Regionally focused, science-based, conservation plans will allow for implementation of local-scale restoration and conservation actions which align with larger-scale goals for birds across North America.

Objectives:

General Objectives

1. Establish guild-specific monitoring programs to document changes in species occurrence, diversity, and relative abundance over time throughout the seasons (breeding, migration, winter). Identify what additional efforts may .be needed to monitor and protect habitats used by rare, threatened and endangered species, as well as species of conservation concern.
2. Map and identify seasonally important bird habitat in the focal area by guild.
3. Develop and implement a set of meaningful metrics for evaluating the population status of target species.
4. Identify habitat restoration opportunities for target species and guilds in the focal area.
5. Identify priority areas for protection (acquisition included here) and restoration actions across the focal area.
6. Estimate the abundance and distribution of potential suitable bird habitat using guild- and species-specific habitat associations using large-scale land cover data, e.g., National Wetlands Inventory (NWI) for wetlands and National Land Cover Data (NLCD) for uplands.
7. Include climate change sensitivity and resiliency when developing recommendations for habitat restoration by guild and target species.
8. Develop a continuous assessment framework for identifying and prioritizing species or groups of species that may warrant additional management or conservation actions.
9. In conjunction with the previous objective, continuously evaluate and identify specific locations within the SLRE that may be particularly important to species or groups of species of conservation concern to target restoration, protection, or acquisition.
10. Consider the use of long-term citizen science data to document changes in bird communities that are difficult to monitor using standard survey methods (e.g., Christmas Bird Count and eBird).
11. Model future habitat availability to quantify potential changes in bird populations in the focal area over time based on different climate change scenarios (15, 50, 100 years).
12. Acquire fee title or conservation easements on X acres of priority lands for protection in 5 years and X acres in 10 years. (Note: acreage targets to be refined through future analysis.)
13. Identify X acres of priority lands which may benefit from restoration in 5 years.

Shorebird Objectives

14. Identify priority migratory bird stopover habitat and undertake, if necessary, measures to conserve and protect OR restore or create them in perpetuity.
15. Determine which landscape features and habitat characteristics within the focal area promote sustained use by shorebirds during migratory stopover periods.
16. Establish a monitoring program focused on documenting migratory use of the focal area to identify locations that support large numbers of migrating shorebirds. Survey periods should align with phenology of various groups of shorebird species.
17. Identify 'hotspots' for shorebird use and document features that are likely associated with habitat suitability (e.g., Wisconsin Bird Sanctuary and Interstate Island Wildlife Management Area).
18. Promote targeted monitoring of migratory shorebirds at key 'hotspots' in the focal area.
19. Provide recommendations for future restoration, protection, and management efforts that would likely promote use by shorebirds.
20. Promote targeted monitoring and management efforts for Piping Plover, an endangered shorebird that may nest in the focal area.
21. Annually monitor and protect habitat where Piping Plover are observed during the breeding season following US Fish and Wildlife Service protocols.
22. Identify other target shorebird species in decline that rely on this migratory corridor to document migratory use or changes over time.

Waterbird Objectives

23. Determine population status of breeding waterbirds in the focal area.
    a. Conduct annual population surveys of Herring Gull, Ring-billed Gull, Great Blue Heron, Double-crested Cormorant, and American White Pelican to document changes in distribution, relative abundance, and habitat use during the breeding season.
24. Determine feasibility of establishing artificial nesting platforms to promote use by target species (e.g., Black Tern, Great Blue Heron, Osprey).
    a. Install and routinely monitor up to ten artificial nesting platforms at selected marsh habitats within the focal area (e.g., Allouez Bay, Mud Lake) to encourage colonization of breeding waterbird species that historically nested in the area. If occupied, document nesting success using remote cameras.
25. Promote targeted monitoring and management efforts for Common Tern, an endangered waterbird that nests at one location (Interstate Island) in the focal area.
    a. For Common Terns, continue annual monitoring and management activities that will allow for assessment of population stability, including banding of all chicks and monitoring of nesting adults to determine annual survival and population dynamics.
26. Conduct surveys within the focal area to look for heron rookery. If located, develop monitoring plan. If no rookery is located, identify places within the focal area that could potentially support the establishment of a heron rookery.
27. Place nesting platforms to promote use by Black Tern and Osprey in the focal area.

Breeding Marsh Birds Objectives

28. Determine population status of target breeding marsh birds in the focal area.
    a. Choose priority breeding marsh bird species and set population goals in the focal area.
29. Identify locations within the focal area that currently support or have the potential to support high densities of priority species and target these areas for protection and restoration.
30. Restore and maintain habitat for priority breeding marsh bird populations (Use Joint Venture focal species as reference) to sustain populations and increase densities.
31. Maximize recruitment through conservation and restoration of high-quality breeding habitat.

Waterfowl Objectives

32. Determine population status of breeding and migrating waterfowl in the focal area.
    a. Define focal species to target for population assessments and monitoring for both breeding and non-breeding seasons using information from JV Waterfowl Strategy. Focal species will represent unique species-habitat associations.
33. Restore and protect habitat that primary species (to be chosen) depend on during both breeding and non-breeding seasons.
    - e.g., Blue-winged Teal are associated with NWI emergent wetlands but also shallow open water and upland grassland/herbaceous cover for nesting.
    - e.g., Wood Duck – need emergent wetlands but also forested wetlands for nesting in cavities.

Landbirds Objectives

34. Maintain viable populations of breeding and migrating landbirds in the focal area.
    a. Determine population status of target breeding and migrating landbirds in the focal area.
    b. Develop land-based monitoring program to document changes in distribution, relative abundance, and habitat use during the breeding and migratory seasons.
35. Document how changes in forest composition may influence the composition of bird communities overtime to identify species or habitats that may become limited in the future.
36. Identify trees or plant communities that require targeted restoration actions (e.g., Black Ash).

PRIORITY CONCERN 2: BROOK TROUT STREAMS

Goal:

Maintain, enhance, and rehabilitate self-sustaining, Brook Trout populations within watersheds that are resilient to the negative impacts of climate change.

Objectives:

Identification and development of objectives that lead toward resilient watersheds that support self-sustaining Brook Trout populations should be based on the five components of watershed health identified in the Minnesota Department of Natural Resources Watershed Health Assessment Framework (Biology, Connectivity, Geomorphology, Hydrology and Water Quality).

1. Remove designated impairments listed by the Minnesota Pollution Control Agency and Wisconsin Department of Natural Resources (see Water Quality Objective 6).
2. Implement stormwater management actions that minimize the negative impacts of stormwater drainage system contributions of water, sediment, and contaminants to the stream channel.
3. Remove migration barriers to Brook Trout and other aquatic organisms.
4. Remove barriers to the natural transport of sediment.
5. Identify and protect critical wetlands and coldwater springs.
6. Protect and restore natural and balanced stream channels with connections to their floodplains.
7. Control terrestrial and aquatic exotic/invasive species with accompanying planting of native trees and shrubs.
8. Evaluate and revise current zoning regulations to minimize the negative impacts of future development on critical features and functions within the watershed (i.e., headwater wetlands).
9. Establish functional and operational connections with neighborhoods and communities within individual watersheds (Brook Trout will benefit from advocacy by the surrounding community and neighborhoods).
10. Develop an equity-based approach to ecosystem services so that health benefits are equally distributed among members of our community.

PRIORITY CONCERN 3: COASTAL WETLANDS

Goal:

Restore and protect resilient coastal wetland habitats, so that water quality and substrate conditions support healthy native fish and wildlife populations, healthy native plant communities, ecosystem services, recreational uses, and commercial activities in the St. Louis River and Estuary.

Objectives:

1. Update maps of wetland and aquatic plant communities estuary wide, and correlate with fish, bird, invertebrate, and wildlife populations.
2. Identify and map restoration priorities and reference sites in the project area.

Monitoring and Research Objectives

3. Monitor emergent wetlands and aquatic vegetation in restoration and key reference sites.
4. Monitor to obtain baseline data within the St. Louis River Estuary for juvenile fish, semi-aquatic mammals, reptiles and amphibians, and terrestrial invertebrates.
5. Incorporate climate adaptation in project designs to promote resilient coastal wetlands and mitigate the impacts of climate change to address extreme fluctuations in water levels.
6. Identify shoreline softening and enhancement opportunities for habitat, coastal flooding resiliency, bank stability, and public access using appropriate native vegetation.
7. Protect riparian and floodplain forests.
    a. Identify appropriate tree species to replace black ash impacted by emerald ash borer and underplant with those appropriate species.
    b. Identify high quality riparian and floodplain forests that do not contain ash species and work to maintain them.
8. There are portions of the estuary that are sediment starved due to physical barriers such as the Fond du Lac dam and reservoirs upstream; meanwhile, there are other portions of the estuary where sedimentation has increased along tributaries as a result of development. For example, sandbar communities enclosing sheltered bays are subject to erosion and loss to high water levels and impacts of sediment reduction due to dams.
    a. Conduct research on sediment movement in the St. Louis River to investigate the sources and sinks of the sediment in the St. Louis River Estuary. This will inform if/where are locations that need to be/can be replenished with sediment to preserve and restore erosive areas like islands and sandbars while also trying to minimize the impacts on the working industrial harbor. This will support Dredge Material Management Objective 15.
9. Identify the reason for the lack of plant growth in some parts of the estuary where the observed water depths are suitable for plant life (for example, 40th Ave West, 21st Ave West, and upstream of Interstate Island).

Restoration and Conservation Objectives

10. Reduce abundance and extent of non-native invasive plants, including invasive cattails, phragmites, purple loosestrife, yellow iris, and potential future invasive plants along shores of the estuary.
    a. Refine toolbox of methods to control each invasive plant species.
    b. Educate the public and decision makers about the need for control of invasive plant species and the threats they pose (e.g., benefits/costs of chemical use vs. manual or mechanical control and inability of infested plant communities to respond to changing water levels).
11. Consider shoreline erosion issues when lake levels are extremely high, such as habitat loss, property loss, and increased turbidity. Ensure there are transition zones within the wetland community that allow vegetation to respond to changing water levels. This would likely require cattail management. Address these issues with beneficial placement of dredge materials and water retention planting design, such as described in Wisconsin's "slow the flow" effort, and comprehensive watershed planning such as Minnesota's "One Watershed, One Plan" program.
12. Identify potential recreational access points to establish and maintain for watercraft and shoreline fishing. Stakeholder suggestions included Connor's Point, Allouez Bay near the Power Squadron dock, St. Louis River above Thomson Reservoir, Scanlon Reservoir, and points along the St. Louis River National Water Trail.
13. Preserve the integrity of natural features that define the SLRE, including the river islands, floating mats, emergent and submergent vegetation and maintain the important fish spawning and bird nesting habitat.
14. As identified in Lake Superior's Biodiversity Conservation Assessment, ensure that the coastal wetlands are in "good" condition: within acceptable range of variation and may require some intervention or maintenance.
    a. Identify high quality coastal wetland communities in the estuary and work to protect the highest quality wetlands.
    b. Address fragmentation of coastal wetlands – possibly through future restoration design or expanding emergent zones on the edges of the highest quality wetlands to lessen the wave energy, drop out sediments and better protect the floating mats.

Education Objectives

15. Preserve the cultural history and knowledge of the estuary and river.
16. Develop educational materials to change public perception of eroding clay bluffs and highlight what makes the clay seepage bluff communities both unique and functional.

Water Quality Objectives

17. Research and identify acceptable water quality standards for the shallow bays.
18. Maintain existing tributary and estuary water quality monitoring programs and expand water quality monitoring in the estuary as needed, specifically determine what impairments need to be addressed. Identify which water quality information still needs to be collected, such as new or emerging contaminants.
19. Address water quality issues detected via water quality monitoring programs and other research, for example, dioxins, mercury/methylation, sulfates, phosphorus, high conductivity, legacy contaminants, papermill discharges, turbidity, hypoxia/DO, PFAS, personal care products, pharmaceuticals, e-coli, and microplastics.
    - e.g., Identify main contributing sources of water quality issues, such as mercury and

enforce responsible parties. Reduce mercury in fish tissue and remove fish consumption advisories when mercury levels are deemed safe.

20. Conduct research on oily residue emulsified in water at 21st Avenue West to learn the source of this contaminant and its effects on aquatic plant, animal, and in

PRIORITY CONCERN 4: COMMUNITY ENGAGEMENT

Goal:

Community engagement is prioritized and valued as essential to support a thriving social-ecological system in the lower St. Louis River. Communities connected to the river generate, inform, co-develop, contribute to, and evaluate the actions of the Headwaters Partnership, with reciprocal responsiveness, resources, and support from the Partnership.

Objectives:

All community engagement objectives are enacted in alignment with Priority Concern 6: Environmental Justice goals and objectives. Community engagement processes may be reviewed and advised by compensated social justice experts to ensure that they are representative and just. The working group recommends that these objectives are augmented through dedicated funding and staffing via fellowships or AmeriCorps opportunities (i.e., via Ecolibrium3 or other partners). It is recognized that meaningful community engagement may substantially alter anticipated project priorities and objectives in the Lower St. Louis River, but that attention to community-derived priorities supports the long-term sustainability of the region and the vision of the Partnership.

1. In developing and establishing community engagement processes, the Headwaters Partnership invests time and effort to build trusting and equitable community relationships.
    a. Headwaters Partnership employees and partners strive to be aware of and sensitive to the power dynamics that can arise from unconscious biases such as those related to gender, race, culture, seniority, area of expertise, level of education, affiliation, and roles and responsibilities within a project.
    b. To establish a consistent and reliable presence over time, the Partnership engages community members in accessible places such as school events, elder meals, community celebrations and public outdoor spaces on a bi-annual basis at minimum.
2. Building on efforts to build community relationships (see Community Engagement objective 1), invite and establish an advisory council of representative community members (see Environmental Justice Objective 1).
    a. The working group recommends approaching city commissions (for example, the Duluth Indigenous Commission) for input and advice on council structure and participants.
    b. Advisory council members are compensated for their time and provided with resources or expertise needed to support their work.
3. With support and appropriate training, the community council designs a community engagement process that will guide restoration and conservation actions conducted by the Headwaters Partnership across focus areas.
    a. The engagement process will be implemented across Headwaters Partnership objectives, with clear steps and points of engagement and input that occur before, during and after a major action, building meaningful ongoing relationships with river connected communities.
4. Work with youth-connected programs (such as the Rivers2Lake program, Youth Outdoors Duluth, or

Neighborhood Youth Services) to establish a paid youth advisory council that guides and informs the structure, work and projects of the Partnership while building an engaged future community, with an eye towards long term sustainability of the lower St. Louis River. The youth advisory council may work jointly with the community council, as needed.

5. Build a sustained and accessible presence in the community through novel means of community engagement that utilize storytelling, visual and media arts, and outreach and educational events. These activities build broad and long-term interest and capacity for work that supports the social-ecological health of the lower St. Louis River.

    a. Partnership staff or key partners working on behalf of the Partnership produce at least two communication products or engagements annually.

6. Identify and build cross-community partnerships between organizations outside of traditional land conservation organizations in order to foster long term resilience and social-ecological well-being on a 5-10-year time scale. This process may be initiated by conducting snowball interviews with community-engaged leaders and educators (for example, the UW-Superior Link Center) to identify organizations with overlapping interests.

PRIORITY CONCERN 5: DREDGE MATERIAL MANAGEMENT

Goal:

Increase public awareness of the dredging process for maintaining the Great Lakes navigation system and identify opportunities to more effectively manage material that benefits both the environment and economic interests.

Objectives:

1. Develop a communication strategy that effectively describes the importance of dredge material management, its economic benefits, the steps taken to make management decisions, and ways in which materials are utilized to improve ecosystem services (habitat restoration, reclamation, revitalization, etc.).
2. Conduct a public survey to assess the knowledge, attitudes, and awareness of operation and maintenance dredging and dredge material management within the Port of Duluth-Superior. Use results from this survey to target future outreach efforts to improve public awareness and understanding.
3. Review the Operation and Maintenance (O&M) planning and technical services approach in order to identify opportunities for improving the process.
4. Document performance measures and/or case-study results when beneficially using dredge material in the Duluth/Superior Harbor.
5. Identify concerns and potential deleterious impacts that result from managing dredge material.
6. Identify and resolve barriers to beneficially using dredged material when considering future management opportunities (for either in-water or land-based placement).
7. Summarize existing available data on fish habitat and habitat use, spawning, and movement to determine the locations and times most critical to sustaining healthy fish stocks in the Duluth-Superior Harbor. Identify knowledge gaps that need to be addressed to inform when and where in-water work should occur to minimize damage to the fishery.
8. Ensure sediment sampling methods are adequate for characterizing material depending on proposed use (e.g., duration between sampling events, sample number/dredge prism volumes, chemical constituents, etc.).
9. Align proposed dredging operations with environmental exclusions to limit impacts on habitat and the aquatic community.
10. Evaluate project viability by estimating the transportation costs and logistics associated with a proposed placement location and source (e.g., calculate transportation costs from PRF).
11. Provide general guidance on preferred material characterization for intended beneficial use (e.g., shoreline construction, capping, biomedium placement).
12. Better define Federal authority (e.g., Water Resources Development Act 2020 language) for opportunities that would provide assistance in research and/or flexibility in managing material stockpiled on Erie Pier.

13. Communicate dredge material management recommendations from the Headwaters Partnership Team to the Dredging Sub-committee of the Harbor Technical Advisory Committee in order to help facilitate/update the Duluth/Superior Harbor Dredge Material Management Plan.
14. Communicate objectives shared with other Priority Concern Teams (ensure public survey objectives align with Community Engagement objectives).
15. Establish an on-going list of prioritized beneficial use opportunities (habitat restoration within or outside the estuary).
16. Identify a suite of environmental metrics that can be assessed estuary-wide to help identify areas for future resource management consideration that protect, enhance, or restore habitat conditions or better support target species.
17. Utilize the EPA dredge material decision support tool to help prioritize beneficial use opportunities developed by resource management experts.

PRIORITY CONCERN 6: ENVIRONMENTAL JUSTICE

Goal:

Outcomes of the Headwaters Partnership advance the multiple dimensions of environmental justice through protection and restoration of the St. Louis River estuary ecosystems, equitable and sustainable revitalization of estuary communities, and promotion of reciprocal relationships between humans and nature.

Objectives:

All Environmental Justice objectives are enacted in alignment with Priority Concern 3: Community Engagement goals and objectives.

Process Objectives: The Headwaters Partnership's culture and process advances environmental justice and equity.

1. Hire and compensate social justice experts for support implementing environmental justice objectives, especially objectives 2,3,4,5, and 6. Timeframe: short (<3 years).
2. Headwaters Partnership will convene a community advisory council of diverse representatives from the communities connected to the Lower St. Louis River. This council will be a liaison between the Partnership and the communities the Partnership works in and serves. The group will be based on the Jemez Principles for Democratic Organizing or similar principles and will compensate members for their commitment to the council (see Community Engagement objective 3). Training will be provided to council members to support skills development in leadership and effective communication on behalf of the community to the Partnership, and on behalf of the Partnership to the community. This training program may be established through local partnerships with cities (e.g., Leadership Duluth Program, etc.) or other local organizations. Timeframe: short (<3 years).
3. Headwaters Partnership will establish shared environmental justice principles and values upon which the Headwaters Partnership will operate, which will advance equity, inclusion, and social justice. Timeframe: short (<3 years).
4. Headwaters Partnership will establish a plan to increase representation of BIPOC and historically underrepresented people within the Headwaters Partnership and within all tiers of partnership organizations. Timeframe: long (5-10+ years).
5. Based on established shared principles and values (EJ Objective 3), the Headwaters Partnership will establish guidance about best practices for ensuring Headwaters Partnership principles and values are upheld in our work. This may include actions such as decentering white-dominant culture, ensuring meeting accessibility, sharing pronouns, language, jargon use, land acknowledgement, supporting women- and BIPOC-owned businesses, etc. Timeframe: Medium (3-5 years).
6. Honor Tribal Sovereignty. This includes:
    a. Prioritize work that supports treaty rights to hunt, fish, gather, and practice traditional lifeways within Ceded Territory based on engagement with Tribal Nation partners, Tribal members and descendants, and the community advisory council. Timeframe: short (<3 years).
    b. Conduct routine informal consultation with Tribal Nation partners and tribal commissions about Headwaters Partnership activities within Ceded Territory. Timeframe: short (<3

years).

c. Confirm longstanding and evolving Indigenous and local community knowledge as equal and complimentary to institutional knowledge in decision-making by establishing guidance for incorporating multiple ways of knowing into decision-making in alignment with objective 3 and implementing this guidance in project decision-making. Timeframe: Medium (3-5 years).

Understanding & Knowledge Objectives: The Headwaters Partnership becomes competent in its approach to addressing environmental justice and equity and applies that knowledge in its work.

7. Headwaters Partnership will pursue funding for and offer trainings for the local conservation community in the topic areas of justice, equity, diversity, inclusion, cultural competency, and trauma-informed community development. Timeframe: short (<3 years).
8. Identify priority neighborhoods for restoring ecosystem function and/or increasing access to healthy ecosystems to benefit disadvantaged communities. To achieve this, Headwaters Partnership will:
    a. Advance our understanding of access and barriers to access to the estuary for estuary communities through collection of objective data, subjective data, and increasing community engagement. Timeframe: short (<3 years).
    b. Advance our understanding of neighborhood and community characteristics including demographics, health, relationships with nature, and perceptions of nature, through collection of objective data, subjective data, and increasing community engagement. Timeframe: short (<3 years).
    c. Identify a menu of standard metrics that can be used to assess community impacts of projects by the Headwaters Partnership. Timeframe: short (<3 years).

Project-based Objectives: The Headwaters Partnership incorporates environmental justice and equity considerations and actions in every project.

9. As part of each project conducted, the Headwaters Partnership will conduct authentic and genuine community engagement according to the process established by the community advisory council (see Community Engagement Objective 5). This may include community identification of new project needs, and/or making changes to projects in response to community input. This may require extended project timelines. Timeframe: Medium (3-5 years).
10. As part of each project conducted, the Headwaters partnership will conduct a climate assessment, including environmental, social, and economic dimensions, to evaluate projected climate change impacts to project outcomes and potential climate adaptations. Timeframe: short (<3 years).
11. As part of each project conducted, the Headwaters partnership will consider appropriate access to the site and, where the site is physically accessible, will include efforts to create safe access to nature, including the diversity of the forms of safety. Timeframe: short (<3 years).
12. As part of each project conducted, the Headwaters partnership will evaluate equitability of impacts to communities and strive to achieve equitable outcomes. Timeframe: Medium (3-5 years).
13. As part of each project, the Headwaters Partnership will assess community and human well-being impacts (including benefits and unintentional consequences), including before and after project implementation. Timeframe: Medium (3-5 years).

PRIORITY CONCERN 7: HYDROLOGIC INTEGRITY

Goal:

For the streams, lakes, and wetlands within the estuary landscape to be resilient and function as close as possible to their range of natural variation, which includes a natural flow regime and healthy water quality.

Objectives:

1. Develop implementation focused sub-watershed management plans at HUC 10-12 scale that comprehensively identify and address ecological and physical stressors.
    a. Conduct baseline inventories to inform sub-watershed planning, which may include an inventory of water storage opportunities, wetlands, cold water inputs, biological community health, storm sewer system mapping, road-stream crossings, habitat, or stream health.
    b. Develop priorities for protection – forests, wetlands, streams, riparian areas, shoreline setbacks, and watershed storage
    c. Prioritize green infrastructure opportunities and areas to be restored/protected
2. Enhance monitoring of streams and wetlands (e.g., flows, temperature, and water quality). Also included as Water Quality Objective 3.
    a. Increase availability of monitoring data to the public
    b. Pursue funding to support ongoing monitoring to help identify stressors and track improvements.
    c. State of estuary monitoring as we move post AOC – gather baseline data, hypoxic areas
3. Implement an urban stormwater management strategy (see Brook Trout Objective 2):
    a. Create and maintain an inventory of green/grey infrastructure
    b. Emphasize green infrastructure solutions
    c. Inventory natural storage and retention opportunities (wetlands, glacial till deposits, native plant community retention)
    d. Restore, protect, and enhance watershed functionality in relation to stormwater management goals
4. Implement an infrastructure upgrade plan for climate resiliency
    a. Incorporate and update design standards for infrastructure that include climate change considerations
    b. Coordinate stormwater management planning with other jurisdictions, state, county and municipal, township.
    c. Develop and adopt a climate resilient stormwater management focused development code. Consider assistance from DUWAC.
5. Combine sub-watershed and stormwater management planning with regional transportation planning to maximize efficiency of funding resources and align schedules
6. Identify and pursue funding opportunities to develop and act on the objectives identified.

7. Maintain or restore natural hydrologic connectivity
    a. Longitudinal – natural stream flows, sediment transport, and aquatic organism passage through human-made barriers which include road-stream crossings
    b. Lateral – waterbody access to the appropriately sized floodplains and shorelines during high flow events to dissipate energy, provide groundwater recharge, and decrease stress to stream banks and bed.
    c. Vertical – surface to groundwater interactions including coldwater inputs
        i. Improve the understanding of groundwater inputs, flows, recharge rates (efforts are currently underway in MN & WI)
        ii. Preserve baseflows
    d. Temporal – protect and restore the resiliency of waterbodies against physical and ecological changes throughout time
8. Provide educational opportunities to both natural resource professionals and the public.
    a. Host and partake in a local symposium where local professional share techniques and knowledge specific to the AOC area (See https://www.lrcd.org/stream-science-symposium-i.html **).** Previous symposium held at UMD 6-7 years ago with the help of Paul Sandstrom.
    b. Facilitate communication via a contact list of practitioners focused on watershed health (or other more specific topic)
9. Engage with the community through:
    a. Citizen science opportunities and participatory science (see https://www.epa.gov/participatory-science)
    b. Information dissemination
    c. School and community group engagement
    d. Updated websites
        i. Update the Lake Superior Streams site and potentially expand to WI
    e. Public service announcements
    f. One on one contacts with landowners regarding shoreline setbacks
10. Improve water quality by implementing Water Quality Objectives 4, 6, and 7.
    a. Remove water bodies from the Clean Water Act 303(d) impaired waters list
    b. Remediate legacy pollution and new & emerging contaminants
    c. Address point and non-point source pollution and clean up litter
11. Improve our understanding of the seiche on the estuary and effects to the near shore areas on Lake Superior.
12. Support the local natural resource groups that provide technical knowledge and collaboration as well as public engagement. This includes the Regional Stormwater Protection Team (RSPT), DUWAC, & Lake Superior Collaborative
13. Explore the benefits of establishing a watershed district for this area to potentially help fill a void for cohesive planning, coordination, and public engagement

PRIORITY CONCERN 8: INVASIVE SPECIES

Goal:

Protect and maintain diverse native plant communities and resilient habitats within the Headwaters Partnership region so resilient ecosystem services are provided for plants, animals, and people with minimal impact from invasive species. Conduct invasive species prevention, education, and population management activities in a biologically sound and culturally appropriate manner.

Objectives:

1. Develop invasive species outreach & education campaigns to promote invasive species prevention behaviors.
    a. Use principles of Community Based Social Marketing (CBSM) to promote prevention behaviors.
    b. Identify and engage with key user groups (e.g., non-motorized boaters, motorized boaters, hunters, anglers, homeowners, trail users, gardeners, service providers, highway departments, constructions companies, nursery, and landscape industries)
    c. Design "hands-on" activities to engage with recreational user groups and promote invasive species prevention messaging.
    d. Provide tools for invasive species removal/disposal at key user sites (e.g., Clean/Drain/Dry/Dispose (CD3) stations at boat launches, boot brush kiosks at trailheads).
2. Conduct regular Early Detection Rapid Response (EDRR) monitoring and notify agencies of new species finds and response plan.
    a. Develop collaborative approach for targeting monitoring effort across agencies.
    b. Share monitoring data and response plans between agencies using an online collaborative sharing platform.
3. Collect baseline data on native plant communities and spatial extent of both aquatic and terrestrial invasive plant species infestations. Use baseline data to target population management strategies and quantitatively evaluate effectiveness.
    a. Conduct point-intercept vegetation surveys throughout St. Louis River estuary.
    b. Conduct native plant community surveys throughout public lands in the Headwaters Partnership region.
    c. Collect shoreline data to prioritize monitoring, protection, population management.
    d. Map distribution and extent of key invasive plant infestations.
4. Design and implement invasive species population management strategies (Integrated Pest Management or IPM) to the extent necessary to reduce disruption of priority ecosystem services by invasive species populations.
    a. Identify priority areas for population management.
    b. Pursue funding for targeted IPM efforts, ideally plan for management on a 3 to 5-year timescale or longer.

    c. Continue maintenance and monitoring of control sites after project completion and Area of Concern delisting.

    d. Identify population management sites that are prone to reinvasion (e.g., ash stands)

5. Develop a decision support tool for the Headwaters Partnership region utilizing existing invasive species database and mapping resources.

6. Engage with decision makers, stakeholders, citizens, resource managers and agency partners to communicate threats posed by invasive species and encourage participation in prevention and management activities.

7. Pursue and support research on terrestrial and aquatic invasive species to improve program efficacy.

    a. Conduct research and monitoring focused on maritime commerce and ballast water.

    b. Research and refine existing invasive species control technologies to quantify and improve effectiveness and reduce impacts to non-target species.

    c. Investigate effects of invasive species on ecosystem services provided by the Headwaters Partnership region.

8. Strengthen interstate partnerships and seek to implement consistent messaging.

    a. Conduct outreach campaigns in coordination with MN, WI, and tribal partners.

    b. Clarify differences between WI and MN AIS laws and communicate key points to stakeholders.

9. Meet with partners to develop a strategy and brief guidance document for carefully targeted herbicide use as part of an IPM approach.

    a. Conduct literature review to support decision making on herbicide use and compile pertinent data to stakeholders and partners.

    b. Develop decision making guidance document suggesting when/where to consider herbicide as a tool for AIS population management within the Headwaters Partnership region.

    c. Engage with local decision makers to make recommendations regarding herbicide as an invasive species management tool, communicate priorities, and discuss concerns.

10. Promote on-site invasive species preventative measures for contractors or staff working on other projects in the Headwaters Partnership region.

11. Identify and pursue sustained funding to support partnership activity and accomplish objectives listed above.

    a. Support implementation of aquatic and terrestrial invasive species programming in the Headwaters Partnership region by state and local governments, tribal partners, and stakeholder groups.

    b. Encourage increased cooperation among Headwaters Partnership stakeholders and support invasive species project proposals that engage multiple partners.

PRIORITY CONCERN 9: LAKE STURGEON

Goal:

Maintain, enhance, and rehabilitate self-sustaining Lake Sturgeon populations by providing a resilient watershed through the protection and rehabilitation of habitat and migration corridors important for all life stages.

Objectives:

Identification and development of objectives that lead toward resilient watersheds that support self-sustaining Lake Sturgeon populations should be compatible with other rehabilitation plans for Lake Sturgeon in Lake Superior (Auer 2003, Horns et al. 2003, MNDNR 2019, WIDNR 2020).

1. Maintain a minimum adult population of at least 1,500 mature adults.
2. Roughly equal sex ratio of non-spawning individuals.
3. Twenty or more naturally reproduced year-classes of adult fish.
4. Evidence of annual reproduction.
5. Measurable recruitment of age 0-5 fish.
6. Maintain collaboration among resource management agencies to evaluate Lake Sturgeon habitat use and identify key habitats across life stages.
7. Work with partners to evaluate opportunities to enhance sturgeon populations.
8. Remove or mitigate both upstream and downstream migration barriers to Lake Sturgeon.
9. Remove barriers to the natural transport of sediment and restore natural hydrologic processes.
10. Remove designated impairments listed by the Minnesota Pollution Control Agency and Wisconsin Department of Natural Resources (see Water Quality Objective 6)
11. Prohibition or regulation of harvest to maintain annual exploitation rates less than 5%.
12. Continued sea lamprey and other invasive species management to ensure minimal negative impact on Lake Sturgeon.
13. Public awareness and education on the ecological and cultural importance of Lake Sturgeon.
14. When Lake Sturgeon are successfully rehabilitated, develop a conservative sustainable harvest plan for both tribal and state anglers.

PRIORITY CONCERN 10: TERRESTRIAL HABITAT CONNECTIVITY

Goal:

Terrestrial habitats in the Headwaters Partnership region are resilient to the impacts of climate change and development, ecologically connected, and support thriving ecological communities that include humans and culturally significant plant and animal species.

Objectives:

1. Support the national American the Beautiful Initiative[1] by protecting and restoring an additional 20,000 acres of wetlands and 10,000 acres of forested habitats in the St. Louis River watershed to enhance connectivity and climate resiliency. Conservation opportunities within the watershed may allow for greater protection (i.e., more than 30% of the landscape protected) and could aid in achieving the 30% goal at larger geographic scales.
    a. Revise acreage targets based on an analysis of protected lands and potential opportunities to contribute to protection at larger scales.
2. Apply habitat use models to understand plant and animal movement and dispersal patterns and identify priority sites for land protection and restoration projects that contribute to climate resilience and landscape connectivity.
3. Protect and enhance existing landscape corridors including, aquatic organism passage and riparian/stream connectivity.
    a. Compile existing wildlife movement data and road mortality data and identify data gaps in our ability to identify safe road crossings and critical linkages between core habitat patches.
    b. Convene a wildlife linkages workshop with key stakeholders to identify existing connectivity opportunities and identify connectivity challenges.
    c. Develop an online dynamic mapping dashboard to display critical linkage data for project development, planning, and implementation.
4. Develop an index of fragmentation and track over time to measure change and aid in prioritization of restoration and protection actions.
5. Develop (or refine) an assessment of existing forest communities with respect to alignment with range of natural variation in forest cover, type, and age classes.
6. Support implementation of other existing plans, including but not limited to:
    - Appropriate geographic components of the St. Louis and Cloquet and the Nemadji to Fish

[1] https://www.doi.gov/sites/doi.gov/files/report-conserving-and-restoring-america-the-beautiful-2021.pdf

Creek Regional Plans of the Lake Superior Biodiversity Conservation Strategy and the broader Lake Superior Lakewide Action and Management Plan (LAMP)

- Fond du Lac Resource Management - Integrated Resource Management Plan
- Lower St. Louis River Habitat Plan
- Minnesota Department of Natural Resources state plans such as the State Wildlife Action Plan, Management Plan for Invasive Species, Moose Research and Management Plan, Biological Survey Ecological Evaluations, and Climate Change and Renewable Energy: Management Foundations
- Minnesota Pollution Control Agency - Minnesota Watershed Restoration and Protection strategies
- Bird Conservation Plan for the Boreal Hardwood Transition (Bird Conservation regional 12 – US Portion)
- City of Superior Special Area Management Plan
- Wisconsin Point Area Management Plan
- Coastal and Estuarine Land Conservation Plan
- Joint Venture Bird Plans
- Piping Plover Management Plan
- St. Louis River Remedial Action Plan
- Wisconsin DNR Lake Superior Estuary and Coastal Wetland Biotic Inventory Plan
- Wisconsin DNR Statewide Strategic Plan for Invasive Species
- Wisconsin DNR Wildlife Action Plan (WWAP)

7. Implement priority management actions identified for the Superior Coastal Plain in the Wisconsin Wildlife Action Plan and the St. Louis Estuary Conservation Focus Area of Minnesota's Wildlife Action Plan, with updates as appropriate when State plans are revised. Develop an action plan with targets and timelines for the following specific management actions:

   a. Implement the following management actions for Lake Superior beaches, shorelines, dunes, and bluff habitat: (as defined in WWAP)

      i. Understand and maintain the short-term and long-term dynamics needed to sustain Lake Superior's coastal ecosystems, especially the estuaries, beaches, and dunes.

      ii. Protect shorelines from developments that will degrade habitats, impair ecosystem function, and lower water quality.

      iii. Provide information and incentives to private owners of shoreline properties to encourage them to increase their protection and stewardship efforts.

      iv. Monitor natural communities and habitats associated with Lake Superior and its shorelines, such as beaches, dunes, coastal estuaries, "maritime" forests, and boreal forests.

      v. Monitor taxa that are of high importance in the Lake Superior region, including habitat specialists, boreal species and southern disjuncts, selected plants, aquatic invertebrates, fish, and birds.

   b. Implement the following management actions for Boreal Forest:

      i. Identify and protect remnant stands exhibiting relatively little evidence of past disturbance. Initially these might come from the public land base or on lands identified and managed by

NGOs via acquisition or conservation easement.

ii. Design and initiate a boreal forest restoration project somewhere on the Lake Superior clay plain in which the objectives will include an increase in conifer cover, an increase in effective forested area, better representation of large trees and coarse woody debris, and a reduction in forest edge.

c. Implement the following management actions for Red Clay Wetlands:

i. Implement portions of the Superior Special Area Management Plan that will protect the most intact and viable wetlands falling into the red clay group and those that support the greatest concentrations and largest populations of rare species.

ii. Conduct surveys for selected animals, including birds, invertebrates, herptiles, and mammals to better understand protection needs for species in greatest conservation need.

iii. Develop and deliver educational materials to highlight the ecological and utilitarian value of red clay wetlands which are locally common and generally perceived as a problem that needs fixing.

d. Implement the following management actions for Headwater Wetlands:

i. Inventory key upper watershed wetlands on the top of the hill (e.g.., Miller, Keene, Kingsbury) which are being lost to development and help to slow the flow of water to lower parts of the watershed and build resilience to storms and climate change induced high flow events.

ii. Review and update local zoning codes related to wetlands to ensure protection of priority wetlands and green infrastructure.

e. Implement the following management actions for River Corridors:

i. Map riparian flood zones and prioritize river corridors for protection efforts.

ii. Identify and protect additional forested sites along river corridors. Natural communities that merit especially high levels of protection include Boreal Forest, Northern Mesic Forest (rich, hardwood-dominated stands), Floodplain Forest, and various wetland types that occupy former river channels or sites receiving groundwater seepage. Stream corridors that are primarily in private ownership and have both forest restoration potential and water management/erosion issues might be considered relatively high protection and restoration priorities.

iii. Protect coastal wetlands and adjoining uplands that occur at river mouths. Examine the restoration potential of stream corridors throughout the ecological landscape.

iv. Identify problem watersheds or areas within river corridors that contribute to reduced water quality and conduct restoration activities as appropriate.

v. Experiment with methods of managing lands and vegetative cover that will reduce the rapidity of water flow into streams.

f. Implement the following management actions for Clay Seepage Bluffs:

i. Conduct detailed plant surveys and mapping to better characterize the composition, structure, and variability expressed by clay seepage bluffs and increase knowledge of factors that contribute to the support of rare species in this community type.

ii. Develop protection priorities and preliminary management guidelines for clay seepage bluff habitat.

iii. Protect clay seepage bluff sites that support unusual flora or fauna while maintaining hydrological function.

g. Implement the following management actions for Old-Growth Forests:

i. Protect stands of old-growth forest where they occur or have the best opportunities for developing boreal forest community composition and structure.

ii. Prioritize protection for upland communities that include boreal forests, mesic to wet-mesic hemlock-hardwood forests, eastern white and red pine forests, and rich mesic maple-basswood forests.

iii. Prioritize lowland communities that include stands of northern white-cedar, black spruce, tamarack, black ash, or silver maple-green ash.

iv. Implement management actions to ensure that stand size and context contribute to long-term forest viability and conservation value.

v. Explore old-growth protection opportunities within, or adjacent to, protected public lands, stream corridors, and large wetland complexes.

PRIORITY CONCERN 11: WATER QUALITY

Goal:

Maintain water quality in waterbodies within the Headwaters Partnership region that falls within current state and federal regulations, taking into account natural variation inherent in unique ecosystems within the estuary; supports healthy aquatic communities; and enhances cultural and environmental ecosystem services.

Objectives:

1. Research and identify acceptable water quality standards for shallow bays in the estuary
    a. Identify natural variation of water for all of estuary
2. Maintain and expand water quality monitoring programs in the estuary, streams, and wetlands
    a. Develop collaborative monitoring strategy that is efficient
    b. Identify which water quality information still needs to be collected, such as new or emerging contaminants.
    c. Increase availability of monitoring data to the public, including providing interpretations of water quality data for the public
    d. Pursue funding to support ongoing monitoring to help identify stressors and track improvements
    e. Include winter sampling
3. Identify and address water quality issues detected via water quality monitoring programs and other research, including but limited to dioxins, mercury/methylation, sulfates, phosphorus, high conductivity, legacy contaminants, turbidity, hypoxia/dissolved oxygen, PFAS, personal care products, pharmaceuticals, E. coli, microplastics, and oily residue emulsified in water at 21st Avenue West
4. Remove water bodies from the Clean Water Act 303(d) impaired waters list through improvement in water quality
5. Address point and non-point source pollution and clean up litter
6. Understand how climate change impacts, including storms, droughts, rising temperatures, and reduced ice cover, affect estuarine processes and subsequent effects on water quality
7. Understand patterns and drivers of change in lake levels and implications for estuary water quality
8. Improve our understanding of hydrodynamics (seiche, currents, internal/surface waves, etc.) on the estuary and effects to the near shore areas of Lake Superior
9. Improve hydrologic connectivity to sheltered bays and disconnected wetlands to address water quality issues such as low dissolved oxygen.
10. Characterize spatial and temporal patterns in water quality, with an emphasis on winter
11. Assess phytoplankton community composition to assess ecosystem health.
12. Implement objectives for Invasive Species objectives for aquatic invasives species control.

13. Evaluate linkages between completed projects and ambient monitoring results to see whether observed condition improvements can be attributed to implemented projects.

PRIORITY CONCERN 12: WILD RICE

Goal:

Increase the abundance and distribution of self-sustaining wild rice within the St. Louis River Estuary to increase opportunities for culturally important harvest, improve fish and wildlife habitat, and enhance Manoomin's resiliency for long-term persistence.

Objectives:

Restoration Objectives

1. Implement the St. Louis River Estuary Manoomin Restoration and Stewardship Plan – an update to the 2014 Wild Rice Restoration Implementation Plan for the St. Louis River Estuary.
    a. Incorporate traditional ecological knowledge into restoration planning and evaluation.
    b. Update restoration site suitability mapping.
    c. Develop a decision framework and threshold triggers for future management actions to support Manoomin restoration and stewardship (e.g., competing vegetation and herbivory management, in particular).
2. Implement the updated plan's Manoomin Restoration Model (MRM).
    a. Metrics/Indicators: wild rice density, acreage, and cultural/community connections.
    b. Tactics: site selection, seeding, herbivory management, vegetation management, and effectiveness monitoring.
3. Use the MRM to facilitate the development of a robust wild rice seedbank that is resilient to changing environmental conditions – the natural dynamics of the estuary ecosystem and stressors related to climate change impacts to coastal wetlands.
4. Develop local education and outreach programs (e.g., seminars, workshops, rice camps, etc.) to recruit future stewards and build community consensus for long-term stewardship.
5. Create story map focusing on historical wild rice beds in the SLRE based on interviews from those who used to rice the estuary to understand how much has truly been lost and what might still be possible if modified, for example, removal of monotypic cattail stands.
6. Identify and develop funding strategies to support Manoomin stewardship and restoration in the St. Louis River Estuary into the future.

Research Objectives:

7. Quantify seed viability in St. Louis River Estuary sediments and define what it means to achieve a resilient Manoomin seed bank.
8. Investigate the prevalence of toxic metals in St. Louis River Estuary wild rice and potential human health impacts from dietary exposure.
9. Determine the density at which wild rice is resilient to herbivory pressure from Canada geese in the

St. Louis River Estuary.

10. Define the spatial dynamics of Canada geese relative to wild rice distribution and quantify the impact of goose removals on annual wild rice seed production.
11. Develop and implement an estuary-wide study to identify the relationship between muskrat activity and factors influencing wild rice persistence (e.g., density, acreage, presence of competing vegetation) at restoration and control sites in the St. Louis River Estuary.
12. Develop a strategy for implementing regular remote sensing data collection to define the extent of wild rice across the St. Louis River Estuary.
13. Identify and evaluate methods for sustaining and enhancing community relationships with wild rice (e.g., recruiting harvesters, stewards, etc.).

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APPENDIX A: Priority Concern Goals and Objectives Team Member List

Priority Concern	Team Member	Team Member Affiliation
Birds	**Annie Bracey**	**University of Minnesota Duluth - Natural Resources Research Institute (UMD-NRRI)**
	Alexis Grinde	UMD-NRRI
	Emilia Kenow	Minnesota Land Trust
	Martha Minchak	MNDNR
	Pat Collins	Minnesota Land Trust
	Sumner Matteson	WDNR
	Steve Kolbe	UMD-NRRI
	Tom Prestby	Audubon Great Lakes
Dredge material management	**Dan Breneman**	**Minnesota Pollution Control Agency**
	Cherie Hagen	Wisconsin Department of Natural Resources (WDNR)
	Dave Grandmaison	WDNR
	Jeff Stollenwerk	Duluth Port Authority
	Jim Luke	US Army Corps of Engineers
	Linda Cadotte	City of Superior
	Melissa Sjolund	Minnesota Department of Natural Resources (MNDNR)
	Ellen Cooney	WDNR
	Kelsey Prihoda	Minnesota Sea Grant
Coastal wetlands	**Kelly Beaster**	**University of Wisconsin - Lake Superior Research Institute**
	Carol Reschke	UMD-NRRI (retired)
	Cherie Hagen	WDNR
	Ellen Cooney	WDNR
	Jeramy Pinkerton	MNDNR
	Kirsten Rhude	Lake Superior Reserve
	Martha Minchak	MNDNR
Community engagement	**Deanna Erickson**	**Lake Superior Reserve**
	Barb Huberty	MPCA
	Katie Williams	US Environmental Protection Agency Great Lakes Toxicology and Ecology Division (USEPA GLTED)
	Lacey Hill Kastern	WDNR
	Linda Cadotte	City of Superior
	Steven Robertson	City of Duluth
	Tom Hollenhorst	USEPA GLTED
Environmental justice & equity	**Molly Wick**	USEPA GLTED
	Barb Huberty	MPCA
	Cherie Hagen	WDNR
	Jodi Slick	Equilibrium3
	Katie Williams	USEPA GLTED
	Steven Robertson	City of Duluth
	Sophia Green	USEPA GLTED
	Ted Angradi	USEPA GLTED (retired)
	Jen Josephs	USEPA GLTED
	Tom Hollenhorst	USEPA GLTED
Fisheries – Brook Trout	**John Lindgren**	**MNDNR**

Priority Concern	Team Member	Team Member Affiliation
	Deserae Hendrickson	MNDNR
	Ann Thompson	South St. Louis Soil and Water Conservation District
	Jeff Jasperson	MPCA
Fisheries - Lake Sturgeon	**Dan Wilfond**	**MNDNR**
	Nick Boygo	1854 Treaty Authority
	Paul Piszczek	WDNR
	Tom Howes	Fond du Lac Band of Lake Superior Chippewa
Hydrologic integrity	**Ann Thompson**	**South St. Louis Soil and Water Conservation District**
	Ben Nicklay	MNDNR
	Ellen Cooney	WDNR
	Lacey Hill Kastern	WDNR
	Tom Estabrooks	MPCA
	Tom Hollenhorst	USEPA GLTED
	Tom Johnson	City of Duluth
	Kari Hedin	Fond du Lac Band of Lake Superior Chippewa
Invasive species	**Lori Seele**	**Duluth CISMA**
	Alexander Selle	WDNR
	Alyssa Bloss	Carlton County Soil and Water Conservation District
	Amanda Weberg	Cook County, Minnesota
	Brandon Van Tassel	Community Action Duluth
	Dara Fillmore	WDNR
	Kelsey Taylor	Fond du Lac Band of Lake Superior Chippewa
	Martha Minchak	MNDNR
	Tyler Kaspar	1984 Treaty Authority
	Zach Stewart	Douglas County, Wisconsin
	Travis Bartnick	Great Lakes Indian Fish and Wildlife Commission
Terrestrial habitat connectivity & integrity	**Pat Collins**	**Minnesota Land Trust**
	Brandon Van Tassel	Community Action Duluth
	Carol Reschke	UMD-NRRI (retired)
	Dave Grandmaison	WDNR
	Kate Kubiak	City of Duluth
	Lacey Hill Kastern	WDNR
	Martha Minchak	MNDNR
	Tom Hollenhorst	USEPA-GLTED
Water quality	**Ellen Cooney**	**WDNR**
	Hannah Ramage	Lake Superior Reserve
	Kaitlin Reinl	Lake Superior Reserve
	Lacey Hill Kastern	WDNR
	Tom Estabrooks	MPCA
Wild rice	**Dave Grandmaison**	**WDNR**
	Carol Reschke	UMD-NRRI (retired)
	Darren Vogt	1854 Treaty Authority
	Kelly Beaster	University of Wisconsin - Lake Superior Research Institute
	Martha Minchak	MNDNR

Note: Bold denotes team leader.