Lessard-Sams Outdoor Heritage Council
Laws of Minnesota 2012 Final Report

Date: November 08, 2017

Program or Project Title: Lower St. Louis River Habitat Restoration

Funds Recommended: $3,670,000

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Legislative Citation: ML 2012, Ch. 264, Art. 1, Sec. 2, Subd. 5(d)

Appropriation Language: $3,670,000 in the second year is to the commissioner of natural resources to restore habitat in the lower St. Louis River estuary. A list of proposed projects must be provided as part of the required accomplishment plan.

County Locations: St. Louis

Regions in which work was completed:

- Northern Forest

Activity types:

- Restore

Priority resources addressed by activity:

- Habitat

Summary of Accomplishments:

Radio Tower Bay: 115,000 cubic yards of wood material was removed to increase water depth, provide greater habitat diversity, promote native aquatic vegetation and increase recreational access.

Knowlton Creek: 6,500 linear feet of degraded stream was restored by reshaping and creating new stream channels; constructing instream structures; and native planting and seeding to stabilize the stream and minimize sediment into the Estuary.

21st Ave W/Interstate Island: Restored 2 acres of critical nesting habitat for the Common Tern and Piping Plover.

Wild Rice: Restored 133 acres of wild rice in the St. Louis River Estuary.

Process & Methods:

Radio Tower Bay
Historic mill waste (slabs, boards and wood fragments) were removed from the Bay to restore an ecologically functional sheltered bay with optimum diversity of depth. Non-OHF funds were applied to complete feasibility and design in order to optimize application of construction funds. The resulting sheltered bay provides critical coastal wetland habitat for many species of fish and wildlife that utilize the St. Louis River estuary. Wild rice was also established in the bay after construction as part of the separate Wild Rice Restoration Project.

Prior to restoration activities, wood waste covered almost the entire open-water portion of the bay. Wood waste was also present

under areas of emergent vegetation. Depth of wood waste ranged from 0.2 feet to 3.3 feet. The average water depth was approximately one foot. Although the bay was relatively shallow, submergent and emergent vegetation were only present along the perimeter of the bay. Shallow water depths also limited ecological function of the bay as well as its recreational value to anglers and other boaters.

Approximately 115,000 cubic yards of wood waste and wood sediment mixes were removed from Radio Tower Bay. The material was pumped to a dewatering site on US Steel property and was beneficially reused to restore their Superfund site after remediation. The Project resulted in increasing the average water depth of the bay from one foot to 3.7 feet and increased the maximum depth from 2.3 feet to 7.4 feet. A 5.5-acre area with an average water depth of 7.5 feet and channel depth of 5.0 feet will act as a connection between the St. Louis River and the bay, which creates off-river, overwintering fish habitat and improves access for boaters. The bed of Radio Tower Bay is now composed of native silt, unconsolidated organic matter, and clay substrates that have been exposed by the removal of wood waste. Wild Rice was seeded in approximately 15 acres of Radio Tower Bay in 2015 and 2016. Previously seeding areas will be reseeded in 2017 if necessary.

All objectives were met and all construction activities went as planned. The technique to grind up wood and sediment mixes and hydraulically pump them to a dewatering facility for drying was revolutionary. The resulting clean organic material was deemed highly desirable as a substrate to restore remediated areas on the US Steel Superfund Site. After removal of material, the dewatering facility will continue to function and will be used to dewater wood waste from Mud Lake (ML2018 OHF proposal), which will substantially reduce the cost of the project.

Knowlton Creek
The Knowlton Creek Watershed Project restored and enhanced approximately 6,500 linear feet of cold-water stream habitat using Natural Channel Design techniques. Construction outcomes were successful in eliminating erosion and transport of sediment along all reaches restored. Brook trout migration was established or enhanced along 3,000 feet of the stream (the remaining length was too steep). The Project was completed after Spirit Mountain Recreation Area constructed water control structures at the base of their ski hill to transport excess runoff away from Knowlton Creek and directly to the estuary through the pipe used to transport water from the estuary for snow making. This was a revolutionary partnership and methodology. The Project was designed through a MNDNR/USACE partnership with no OHF funding. The restoration methodology applied was a geomorphologic approach appropriate for the hydrology following the Natural Channel Design methodology (Applied River Morphology, Rosgen, 1996).

Construction of in-stream structures (boulder jam steps, boulder jam riffles, toe wood, pocket pools and log vanes with boulder hooks) will improve aquatic habitat diversity and stabilize the bed. Native upland grasses and forbes were planted as well as approximately 15,000 trees along the riparian corridor. During construction, MNDNR, Stantech, Veit/Cardno's field staff worked together to compile construction observation reports and note deviations from the site plans. Overall, the project implementation partners were very effective at addressing project level circumstances. There were a number of design changes that resulted from conditions encountered in the field. Coordination with project partners such as the City of Duluth, Cloquet Pumping Station, Spirit Mountain, MNDOT, private landowners, as well as, resource professionals within the MNDNR, MPCA and USACE was key to the success of the project. In some instances, earlier coordination of the more critical elements of the project would have eliminated some of the additional implementation time needed to complete the restoration.

21st Ave W/Interstate Island
The scope of Interstate Island was to restore colonial waterbird nesting and young rearing habitat through the addition of sand and gravel, vegetation management, and management of the ring-billed population, thereby contributing to implementation of Actions 1.32 and 1.361 in the Recovery Plan for the Great Lakes Piping Plover. Reproductive success of Common Terns nesting on Interstate Island was degraded due to the low elevation of part of the island, vegetation encroachment, and competition for nesting space from ring-billed gulls.

The Project was designed by MNDNR with no OHF funding. The contractor placed 730 linear feet of temporary silt fencing, 3,276 cubic yards of clean beach sand, 610 cubic yards of cobble rip-rap, 28 cubic yards of surface amendments (pebbles & gravel), and 620 linear feet of sediment control log. MN & WDNR staff and volunteers removed all fenced gull exclosures and string grids prior to construction. These were replaced in spring of 2016 as part of regular departmental Piping Plover/Common Tern monitoring and management efforts. Common Terns have been successfully using the enhanced habitat since the Project was completed.

Wild Rice (Rask Bay)
A total of 133 acres of wild rice was restored at several locations in the St. Louis River estuary in 2015 and 2016. Previously seeded location were reseeded in 2017 as needed. Additionally, WDNR and the MN Land Trust restored 83 acres of wild rice beds on the Wisconsin side of the estuary. National Fish & Wildlife Foundation applied $400K and no OHF funding was applied to restoration work on the Wisconsin side of the estuary. A total of 216 acres is in the process of being restored on both sides of the estuary as part of this cooperative project between WDNR and MNDNR. Yearly monitoring and reports are being completed to evaluate all previously seeded locations and determine additional sites for implementation in future years. Geese depredation has been an issue to the success of reseeding efforts and the Project partners have initiated an effort to address this problem beginning in 2017.

Explain Partners, Supporters, & Opposition:

The MN Land Trust assisted with the design, contracting, construction and project oversight at Radio Tower Bay with funds from NOAA and USEPA. MNDNR staff provided oversight for Radio Tower Bay.

The MNDNR coordinated and managed Knowlton Creek with USACE, Sprit Mountain Recreation Area, City of Duluth, and the MPCA. Funding for construction was provided by the National Fish & Wildlife Foundation, USEPA and OHF.

The MNDNR coordinated and managed the Interstate Island Project, which was a partnership between MNDNR, WDNR, USFWS and OHF.

Wild Rice restoration was completed through a partnership between MNDNR, MN Land Trust, Fond du Lac Resources Management, 1854 Treaty Authority and WDNR. MNDNR directed funds to Fond du Lac Resource Management to complete all elements of the project.

There was no opposition to any of the OHF funded projects.

Additional Comments:

Exceptional challenges, expectations, failures, opportunities, or unique aspects of program

Earlier coordination of the more critical elements of these projects would have eliminated some of the additional implementation time needed to complete restoration. As a result, the planning process was improved with earlier integration of key partners during the design phase and additional review time needed to secure permits and access agreements was incorporated into the planning process for future projects.

Our design engineer for Knowlton Creek was not able to provide construction engineering oversight and resulted in additional staff time needed to complete the project.

Other Funds Received:

- Clean Water Fund
- Federal funds

How were the funds used to advanced the program:

MNDNR was able to leverage funds from multiple sources to implement St. Louis River Restoration projects. A total of $2,800,000 was secured to complete advance planning, design and construction of the proposed project components.

Leveraged sources from federal partners

Radio Tower Bay: $1,500,000 from NOAA for the construction of Phase II of the project

Knowlton Creek: $1,100,000 total - $400,000 from National Fish & Wildlife Foundation/Save Our Great Lakes for restoration of the tributaries and $700,000 from USEPA for restoration of the main stem of Knowlton Creek

21st Ave W/Interstate Island: $40,000 from US Fish & Wildlife Service

Leveraged sources from Clean Water Fund
Wild Rice Restoration: Clean Water Legacy ($129,580) for Wild Rice study in St. Louis River Estuary and seeding

What is the plan to sustain and/or maintain this work after the Outdoor Heritage Funds are expended:

Habitat restoration projects completed in the St. Louis River estuary as part of the SLRRI and supported by the Legacy Amendment are designed to be maintained by the natural processes that define this system and it is not anticipated that long-term maintenance will be required. Post-project monitoring for all Area of Concern (AOC) projects will be completed through 2025 with funding support from the USEPA. Three projects completed as part of this appropriation (Radio Tower Bay, Knowlton Creek and 21st Avenue West) will be included in this AOC monitoring project. After 2025, natural resources will be monitored as part of on-going programs by the MNDNR. This will include annual fisheries indexing within the St. Louis River estuary and periodic monitoring of fisheries resources of Knowlton Creek. Budget calculations for future natural resource management by MNDNR is difficult to calculate, but this work will be covered with existing MNDNR funds and programs. Additional work at Interstate Island is needed and it will be advanced by the MNDNR. The Wild Rice Restoration Project will continue to be advanced through the existing partnership between State, Federal and Tribal resource management entities.

Outcomes:

The original accomplishment plan stated the program would

Programs in the northern forest region:

- Restoration of submerged aquatic vegetation beds, emergent wetlands and other habitats associated with river flats and shallow-sheltered bays directly contributes to desired long term outcomes for providing healthy terrestrial and aquatic habitat for fish, game and other wildlife species in the lower St. Louis River estuary by addressing limiting factors such as removing industrial waste and establishing native vegetation. Restoration of submerged aquatic vegetation beds, emergent wetlands and other habitats associated with river flats and shallow-sheltered bays is expected to help achieve desired long-term outcomes for prolific fish, game and other wildlife species in the lower St. Louis River estuary by improving the biological productivity within the project limits. Restoration of connectivity and stream habitats for brook trout in Knowlton Creek contributes to prolific fish, game and other wildlife species in the lower St. Louis River by improving access to additional spawning

How will the outcomes be measured and evaluated?

MNDNR Fisheries staff are conducting sampling on the St. Louis River Estuary to monitor fish recruitment and abundance of various fish species. Lake Sturgeon and Muskie were tagged beginning in 2016 and netting & electrofishing assessments will be conducted every three years for black crappie, bluegill, smallmouth bass and muskellunge since 2008. The MPCA is currently contracting to complete post-project sampling activities that will be used to assess the post-project benthic macroinvertebrate community, evaluate sediment quality, sample post-project aquatic macrophyte assemblages, measure riparian corridor stability of a restored stream and aquatic community for all St. Louis River AOC sites beginning 2018.

Budget Spreadsheet

Final Budget line item reallocations are allowed up to 10% and do not need require an amendment to the Accomplishment Plan

Total Amount: $3,670,000

Budget and Cash Leverage

Budget Name	Request	Spent	Cash Leverage (anticipated)	Cash Leverage (received)	Leverage Source	Total (original)	Total (final)
Personnel	$300,000	$300,100	$150,000	$800	EPA-GLRI Capacity	$450,000	$300,900
Contracts	$3,259,800	$3,258,000	$1,879,000	$2,800,000	NOAA, USFWS, NFWF, USEPA-GLRI	$5,138,800	$6,058,000
Fee Acquisition w/ PILT	$0	$0	$0	$0		$0	$0
Fee Acquisition w/o PILT	$0	$0	$0	$0		$0	$0
Easement Acquisition	$0	$0	$0	$0		$0	$0
Easement Stewardship	$0	$0	$0	$0		$0	$0
Travel	$10,000	$2,200	$0	$0		$10,000	$2,200
Professional Services	$0	$32,300	$0	$0		$0	$32,300
Direct Support Services	$70,200	$66,400	$0	$0		$70,200	$66,400
DNR Land Acquisition Costs	$0	$0	$0	$0		$0	$0
Capital Equipment	$0	$0	$0	$0		$0	$0
Other Equipment/Tools	$0	$200	$0	$0		$0	$200
Supplies/Materials	$30,000	$9,700	$0	$0		$30,000	$9,700
DNR IDP	$0	$0	$0	$0		$0	$0
Total	$3,670,000	$3,668,900	$2,029,000	$2,800,800		$5,699,000	$6,469,700

Personnel

Position	FTE	Over # of years	Spent	Cash Leverage	Leverage Source	Total
Program Coordinator	0.50	3.00	$0	$800	EPA-GLRI Capacity	$800
Administrative Assistant	0.50	3.00	$124,700	$0		$124,700
Project Manager	0.75	3.00	$175,400	$0		$175,400
Total	1.75	9.00	$300,100	$800		$300,900

Explain any budget challenges or successes:

All restoration projects constructed as part of this appropriation were completed with only alterations to the budget and contracting processes that would be considered typical. Construction cost overruns were less than 10% of the total budget and less than the contingency budgets that were available for each project. Project outcomes were magnified within the landscape through partnerships with the City of Duluth, Spirit Mountain Recreation Authority, Wisconsin DNR and Tribal partners. The specific extent of these magnifications cannot be explained in this limited space. All budget adjustments to the appropriation were completed in an appropriate and timely manner.

All revenues received by the recipient that have been generated from activities on land with money from the OHF:

Total Revenue: $0

Revenue Spent: $0

Revenue Balance: $0

- E. This is not applicable as there was no revenue generated.

Output Tables

Table 1a. Acres by Resource Type

Type	Wetlands (original)	Wetlands (final)	Prairies (original)	Prairies (final)	Forest (original)	Forest (final)	Habitats (original)	Habitats (final)	Total (original)	Total (final)
Restore	0	0	0	0	0	0	200	208	200	208
Protect in Fee with State PILT Liability	0	0	0	0	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0	0	0	0	0
Enhance	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	200	208	200	208

Table 2. Total Funding by Resource Type

Type	Wetlands (original)	Wetlands (final)	Prairies (original)	Prairies (final)	Forest (original)	Forest (final)	Habitats (original)	Habitats (final)	Total (original)	Total (final)
Restore	$0	$0	$0	$0	$0	$0	$3,670,000	$3,668,900	$3,670,000	$3,668,900
Protect in Fee with State PILT Liability	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Enhance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$3,670,000	$3,668,900	$3,670,000	$3,668,900

Table 3. Acres within each Ecological Section

Type	Metro Urban (original)	Metro Urban (final)	Forest Prairie (original)	Forest Prairie (final)	SE Forest (original)	SE Forest (final)	Prairie (original)	Prairie (final)	N Forest (original)	N Forest (final)	Total (original)	Total (final)
Restore	0	0	0	0	0	0	0	0	200	208	200	208
Protect in Fee with State PILT Liability	0	0	0	0	0	0	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0	0	0	0	0	0	0
Enhance	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	200	208	200	208

Table 4. Total Funding within each Ecological Section

Type	Metro Urban (original)	Metro Urban (final)	Forest Prairie (original)	Forest Prairie (final)	SE Forest (original)	SE Forest (final)	Prairie (original)	Prairie (final)	N Forest (original)	N Forest (final)	Total (original)	Total (final)
Restore	$0	$0	$0	$0	$0	$0	$0	$0	$3,670,000	$3,668,900	$3,670,000	$3,668,900
Protect in Fee with State PILT Liability	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protect in Fee W/O State PILT Liability	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Protect in Easement	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Enhance	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$3,670,000	$3,668,900	$3,670,000	$3,668,900

Target Lake/Stream/River Feet or Miles (original)

10

Target Lake/Stream/River Feet or Miles (final)

6,500 feet

Explain the success/shortage of acre goals:

An additional 8 acres was amended to the Accomplishments Plan to represent the restoration of wetlands associated with the Knowlton Creek Watershed Project.

Parcel List

Section 1 - Restore / Enhance Parcel List

St. Louis

Name	TRDS	Acres	Total Cost	Existing Protection?	Description
21st Ave West Complex	04915204	2	$123,967	Yes	Aquatic habitat restoration
Knowlton Creek	04915213	43	$568,042	Yes	Trout Stream Restoration
Radio Tower Bay	04815211	30	$2,279,800	Yes	Aquatic habitat restoration
Rask Bay (Wild Rice)	04815209	133	$67,250	Yes	Aquatic habitat restoration

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.

Completed Parcel: 21st Ave West Complex

# of Total Acres:	2
County:	St. Louis
Township:	049
Range:	15
Direction:	2
Section:	04
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	
# of Acres: Prairie/Grassland:	
Amount of Shorline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	$123,967

Completed Parcel: Knowlton Creek

# of Total Acres:	43
County:	St. Louis
Township:	049
Range:	15
Direction:	2
Section:	13
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	
# of Acres: Prairie/Grassland:	
Amount of Shorline:	6500 (Linear Feet)
Name of Adjacent Body of Water (if applicable):	St. Louis River
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	$568,042

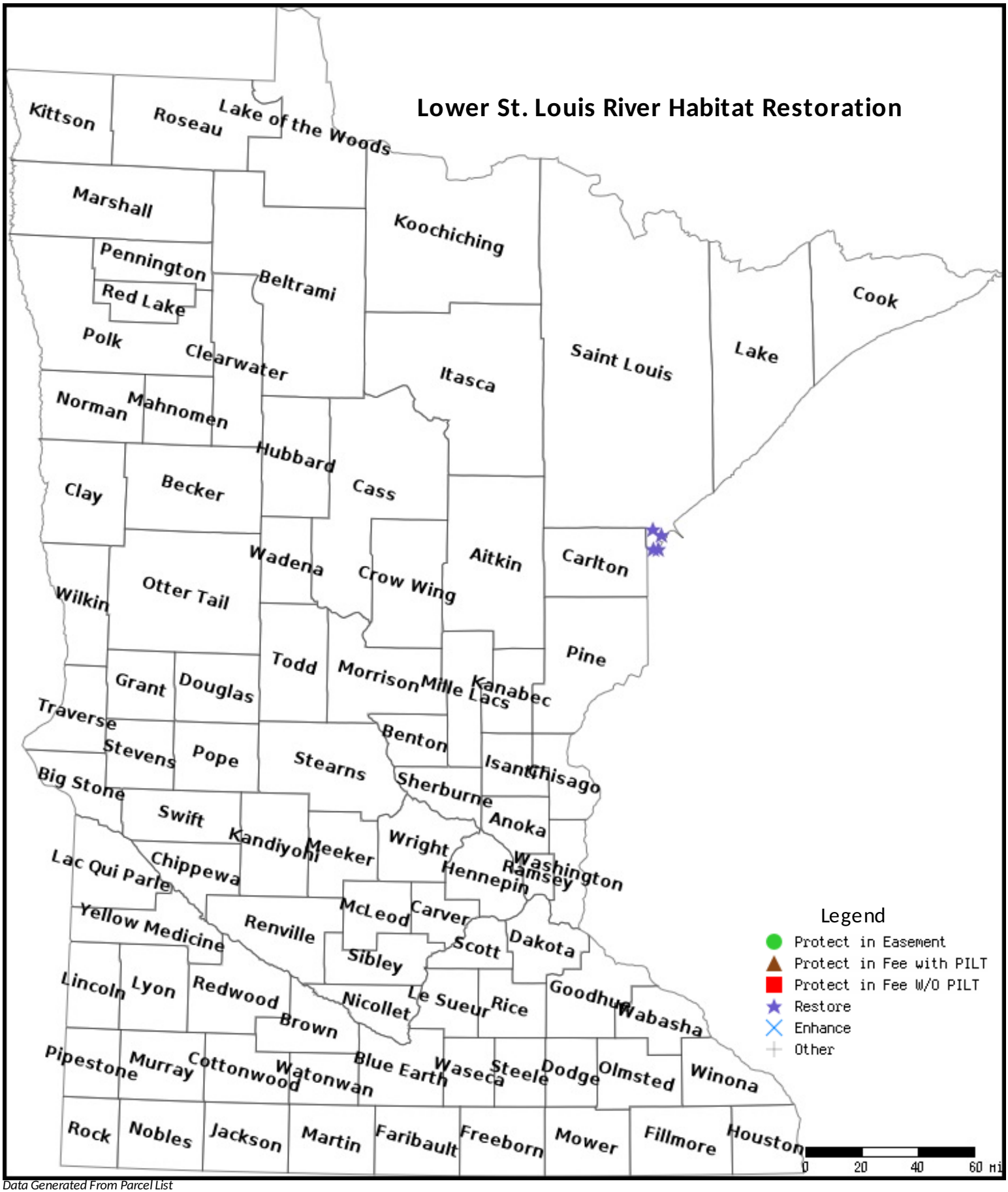
Completed Parcel: Radio Tower Bay

# of Total Acres:	30
County:	St. Louis
Township:	048
Range:	15
Direction:	2
Section:	11
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	
# of Acres: Prairie/Grassland:	
Amount of Shorline:	6000 (Linear Feet)
Name of Adjacent Body of Water (if applicable):	St. Louis River Estuary
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	$2,279,800

Completed Parcel: Rask Bay (Wild Rice)

# of Total Acres:	133
County:	St. Louis
Township:	048
Range:	15
Direction:	2
Section:	09
# of Acres: Wetlands/Upland:	
# of Acres: Forest:	
# of Acres: Prairie/Grassland:	
Amount of Shorline:	
Name of Adjacent Body of Water (if applicable):	
Has there been signage erected at the site:	Yes
Total cost of Restoration/Enhancement:	$67,250

Parcel Map



Data Generated From Parcel List