

Lessard-Sams Outdoor Heritage Council

Fiscal Year 2021 / ML 2020 Request for Funding



Date: May 30, 2019

Program or Project Title: St. Louis River Restoration Initiative Phase 7

Funds Requested: \$6,731,200

Manager's Name: Melissa Sjolund

Title: St. Louis River AOC Coordinator

Organization: Minnesota Department of Natural Resources

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County Locations: St. Louis

Eco regions in which work will take place:

- Northern Forest

Activity types:

- Restore

Priority resources addressed by activity:

- Habitat

Abstract:

MNDNR's St. Louis River Restoration Initiative (SLRRI) is a collaborative program enhancing and restoring this unique and valuable resource. The SLRRI's vision for the estuary includes diverse, productive, and healthy aquatic and terrestrial ecosystems of the river and watershed. Contributing to this vision, MNDNR works with partners throughout the 12,000-acre estuary to identify and prioritize key projects and implement previously identified projects that restore 100 acres of priority aquatic and riparian habitat. When Phase 7 is complete, approximately 661 acres of habitat will have been restored, using OHF funds to leverage a substantial amount of federal funding.

Design and scope of work:

The St. Louis River Restoration Initiative (SLRRI) and OHF partnership began in 2014 to achieve fish and wildlife habitat restoration in the St. Louis River Estuary (Estuary) that contributes to the delisting of the St. Louis River Area of Concern (AOC). The partnership has effectively and efficiently restored wetland, stream and open water aquatic habitats. This proposal includes projects identified by the 2002 Lower St. Louis River Habitat Plan (Habitat Plan) and the 2013 St. Louis River Remedial Action Plan. When accomplished, these projects will move toward complete implementation of the vision described in the Habitat Plan and will maintain investments already made in the Estuary. Funding for this phase of the SLRRI will be leveraged with Great Lakes Restoration Initiative (GLRI) funding. The MNDNR will continue to closely coordinate with SLRRI partners to integrate, prioritize, and develop fish and wildlife restoration projects throughout the estuary, building on lessons learned from completed projects. In addition, work on specific project sites within the SLRRI program area for previously identified priority sites will continue. In Phase 7 of the SLRRI, MNDNR will continue to apply its broad partnership to construct 100 acres of restored fish and wildlife habitat.

Mud Lake is a warm water fish and migratory bird restoration project. Mud Lake is an estuarine bay and wetland complex upstream of the US Steel Superfund Site. It is degraded by legacy wood waste and bisected by a railroad causeway. The SLRRI team will work in close coordination with the MPCA, USEPA, and the City of Duluth to address sediment contamination, enhance hydrologic connection, remove legacy wood waste, and restore aquatic ecological function.

Kingsbury and Keene Creeks are trout stream restoration projects. These multi-partnered projects will enhance the creeks' connection to their floodplains, reduce sedimentation, restore trout habitat, and increase resiliency of Estuary restoration efforts currently being completed with earlier OHF appropriations.

Lower Knowlton Creek is a trout stream restoration project. The project will remove a fish and wildlife migration barrier along recently restored Knowlton Creek between the Estuary and Magney-Snively Forest Complex. Proposed work will remove the barrier and restore a natural stream channel.

Which sections of the Minnesota Statewide Conservation and Preservation Plan are applicable to this project:

- H2 Protect critical shoreland of streams and lakes
- H6 Protect and restore critical in-water habitat of lakes and streams

Which other plans are addressed in this proposal:

- Lower St. Louis River Habitat Plan
- U.S. Fish and Wildlife Service Strategic Habitat Conservation Model

Describe how your program will advance the indicators identified in the plans selected:

The Habitat Plan identifies Conservation Targets and projects required to restore the Estuary to a desired condition. SLRRI used the Habitat Plan to identify and prioritize projects contained in this proposal, as well as previously funded projects. The possibility exists to leverage GLRI and City of Duluth funding to present an unparalleled opportunity to accomplish the Habitat Plan's broad, legacy-scale objectives.

MNDNR has collaborated with the USFWS for 20 years to advance habitat restoration in the Estuary. Their participation and guidance has resulted in the inclusion of elements of the Strategic Habitat Conservation Model into the Remedial Action Plan (RAP) for the AOC. The RAP identifies a complete list of management actions needed to remove Beneficial Use Impairments (BUIs) and delist the AOC. The RAP, in conjunction with the Lake Superior Lakewide Action and Management Plan (LAMP), comprise a multi-jurisdictional approach to protecting and restoring the Lake Superior watershed.

Which LSOHC section priorities are addressed in this proposal:

Northern Forest:

- Protect shoreland and restore or enhance critical habitat on wild rice lakes, shallow lakes, cold water lakes, streams and rivers, and spawning areas

Describe how your program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife as indicated in the LSOHC priorities:

MNDNR's habitat restoration efforts in the Estuary will produce the diverse, productive, and healthy aquatic ecosystems that will make it one of the top fishing destinations in Minnesota. This is based on the unparalleled variety of angling opportunities these habitats provide. Few waters in Minnesota have the ability to host destination quality fishing for walleye, muskellunge, smallmouth bass, lake sturgeon and black crappie. By 2025, MNDNR and its local, state and federal partners will have restored more than 1,700 acres of Estuary habitat; MNDNR proposes to continue the next phase of this success story by completing the implementation of the 2002 Lower St. Louis River Habitat Plan. Restorations and enhanced management of the estuary will increase the number, size, and quality of Species of Greater Conservation Need (SGCN) and game fish species as well as improve angler and other recreational access. Outcomes will now include restoration of critical upland habitat for Common Tern and Piping Plover that is identified in the Lake Superior Lakewide Action and Management Plan's Biodiversity Conservation Strategy.

One of the primary outcomes of the work described in this proposal will be habitat restoration and removal of barriers affecting more than 17,800 feet of stream shorelines. These shorelines will provide critical habitat to support all the "indicator species" described in that section.

Describe how the proposal uses science-based targeting that leverages or expands corridors and complexes, reduces fragmentation or protects areas identified in the MN County Biological Survey:

The 1980's were the turning point for the Estuary. Wastewater and sewage treatment plants improved water quality it became clear that the Estuary's fish and wildlife populations could recover if habitat conditions were restored. MNDNR worked with many local, state and federal resource experts and stakeholders to develop the Habitat Plan, a comprehensive science based plan for protecting, restoring and managing fish and wildlife of the St. Louis River Estuary.

MNDNR uses science-based targeting to identify, design, monitor, and ensure the quality of the proposed projects. MNDNR worked with many local, state, tribal and federal resource professional as well as stakeholders to develop the Habitat Plan, which is a

comprehensive science-based plan for protecting, restoring, and managing the Estuary's fish and wildlife habitat. Partners developed the Habitat Plan to guide and prioritize restoration work, and it has been the foundation of the SLRRI.

AOC partners used a source-stressor model to identify impairments to the Estuary. The model identified conservation targets, stresses limiting those targets, and recommended actions to address the source of the stress. All project areas supported by the GLRI also require the development of a Quality Assurance Plan to measure the successful outcomes of the conservation actions.

Restoration Site Teams (RSTs) are developed for each implementation project to identify site-specific restoration targets and objectives. Natural resource managers, ecologists, biologists, and St. Louis River AOC partners associated with the estuary examine conceptual restoration project alternatives and assess and evaluate habitat benefits and tradeoffs between conceptual designs using both qualitative and quantitative measures of habitat value. Site-specific habitat needs and opportunities are also evaluated in the context of Estuary-wide restoration objectives and planned or completed projects. Knowledge transfer from previously completed OHF-funded projects is facilitated in RSTs by engaging local resource experts on multiple SLRRI projects.

Scientists from University of Minnesota, National Oceanic and Atmospheric Administration, U.S. Environmental Protection Agency, U.S. Fish & Wildlife Service, MNDNR, and MPCA continue to monitor and evaluate the Estuary's fish and wildlife populations and habitat to prioritize restoration projects, model expected outcomes of restoration alternatives, and evaluate restoration outcomes.

How does the proposal address habitats that have significant value for wildlife species of greatest conservation need, and/or threatened or endangered species, and list targeted species:

The 12,000 acre St. Louis River Estuary, at the head of Lake Superior, is a unique Minnesota resource. It is the largest source of biological productivity to Lake Superior as well as the world's largest freshwater shipping port. The combination of extensive wetlands, warmer waters, and the connection to Lake Superior resulted in it becoming the primary source of productivity for the western Lake Superior fishery and a critical flyway for waterfowl and other migratory birds. Nearly two-thirds of the estuary's native wetlands have been altered, eliminated or impaired as a result of historic impacts of dredging, filling and waste disposal associated with industrial activities. Although economic uses in the industrialized portion of the Estuary continue, many of the historic problems associated with waste disposal have been addressed through the Clean Water Act and subsequent actions. The proposed projects represent an opportunity to balance economic activities, while restoring the negative impacts of historic uses. Additionally, restorations will directly benefit SGCN and other species by improving habitat quality and extent in strategic locations to maximize benefits to populations.

As the Outdoor Heritage Fund's 2009 25-year framework states, "Success in conservation will depend highly on leveraging traditional and other sources of conservation funding with available OHF funds and coordinating efforts with conservation partners." The proposed project is integrated with local, state, federal, tribal and non-government partners that have worked together to advance projects and secure non-OHF funding at of approximately 50%. Minnesota's legacy funds are an integral part of the overall strategy to restore the health of this unique resource.

Identify indicator species and associated quantities this habitat will typically support:

Mallards are commonly used indicator species for numerous state waterfowl plans. The Upper Mississippi River and Great Lakes Region Joint Venture uses a model of one mallard per 2.47 wetland acres to estimate habitat needs (noting that upland habitat for nesting is also needed). Proposed projects restore 100 total wetland acres, supporting 40 mallards.

Trumpeter swans are a readily recognizable feature on wetlands and their restoration is a modern wildlife management success story. Each 150 acres of wetlands protected, restored, or enhanced may support one swan pair. Proposed projects restore 100 total wetland acres, in a 300 acre wetland complex that will support approximately three trumpeter swan pairs.

Trout (all species) serve as indicator species for regional trout streams while walleye, muskie, and northern pike are indicator species for lakes. The estimates below are based on population averages calculated for total project areas of 100 wetland and access improvements to 12 stream acres. These averages are generated from available data and published sources, and do not capture the variability inherent in aquatic populations. Natural populations, including healthy populations with good habitat, vary among locations, and also rise and fall within lakes and rivers.

- Trout (all species) = 480 lbs
- Walleye = 226 adults
- Muskie = 22 adults
- Northern Pike = 1132 adults

Outcomes:

Programs in the northern forest region:

- Improved availability and improved condition of habitats that have experienced substantial decline *MNDNR evaluates habitat restoration effectiveness using a variety of physical and biologic metrics measured pre- and post-project. Completed restoration associated*

with the AOC will be measured in acres of habitat restored and evaluated to remove beneficial use impairments and ultimately delist the AOC.

How will you sustain and/or maintain this work after the Outdoor Heritage Funds are expended:

MNDNR Duluth Area Fisheries manages the Lower St. Louis River through regular monitoring, assessment and regulation. They are partnered with the WDNR, the MPCA, USEPA MED Lab, and NOAA's National Estuary Research Reserve in the effort to monitor and address issues associated with the long-term maintenance of habitat restoration outcomes in the estuary.

St. Louis River habitat restoration projects are designed to be maintained by the natural processes that define these systems. Barring catastrophic events, these projects will not require future adjustment, or clean-up. Restoration of submerged aquatic vegetation beds at locations such as the ones proposed will consider the water depth, substrate type and wave energy environment required to maintain these systems. Similarly, stream restoration at proposed locations will take into account all pertinent morphological and geographical information to produce an appropriate and resilient outcome.

Healthy and robust native communities are resistant to invasion by exotic species. If invasive species successfully establish on a site they can disrupt the food web of the native community and result in reduced populations of desirable native species. Restoration of native plant communities will inhibit the establishment of invasives and MNDNR is partnered with the other entities described above to control them.

Explain the things you will do in the future to maintain project outcomes:

Year	Source of Funds	Step 1	Step 2	Step 3
All Years	Fish & Wildlife Game & Fish fund	Regular Surveys/monitoring		
All Years	WDNR, MPCA, USEPA, NOAA	Long-term monitoring at specific sites		

What is the degree of timing/opportunistic urgency and why it is necessary to spend public money for this work as soon as possible:

All work in the AOC is scheduled to be completed by 2021 and the promised remaining federal support from AOC-related GLRI funds will be awarded soon. As described earlier, the SLRRI is transitioning into the completion of critical post-AOC work identified in the Habitat Plan. The SLRRI team has already begun to negotiate with non-AOC programs within the GLRI to assure that their interests are aligned with the necessary restoration actions identified in the Habitat Plan. It is anticipated that critical fund leveraging will have to be established between the partnering entities (OHF/Federal). Negotiations specific to Mud Lake, Keene Creek, and Lower Knowlton Creek are already under way and non-OHF funding for Kingsbury Creek has already been secured.

Does this program include leverage in funds:

No

Relationship to other funds:

- Not Listed

Describe the relationship of the funds:

Not Listed

Per MS 97A.056, Subd. 24, Any state agency or organization requesting a direct appropriation from the OHF must inform the LSOHC at the time of the request for funding is made, whether the request is supplanting or is a substitution for any previous funding that was not from a legacy fund and was used for the same purpose:

No, this request is not supplanting any previous funding.

Describe the source and amount of non-OHF money spent for this work in the past:

Appropriation Year	Source	Amount
2012	Federal Dollars (NOAA, NFWF, USEPA, USFWS)	\$2,640,000
2014	Federal Dollars (NOAA, USEPA)	\$600,000

Activity Details

Requirements:

If funded, this proposal will meet all applicable criteria set forth in MS 97A.056 - **Yes**

Will restoration and enhancement work follow best management practices including MS 84.973 Pollinator Habitat Program - **Yes**

Is the restoration and enhancement activity on permanently protected land per 97A.056, subd 13(f), tribal lands, and/or public waters per MS 103G.005, Subd. 15 - **Yes (Public Waters)**

Do you anticipate federal funds as a match for this program - **Yes**

Are the funds confirmed - **No**

What is the approximate date you anticipate receiving confirmation of the federal funds - **January 2020**

Land Use:

Will there be planting of corn or any crop on OHF land purchased or restored in this program - **No**

Accomplishment Timeline

Activity	Approximate Date Completed
Project prioritization, integration, and development; site-specific coordination	June 2025
Kingsbury Creek - Reduce sedimentation, restore cold-water fisheries habitat and enhance recreational fishing	December 2022
Mud Lake - Enhance hydrologic connection, remove legacy wood waste and restore ecological functions	December 2021
Keene Creek - Reduce sedimentation, restore cold-water fisheries habitat and enhance recreational fishing	December 2022
Lower Knowlton Creek - Remove causeway and restore a natural stream channel	December 2023

Budget Spreadsheet

Total Amount of Request: \$6,731,200

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$948,900	\$0		\$948,900
Contracts	\$5,500,000	\$0		\$5,500,000
Fee Acquisition w/ PILT	\$0	\$0		\$0
Fee Acquisition w/o PILT	\$0	\$0		\$0
Easement Acquisition	\$0	\$0		\$0
Easement Stewardship	\$0	\$0		\$0
Travel	\$9,500	\$0		\$9,500
Professional Services	\$100,000	\$0		\$100,000
Direct Support Services	\$128,700	\$0		\$128,700
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$35,600	\$0		\$35,600
Supplies/Materials	\$8,500	\$0		\$8,500
DNR IDP	\$0	\$0		\$0
Total	\$6,731,200	\$0		\$6,731,200

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
FAW AOC Project Manager	1.00	3.00	\$358,500	\$0		\$358,500
EWR AOC Coordinator	0.50	3.00	\$195,400	\$0		\$195,400
EWR Restoration Consultant	0.50	3.00	\$187,800	\$0		\$187,800
FAW OAS	0.80	3.00	\$207,200	\$0		\$207,200
Total	2.80	12.00	\$948,900	\$0		\$948,900

Amount of Request: \$6,731,200

Amount of Leverage: \$0

Leverage as a percent of the Request: 0.00%

DSS + Personnel: \$1,077,600

As a % of the total request: 16.01%

Easement Stewardship: \$0

As a % of the Easement Acquisition: -%

How did you determine which portions of the Direct Support Services of your shared support services is direct to this program:

Used Direct and Necessary calculator provided by DNR OHF staff.

What is included in the contracts line?

The Contracts budget includes funds to contract the construction of the Mud Lake, Keene Creek, Kingsbury Creek and Lower Knowlton Creek projects.

Does the amount in the travel line include equipment/vehicle rental? - No

Explain the amount in the travel line outside of traditional travel costs of mileage, food, and lodging:

n/a

Describe and explain leverage source and confirmation of funds:

We have not yet included any leverage amount. We anticipate leverage from multiple sources. We have requested that US EPA include the Mud Lake project as part of their AOC funding support budget as a necessary Management Action to complete the SLR Remedial

Action Plan. Additional sources of leverage funding

Does this proposal have the ability to be scalable? - Yes

Tell us how this project would be scaled and how administrative costs are affected, describe the “economy of scale” and how outputs would change with reduced funding, if applicable:

In order to delist the AOC by 2025, it is critical that the funding for Mud Lake be secured. It is highly desirable to acquire funding for critical non-AOC projects in order to display to the federal non-AOC GLRI partners that the state is committed to supporting these projects.

Output Tables

Table 1a. Acres by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	0	0	0	100	100
Protect in Fee with State PILT Liability	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0
Protect in Easement	0	0	0	0	0
Enhance	0	0	0	0	0
Total	0	0	0	100	100

Table 2. Total Requested Funding by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	\$0	\$0	\$0	\$6,731,200	\$6,731,200
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$6,731,200	\$6,731,200

Table 3. Acres within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	0	0	0	0	100	100
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	0	0	0	0	0	0
Total	0	0	0	0	100	100

Table 4. Total Requested Funding within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	\$0	\$0	\$0	\$0	\$6,731,200	\$6,731,200
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$0	\$0	\$0	\$0	\$6,731,200	\$6,731,200

Table 5. Average Cost per Acre by Resource Type

Type	Wetlands	Prairies	Forest	Habitats
Restore	\$0	\$0	\$0	\$67,312
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0

Table 6. Average Cost per Acre by Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	\$0	\$0	\$0	\$0	\$67,312
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$0	\$0

Automatic system calculation / not entered by managers

Target Lake/Stream/River Feet or Miles

17800

I have read and understand Section 15 of the Constitution of the State of Minnesota, Minnesota Statute 97A.056, and the Call for Funding Request. I certify I am authorized to submit this proposal and to the best of my knowledge the information provided is true and accurate.

Parcel List

Explain the process used to select, rank and prioritize the parcels:

The SLRRI is a partner to the Great Lakes Restoration Initiative (GLRI) and the Area of Concern (AOC) Process. As such, there is a Remedial Action Plan that identifies projects that need to be completed in order to delist the AOC. The list of actions was developed by a broad group of partner agencies and groups. The MNDNR was identified as the Agency Lead on several of the projects on the action item list. The MNDNR has already received funding for projects on the list and completed restoration at five of those projects. Funding Mud Lake construction is prioritized in order to delist the AOC by the goal date of 2025.

After completion of the AOC delisting process, additional work identified in the Lower St. Louis River Habitat Plan will need to be completed to achieve the full habitat restoration potential of the estuary. Continued progress on non-AOC projects may be re-scaled, but remains critical to display to our Partners, including the non-AOC federal GLRI, that the state is committed to continued success in the Estuary.

Section 1 - Restore / Enhance Parcel List

St. Louis

Name	TRDS	Acres	Est Cost	Existing Protection?
Keene Creek	04915212	0	\$1,500,000	Yes
Kingsbury Creek	04915214	0	\$0	Yes
Lower Knowlton Creek	04915223	0	\$500,000	Yes
Mud Lake	04815202	100	\$3,500,000	Yes

Section 2 - Protect Parcel List

No parcels with an activity type protect.

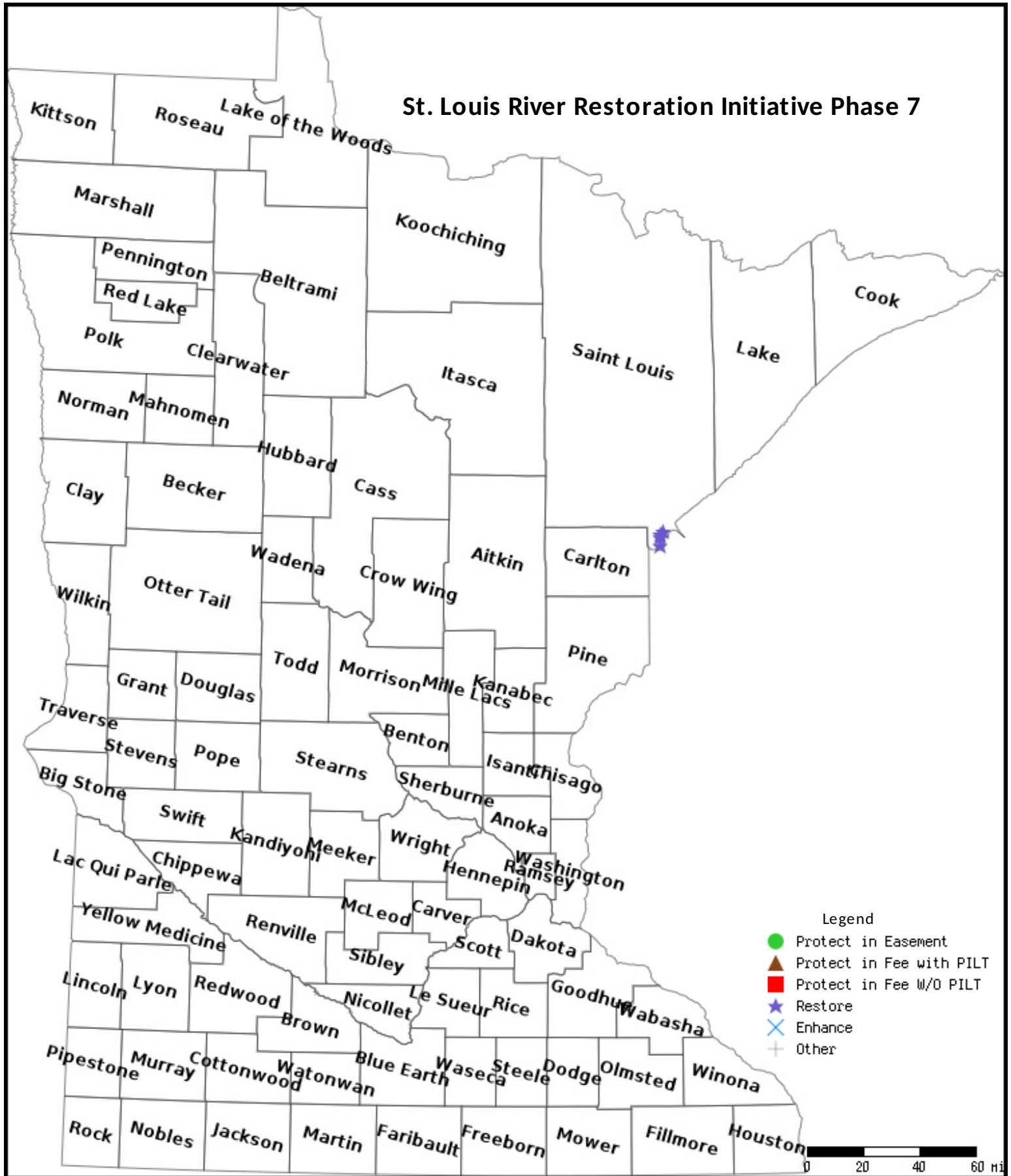
Section 2a - Protect Parcel with Bldgs

No parcels with an activity type protect and has buildings.

Section 3 - Other Parcel Activity

No parcels with an other activity type.

Parcel Map



Data Generated From Parcel List

Lessard-Sams Outdoor Heritage Council
 Fiscal Year 2021 / ML 2020 Request for Funding
 St. Louis River Restoration Initiative Phase 7 – Implementation Proposal Illustration

MNDNR’s St. Louis River Restoration Initiative (SLRRI) is a collaborative program that has successfully enhanced and restored the ecological diversity of this unique and valuable resource. The SLRRI’s vision for the Estuary includes diverse, productive, and healthy aquatic and terrestrial ecosystems of the river and watershed. Contributing to this vision, MNDNR will restore 100 acres of priority aquatic and riparian habitat at multiple sites in the Estuary in partnership with the Minnesota Land Trust. When Phase 7 is complete, approximately 627 acres of habitat will have been restored by using OHF funds to leverage a substantial amount of federal funding.

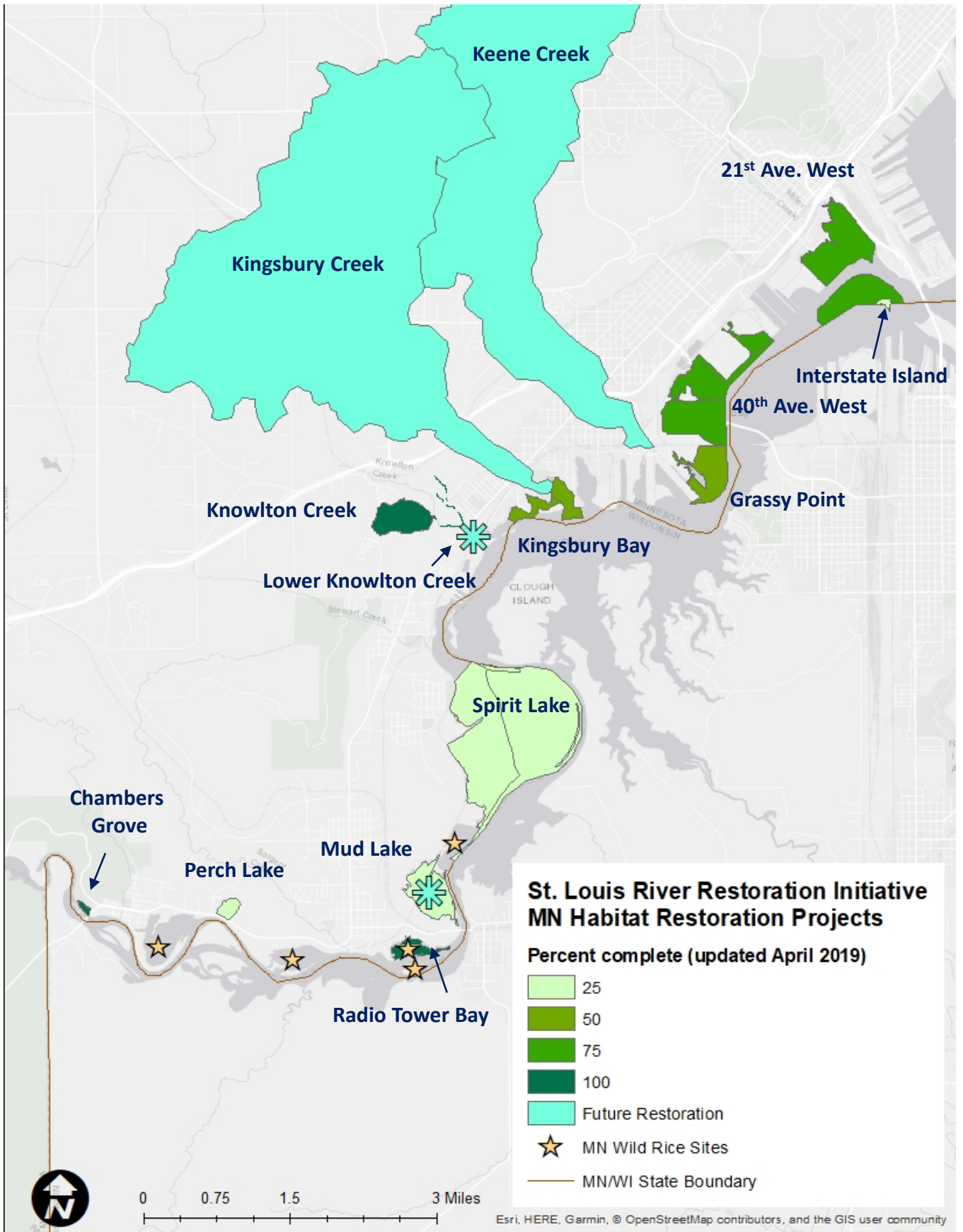
Proposed Projects:

Project	Total Acres	Completion Date	Outcome
Kingsbury Creek	5	December 2020	Reduce sedimentation, restore cold-water fisheries habitat and enhance recreational fishing
Mud Lake	130	December 2021	Enhance hydrologic connection, remove legacy wood waste and restore ecological functions
Keene Creek	10	December 2022	Reduce sedimentation, restore cold-water fisheries habitat and enhance recreational fishing
Lower Knowlton Creek	1	December 2023	Remove causeway and restore a natural stream channel
Total	146*		

*Total Acres includes acreage accounted for in this proposal and in prior approved awards to reflect entire project area.

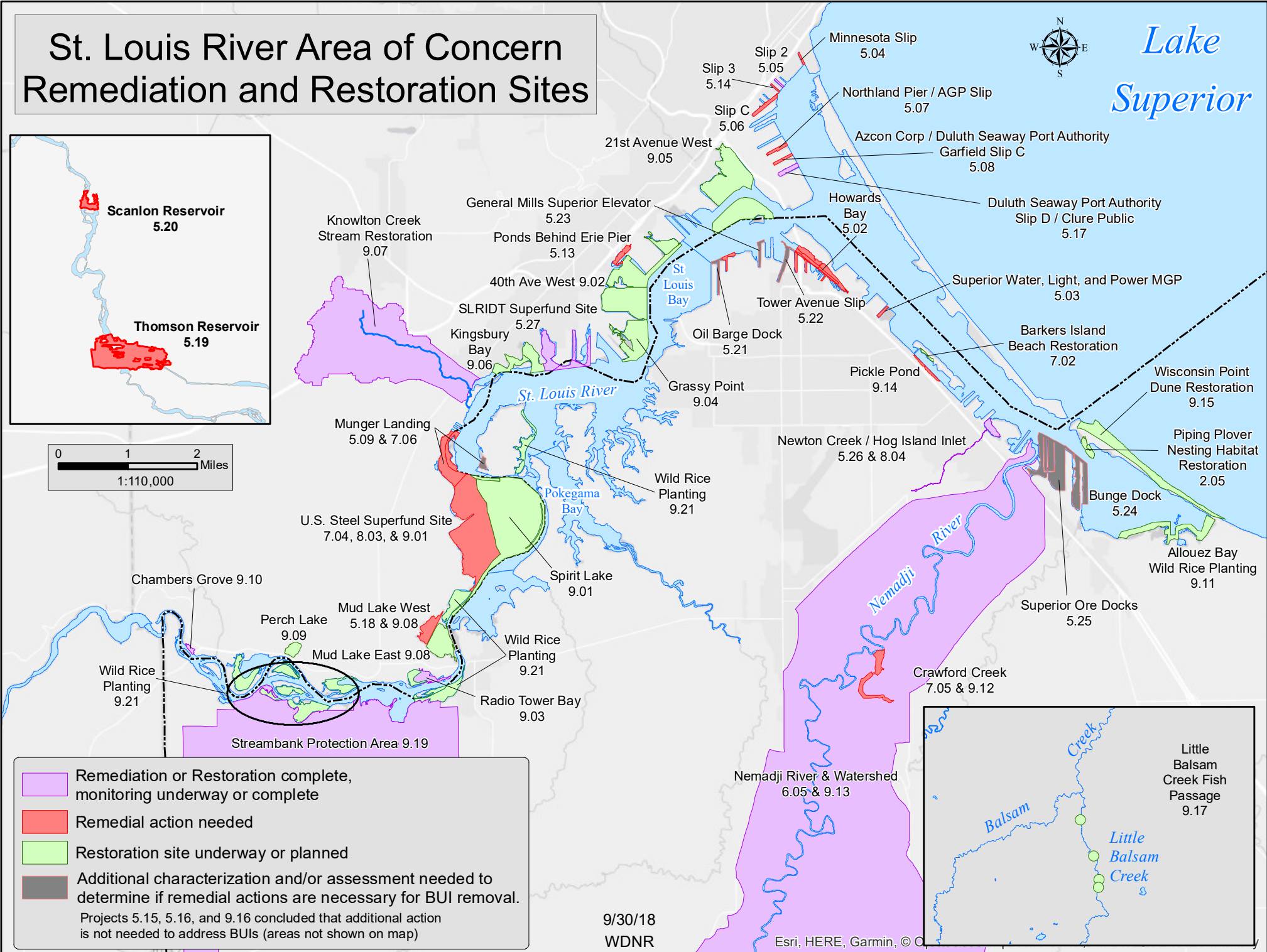
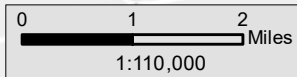
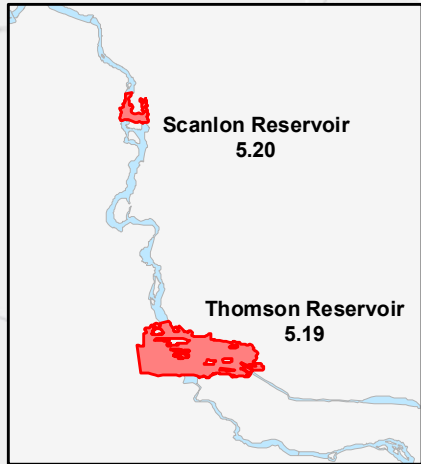
Past support from the OHF has been applied to several projects critical to restoring estuary fish and wildlife habitat including:

Project	Acres	Status	Outcome
Radio Tower Bay	30	Completed	Wood waste removed from estuary wetland
Chambers Grove	7	Completed	Sturgeon and walleye Spawning habitat improvement
Wild Rice	133	In progress	Restoring historic wild rice beds
Interstate Island WMA	2	Completed	Restored critical tern nesting habitat
Interstate Island WMA	5	In Progress	Piping Plover and Common Tern critical habitat restoration
Knowlton Creek	43	Completed	Restored cold-water trout stream
Kingsbury Bay/Grassy Point	240	In Progress	Restore sheltered bay (wood waste and sedimentation)
Perch Lake	21	In Progress	Restore hydraulic connectivity and fish habitat
Total	481		



St. Louis River Area of Concern Remediation and Restoration Sites

Lake Superior

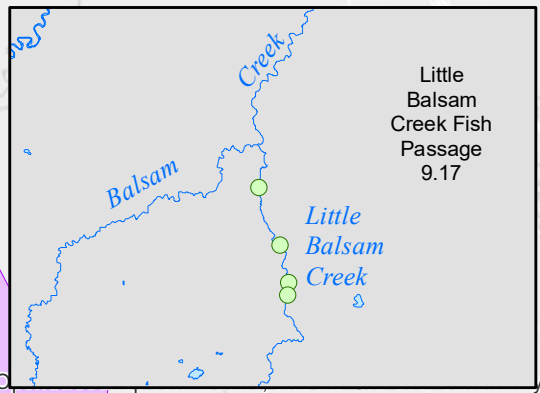


- Remediation or Restoration complete, monitoring underway or complete
- Remedial action needed
- Restoration site underway or planned
- Additional characterization and/or assessment needed to determine if remedial actions are necessary for BUI removal.

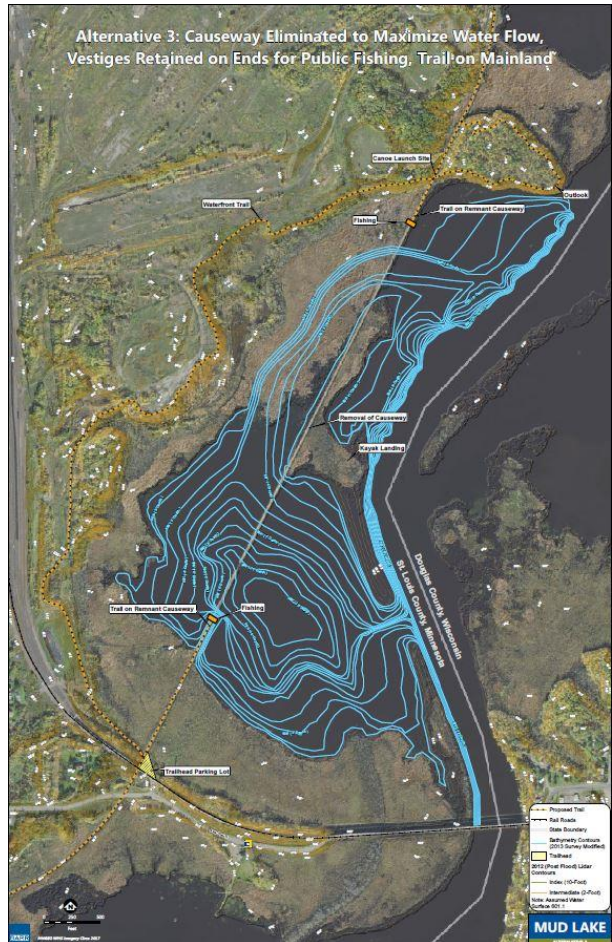
Projects 5.15, 5.16, and 9.16 concluded that additional action is not needed to address BUIs (areas not shown on map)

9/30/18
WDNR

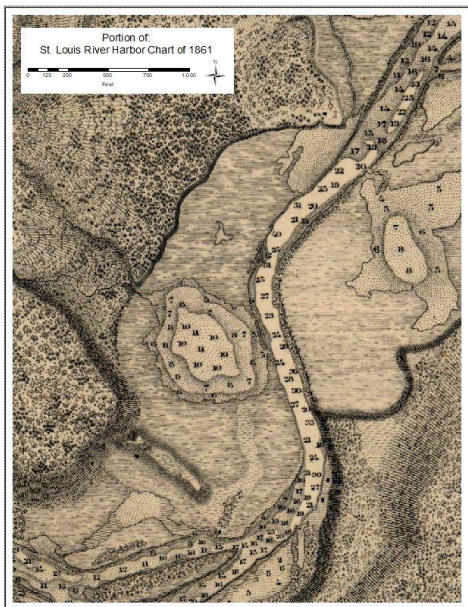
Esri, HERE, Garmin, ©



Mud Lake Concept Designs Assessment - sample figures: Two of the six alternatives examined



Map of Mud Lake in 1861



Air Photo of Mud Lake in 1961

