Lessard-Sams Outdoor Heritage Council

Mud River Enhancement Project

ML 2026 Request for Funding

General Information

Date: 06/26/2025

Proposal Title: Mud River Enhancement Project

Funds Requested: $5,100,000

Confirmed Leverage Funds: $655,000

Is this proposal Scalable?: No

Manager Information

Manager's Name: Tammy Audette
Title: Administrator
Organization: Red Lake Watershed District (RLWD)
Address: 1000 Pennington Avenue South
City: Thief River Falls, MN 56701
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Location Information

County Location(s): Marshall.

Eco regions in which work will take place:

Forest / Prairie Transition

Activity types:

Enhance

Restore

Priority resources addressed by activity:

Habitat

Wetlands

Narrative

Abstract

The Mud River drains thousands of acres of agricultural lands before flowing into the Agassiz National Wildlife Refuge (NWR) just above the confluence with the Thief River. Altered hydrology, flashiness, and incoming sediment from the Mud River watershed has multiple, harmful effects on the NWR.
The project would bring riparian function back to a 6-mile segment of the original channel by restoring natural processes. Floodplain habitat will be enhanced by providing stream access to an additional 700 ac. of wetland during elevated flows. The USFWS, MnDNR and RLWD have cooperatively worked together in developing this project to benefit watershed resources.

Design and Scope of Work

Altered hydrology, flashiness, and incoming sediment from the Mud River watershed has multiple, harmful effects on the NWR. These include wetland bounce, attributed to runoff events during the nesting season which have negative effects on many waterfowl species, loss of meandered riparian habitat for species associated with this habitat type, deterioration of habitat quality as sediment accumulates in wetlands that then become infested with invasive cattail, increased flood impacts as sediment displaces storage volume within the NWR pools, rapid increases in and periodic spikes in turbidity levels in the Thief River when releases of water transfer sediment out of the NWR.

The project was developed using the Flood Damage Reduction Project Work Team approach. This team included Federal, State and Local units of government and both upstream and downstream stakeholders. Alternatives were developed, discussed and consensus reached on the preferred alternative. Project engineering focused on enhancing a six (6) mile segment of an abandoned natural stream. This project will direct at least 80% of the Mud River flow to the enhanced channel, returning it to a functioning state with natural meanders, base flow, low flow channel connected with the floodplain, and a design based on fluvial geomorphic principals. Habitat improvements will include restoring a diverse plant community along the floodplain gradient from emergent wetland vegetation up to forested margins.

The proposed Project consists of a diversion structure at the upstream end, a sinuous excavated two stage channel with low flow channel that conveys a 1 to 2 year design flow and a floodplain bench where needed to convey the 10-year flow. Also included is placement of spoil piles to add topographic variability and provide for increased vegetative diversity. The existing ditches will remain in place with the new channel providing increased flow capacity as compared to existing conditions. The recommended option allows the 10-year event to spread out across the floodplain as compared to being confined to the straightened ditch system. By allowing the flow to spread out there is a decrease in downstream peak flow from 675 cubic feet per second (cfs) to 575 cfs (15% reduction).

Explain how the proposal addresses habitat protection, restoration, and/or enhancement for fish, game & wildlife, including threatened or endangered species conservation

Ditching in the early 1900's straightened the historic flow patterns of this watershed and separated a historic channel from its water source. The result was wetland destruction, increased flow into the water conveyance systems and increased erosion and transportation of sediment downstream.

This project will provide a water feature within the wildlife refuge that meets the purpose for which the refuge was established and, continues to maintain the function of the water conveyance for the watershed and improving wildlife habitat on both a local, state, and national level. By returning natural stream geomorphology to a segment of the Mud River, fish and wildlife species will benefit from the restoration of base flow and by returning a natural sinuous wetland and stream type to the wildlife refuge. The alteration of riparian wetland systems that occurred over 100-years ago, were constructed to facilitate efficient removal of water from the landscape. Straight, linear conveyance systems were, and still remain, an efficient method of draining wetland habitat, effecting many fish and wildlife species. This project is supported by the Thief River One Watershed One Plan and complements other best management practices being implemented in the watershed to improve fish and wildlife habitat, improve water quality and reduce effects of flooding. By restoring meandering wetland characteristics to the landscape, resident populations of reptiles, amphibians and mammals will utilize the newly provided habitat. A wide representation of migratory birds, from wading and shore birds to passerine species up to waterfowl will make use of the diversity of habitat types this project will provide. With North American bird populations having experienced a 30% decrease since 1970, habitat enhancement projects, such as the Mud River Enhancement Project will help address this loss.

What are the elements of this proposal that are critical from a timing perspective?

Private land acquisition has been one of the most challenging tasks in the development of conservation projects. With appropriate funding, this project is ready for final design and implementation as it is located within the Elm Lake WMA and Agassiz NWR, eliminating the need for land acquisition. This project can be a showcase example of the positive impact that wetland and stream restoration can have on building climate resiliency into habitat management. The current RLWD Board of Managers and the MN DNR WMA, and NWR Managers are supportive of the project, and they will bring important community support required to accomplish and maintain the project goals.

Describe how the proposal expands habitat corridors or complexes and/or addresses habitat fragmentation:

By nature, streams and rivers are the original corridors providing travel pathways that connect various habitat types and provide population and species migration on a spatial scale. These interchange/exchanges of wildlife and habitat are what historically sustained strong, healthy populations of plants and animals in Minnesota. The linear habitat that replaced our natural stream and river corridors in the early 1900's due to ditching forever disrupted and fragmented this historic natural system. This project will restore a six-mile segment of the historic Mud River corridor, providing meandered habitat that eliminates the long sight lines of traditional man-made ditches that adds to disturbance and predation.

Meandering waterways provide the intimate and secretive setting that is critical to wildlife during the breeding and nesting seasons. This project will restore a natural corridor and the function of how wildlife historically utilized it.

Which top 2 Conservation Plans referenced in MS97A.056, subd. 3a are most applicable to this project?

North American Waterfowl Management Plan

U.S. Fish and Wildlife Service Strategic Habitat Conservation Model

Explain how this proposal will uniquely address habitat resilience to climate change and its anticipated effects on game, fish & wildlife species utilizing the protected or restored/enhanced habitat this proposal targets.

The Thief River Watershed has seen annual precipitation increase 2" from historic average and is projected to increase 5% by mid-century with rain events becoming more intense and irregular. In a landscape highly modified by ditching, water is the biggest stressor on wildlife habitat. Climate will compound these stressors making it essential to integrate climate science modeling to sustain healthy wildlife populations. This project will address sediment deposition in wetlands and water level fluctuation effects on over-water nesting birds, both significant climate related stressors. High flows, created by intense rain events carry more sediment, and move unnaturally fast down the ditches. This project will provide for natural sediment deposition in the floodplain by restoring access to 700 additional acres of floodplain habitat. Restoring meandered flow patterns and providing floodwater access to a floodplain both slow down water and attenuate wetland pool rise by 100 ac-ft, which benefit over-water nesting birds.

Which LSOHC section priorities are addressed in this proposal?

Forest / Prairie Transition

Protect, restore, and enhance habitat for waterfowl, upland birds, and species of greatest conservation need

Describe how this project/program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife, and if not permanent outcomes, why it is important to undertake at this time:

The primary purpose of the Agassiz NWR is to provide a refuge and breeding ground for migratory birds and other wildlife. This project is designed to provide a wetland feature type that is lacking in NW Minnesota for the benefit of the wildlife that use the landscape. The project incorporates climate modeling to reduce the stressors that are attributed to the extensive ditching in the watershed. The Project will be designed to reduce these harmful effects within and around the Agassiz NWR, while maintaining or improving the Mud River's outlet capacity from upstream agricultural areas through the NWR and into the Thief River.

This project will implement a passive wetland system where a more natural nutrient exchange exists between the floodplain and the meandered channel, and increases hydrological connectivity between the channel and floodplain, thus, restoring the wetland function to be self-adapting to dry and wet periods.

Outcomes

Programs in forest-prairie transition region:

Increased waterfowl and upland bird migratory and breeding success ~ *Meandering waterways provide the intimate and secretive setting that is critical to wildlife during the breeding and nesting seasons. This project will restore a natural corridor and the function of how wildlife historically utilized it. By restoring 6 miles of riparian habitat several species of birds and mammals will once again be able to use this historic corridor. Water quality and quantity monitoring will be conducted to determine project benefits. Wildlife and vegetation response will be monitored by both the USWFS and the MnDNR.*

What other dedicated funds may collaborate with or contribute to this proposal?

Clean Water Fund

Environment and Natural Resource Trust Fund

Per MS 97A.056, Subd. 24, Please explain 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.

Not applicable.

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

This project is located entirely on State WMA and Federal Refuge lands. The MnDNR and USFWS will maintain these habitats to provide for the purposes for which these lands were acquired.

Provide an assessment of how your program may celebrate cultural diversity or reach diverse communities in Minnesota, including reaching low- and moderate-income households:

The Project will provide: Free public access hunting near a population center (cities of Thief River Falls, Grygla, Gatzke, Middle River) No-cost access to wildlife viewing. Outreach to tribal authorities on natural resource benefits is on-going.
Project Partners plan additional education outreach on the cultural significance and history of the area.

Activity Details

Requirements

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 or on lands to be acquired in this program?
Yes

Where does the activity take place?

Refuge Lands

WMA

Land Use

Will there be planting of any crop on OHF land purchased or restored in this program, either by the proposer or the end owner of the property, outside of the initial restoration of the land?
No

Will insecticides or fungicides (including neonicotinoid and fungicide treated seed) be used within any activities of this proposal either in the process of restoration or use as food plots?
No

Other OHF Appropriation Awards

Have you received OHF dollars through LSOHC in the past?
Yes

Are any of these past appropriations still OPEN?
-

Timeline

Activity Name	Estimated Completion Date
Planning, design and permitting	July 1, 2027
Construction	July 1, 2029

Budget

Totals

Item	Funding Request	Total Leverage	Leverage Source	Total
Personnel	-	$155,000	RLWD, USFWS, MnDNR	$155,000
Contracts	$4,800,000	$500,000	RLWD	$5,300,000
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	-	-	-	-
Professional Services	$300,000	-	-	$300,000
Direct Support Services	-	-	-	-
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	-	-	-	-
Supplies/Materials	-	-	-	-
DNR IDP	-	-	-	-
Grand Total	**$5,100,000**	**$655,000**	**-**	**$5,755,000**

Personnel

Position	Annual FTE	Years Working	Funding Request	Total Leverage	Leverage Source	Total
Wildlife Manager	0.1	3.0	-	$35,000	MnDNR	$35,000
Refuge Manager	0.1	3.0	-	$40,000	USFWS	$40,000
Technician	0.2	3.0	-	$50,000	RLWD	$50,000
Administrator	0.1	3.0	-	$30,000	RLWD	$30,000

Amount of Request: $5,100,000
Amount of Leverage: $655,000
Leverage as a percent of the Request: 12.84%
DSS + Personnel: -
As a % of the total request: 0.0%
Easement Stewardship: -
As a % of the Easement Acquisition: -

Total Leverage (from above)	Amount Confirmed	% of Total Leverage	Amount Anticipated	% of Total Leverage
$655,000	$655,000	100.0%	-	0.0%

Detail leverage sources and confirmation of funds:
RLWD, USFWS, and MnDNR are partners in the project and are committed to completion of construction.

Does this proposal have the ability to be scalable?
No

Please explain why this project can NOT be scaled:
Given that the project is a stream restoration, it would be difficult to construct only a portion for the project to function in any meaningful way. The project needs a completed inlet and outlet in order to achieve project goals and objectives.

Contracts

What is included in the contracts line?
Contracts would be for construction of the project.

Professional Services

What is included in the Professional Services line?

Design/Engineering

Federal Funds

Do you anticipate federal funds as a match for this program?
No

Output Tables

Acres by Resource Type (Table 1)

Type	Wetland	Prairie	Forest	Habitat	Total Acres
Restore	44	0	0	-	44
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	700	0	0	-	700
Total	**744**	**0**	**0**	**0**	**744**

Restoration/Enhancement Acres Breakdown of Existing Protected Lands (Table 1a.2)

	RESTORE		ENHANCE	
	Lands acquired with OHF	Lands NOT acquired with OHF	Lands acquired with OHF	Lands NOT acquired with OHF
DNR Lands (WMA, State Forests, etc)	-	13	-	-
Non-DNR Lands (city, state, federal, etc.)	-	31	-	700
Easements	-	-	-	-
Total	**-**	**44**	**-**	**700**

Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	$4,000,000	-	-	-	$4,000,000
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	$1,100,000	-	-	-	$1,100,000
Total	**$5,100,000**	**-**	**-**	**-**	**$5,100,000**

Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
Restore	0	44	0	0	0	44
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	700	0	0	0	700
Total	**0**	**744**	**0**	**0**	**0**	**744**

Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	$4,000,000	-	-	-	$4,000,000
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	$1,100,000	-	-	-	$1,100,000
Total	**-**	**$5,100,000**	**-**	**-**	**-**	**$5,100,000**

Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	$90,909	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-
Protect in Easement	-	-	-	-
Enhance	$1,571	-	-	-

Average Cost per Acre by Ecological Section (Table 6)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest
Restore	-	$90,909	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	$1,571	-	-	-

Target Lake/Stream/River Feet or Miles

6 miles

Parcels

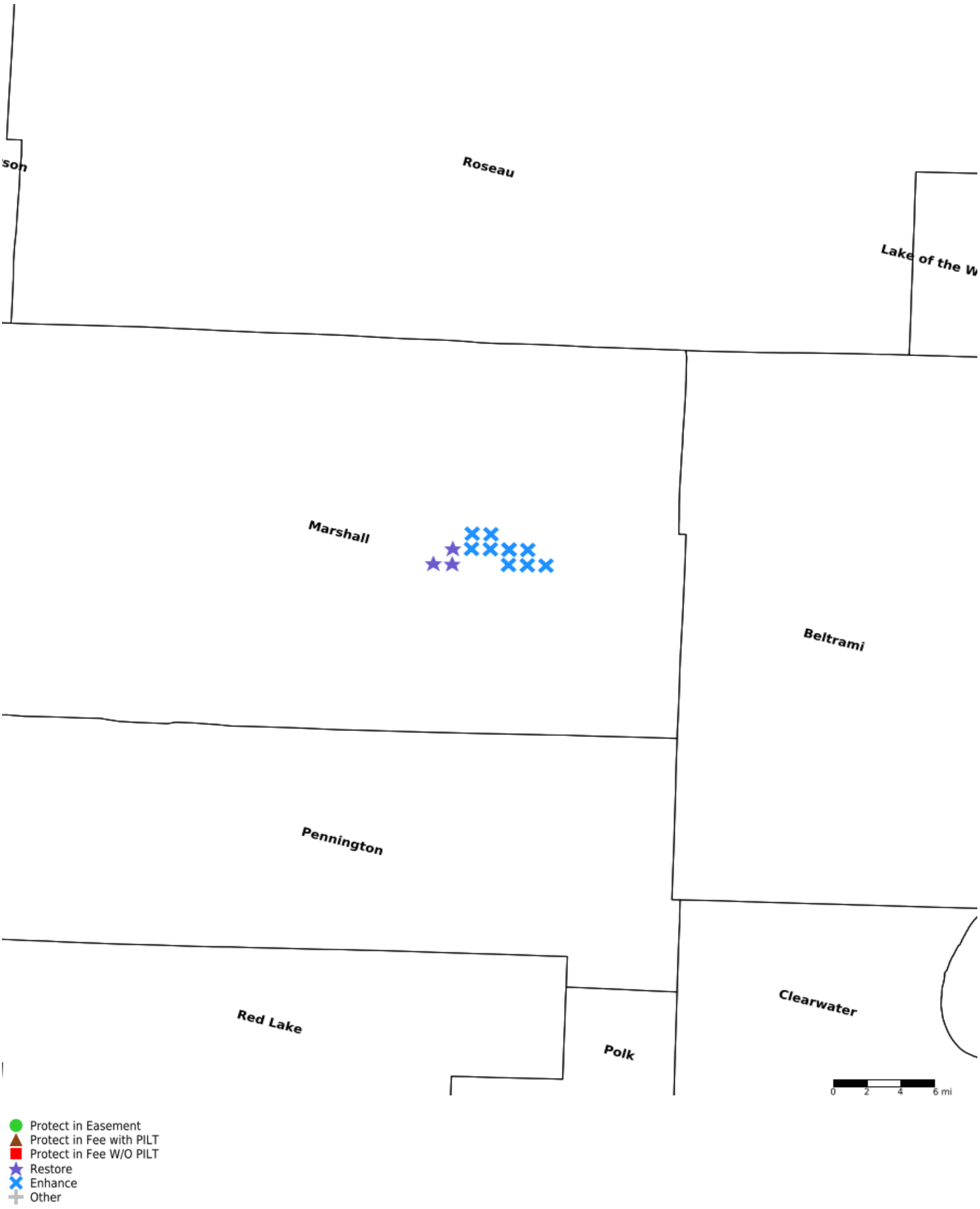
Sign-up Criteria?
No

Explain the process used to identify, prioritize, and select the parcels on your list:
Project site is currently owned by federal and state agencies.

Restore / Enhance Parcels

Name	County	TRDS	Acres	Est Cost	Existing Protection	Description
14-4017-001	Marshall	1564005	480	-	Yes	AGASSIZ NATL WILDLIFE REFUGE
14-4018-001	Marshall	1564006	599	-	Yes	AGASSIZ NATL WILDLIFE REFUGE
14-4018-002	Marshall	1564007	636	-	Yes	AGASSIZ NATL WILDLIFE REFUGE
14-4018-003	Marshall	1564008	640	-	Yes	AGASSIZ NATL WILDLIFE REFUGE
14-4018-007	Marshall	1564009	320	-	Yes	UNITED STATES OF AMERICA
14-6018-004	Marshall	1564009	320	-	Yes	DNR REAL ESTATE MANAGEMENT
14-6018-005	Marshall	1564010	240	-	Yes	DNR REAL ESTATE MANAGEMENT
14-6039-001	Marshall	1564014	160	-	Yes	DNR REAL ESTATE MANAGEMENT
14-6042-002	Marshall	1564015	560	-	Yes	DNR REAL ESTATE MANAGEMENT
14-6042-003	Marshall	1564016	640	-	Yes	DNR REAL ESTATE MANAGEMENT
60-0001-00	Marshall	1564112	640	-	Yes	MUD LAKE NATL WILDLIFE REFUGE
60-0001-00	Marshall	1564113	640	-	Yes	MUD LAKE NATL WILDLIFE REFUGE
60-0001-00	Marshall	1564114	640	-	Yes	MUD LAKE NATL WILDLIFE REFUGE

Parcel Map


son
Roseau
Lake of the W
Marshall
Beltrami
Pennington
Red Lake
Polk
Clearwater
0
2
4
6 mi
Protect in Easement
Protect in Fee with PILT
Protect in Fee W/O PILT
Restore
Enhance
Other

Mud River Enhancement Project