Lessard-Sams Outdoor Heritage Council
Fiscal Year 2022 / ML 2021 Request for Funding

Date: June 22, 2020

Program or Project Title: Targeted Culvert Replacement to Enhance Fish Passage (HRE09)

Funds Requested: $2,720,000

Manager's Name: Jamison Wendel
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County Locations: Lake

Eco regions in which work will take place:

- Northern Forest

Activity types:

- Enhance

Priority resources addressed by activity:

- Habitat

Abstract:

Undersized or improperly designed culverts often create barriers to critical cold water habitat needed to sustain robust Brook Trout populations along Minnesota's North Shore of Lake Superior streams in a changing climate. Protecting and restoring connectivity to the highest quality remaining habitat for Brook Trout is critical to continue populations into the future and is a cost effective strategy to increase resiliency to a changing climate. This programmatic request will work with a large, diverse group of partners to restore fish passage at 20 culverts identified as high priorities in the Manitou and Baptism River watersheds along Minnesota's North Shore.

Design and scope of work:

Culverts are ubiquitous features across all landscapes of Minnesota. Undersized or improperly designed culverts often create barriers to diverse habitat needed to support robust fish populations. Cold water fish populations, such as Brook Trout along North Shore streams, are particularly sensitive to the impacts of culverts that block natural migrations.

Many streams and rivers along the North Shore in Minnesota support robust populations of wild Brook Trout as well as other fish and aquatic species that rely on these unique cold water resources. However, Brook Trout are particularly sensitive to current and predicted increases in stream temperatures and stream flow with a changing climate. Barriers to aquatic organism passage are particularly damaging to Brook Trout because they block access to cold headwater stream refugia during summer and block movement among habitats required at different life stages. Climate models predict available Brook Trout habitat will decrease by 34% along the southern half of the North Shore (Duluth to Silver Bay) by the year 2060. Protecting and restoring the highest quality remaining habitat for Brook Trout is critical to continue sustaining robust populations into the future and is a cost effective strategy to increase the likelihood that North Shore streams continue to support robust Brook Trout populations. Removing barriers also will allow fish and other aquatic animals to access diverse habitats that are critical for them to meet their needs at different life stages.

MNDNR and project partners propose to replace 20 culverts in the Manitou and Baptism River watersheds identified as high priorities to improve fish passage. Replacing these culverts would restore fish passage to 27.5 stream miles.

Prioritization occurred in two phases. First, watersheds were prioritized as priority refugia watersheds. After watersheds were

prioritized, we identified the important values for individual potential culvert projects. The values included factors such as suitable water temperature for fish, amount of stream channel that will become accessible to trout by replacing a culvert, and what the stream temperature is predicted to be in the future. We gave those values scores and used the total score of individual culvert projects to prioritize culvert replacement within the watersheds.

Replacing these 20 culverts will provide many additional benefits beyond the immediate improvements to fish passage. These projects will allow streams to respond more naturally to rain and snowmelt events, while reducing the amount of sediment the streams transport. Culvert replacements will also allow more water to flow under roads after rain and snowmelt and decrease the risk of catastrophic road failure that jeopardizes public safety and causes costly infrastructure repairs.

The projects on our list currently have strong local support. A diverse group of local, state, federal, and non-profit partners are actively involved in this project and are critical to its success. Lake County Soil and Water Conservation District, US Forest Service, Lake County Forestry, North Shore Collaborative, Wolf Ridge Environmental Center, Trout Unlimited, Arrowhead Fly Fishers, MPCA, The Nature Conservancy, Lake County Highway Department, Crystal Bay Township,and MnDOT have all helped develop this initiative.

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:

There are 68 species of greatest conservation need that utilize headwaters to large streams, including birds, turtles, frogs, fish, and insects. Stream habitat projects are not designed with one species in mind, but instead are intended to benefit multiple functions and habitats of the river both within the stream and in the riparian area, which will have benefits for many of these rare species.

The Manitou River watershed is a Conservation Focus Area in the Minnesota Wildlife Action Plan 2015-2025. As stated in the plan, "Conservation Focus Areas (CFA) are priority areas for working with partners to identify, design, and implement actions and to report on the effectiveness toward achieving the goals and objectives defined in the Wildlife Action Plan. Conservation Focus Areas are intended to focus conservation efforts over the next 10 years to maintain and enhance the resiliency of the Wildlife Action Network."

The Minnesota Wildlife Action Plan 2015-2025 also addresses the vulnerability of coldwater aquatic systems to climate change: "Warming air temperatures, reduction in groundwater inputs (as a result of higher air temperatures and evaporation), altered and more extreme precipitation patterns, increased impervious surface, agricultural drainage, and human demands on groundwater are expected to reduce the amount of available habitat for cold-water stream species such as brook trout." Restoring connectivity at the 20 road crossings included in this proposal will help ensure North Shore streams retain high quality coldwater aquatic systems for future generations.

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

The projects on our list have strong local support that may not be present in the future if public sentiment were given time to change. A diverse group of local, state, federal, and non-profit partners are actively involved in this project and are critical to its success. Lake County Soil and Water Conservation District, US Forest Service, Lake County Forestry, North Shore Collaborative, Trout Unlimited, Arrowhead Fly Fishers, Minnesota PCA, Sugar Loaf Nature Center, The Nature Conservancy, Wolf Ridge Environmental Learning Center, Lake County Highway Department, and Minnesota DOT have all been involved in developing this initiative.

Many older culverts that were designed for previous stream flows are now failing and becoming fish barriers due to recent increases in high precipitation events. Replacing undersized culverts decreases the risk of catastrophic road failure that jeopardizes public safety and results in costly emergency infrastructure repairs.

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:

Our proposal features projects intended to reduce fragmentation. Undersized and poorly designed culverts in rivers fragment areas of suitable habitat. By removing or modifying barriers in streams, we will allow fish and other aquatic life to move between different patches of habitat that may be critical for different life cycle activities, such as spawning. Connectivity protects fish populations from extreme events by allowing them movement within the watershed and allows them to recover after those events. Allowing fish access to as much of a watershed as possible also allows for expansion of fishing opportunities by acting as a conduit for recolonization should something catastrophic such as drought happen in one portion of a watershed. Modifying the 20 culverts identified as high priorities in the Manitou and Baptism River watersheds will restore connectivity to 27.5 miles of diverse, cold water stream habitat.

Prioritization occurred in two phases. First, high priority watersheds were identified based on coldwater habitat and ability to sustain Brook Trout populations into the future. These watersheds were also identified as high priority watersheds by partners such as The Nature Conservancy, US Fish and Wildlife Service, Minnesota Pollution Control Agency, and Coldwater Coalition. Additionally, the

Manitou River watershed is a Conservation Focus Area in the current Wildlife Action Plan.

After watersheds were prioritized, we identified the important values for individual potential culvert projects. The values included things including suitable water temperature for fish, amount of stream channel that will become accessible to trout by replacing a culvert, and what was temperature is predicted to be in the future. We gave those values scores and used the total score of individual culvert projects to prioritize culvert replacement within the watersheds. Prioritization and implementation will be completed in the following steps:

1 – Prioritize Watershed (by refugia and resiliency)
2 – Use characteristics of the streams and the watershed to prioritize projects
3 – Ground truth
4 – Develop partnerships and obtain funding
5 – Pre-project monitoring
6 – Replace culverts
7 – Post-project monitoring

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

- H5 Restore land, wetlands and wetland-associated watersheds
- H6 Protect and restore critical in-water habitat of lakes and streams

Which other plans are addressed in this proposal:

- Minnesota DNR Strategic Conservation Agenda
- National Fish Habitat Action Plan

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

This project aligns with numerous federal, state and local government plans as well as private conservation organization's plans that target improving trout habitat, Brook Trout populations, resiliency against climate change, stream connectivity and water quality in the Lake Superior Basin.

For example, from the National Fish Habitat Action Plan:

1. Protect and maintain intact and healthy aquatic systems.
2. Reverse declines in the quality and quantity of aquatic habitats to improve the overall health of fish and other aquatic organisms.
3. Increase the quality and quantity of fish habitats that support a broad natural diversity of fish and other aquatic species.

The DNR's Strategic Conservation Agenda includes strategies to identify priority land and waters at greatest risk, and manage lands and waters for ecosystem health and resilience. Our proposal will address each of these initiatives through our prioritization of projects, and the management actions we will take.

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:

Brook Trout are significant to the aquatic ecosystems of this region as the only native stream-dwelling salmonid and a symbol of healthy watersheds. Despite the region's abundance of public land and sparse development, the ecological functions of streams are diminished by historic and present land use practices that degrade the aquatic ecosystem, most notably impacting Brook Trout and other sensitive and rare species. Restoring fish passage will provide the aquatic habitat required to support excellent cold water fish populations and benefit other aquatic organisms.

Climate change requires action to protect, restore, and reconnect the highest quality remaining habitats to support this vulnerable species. The effects of warming temperatures are compounded by the region's location along the southern extent of the boreal forest.

Climate change is anticipated to result in a loss of key boreal forest, a disruption to forest composition and a loss of valuable riparian shading. Also, temperature increases will be greater in northern latitudes aligned with the Lake Superior Basin and most stressful to sensitive coldwater species. Removing barriers in the cold headwater tributaries of these watersheds will provide the refugia to ensure the continuation of Brook Trout during these transitions.

Relationship to other funds:

- Not Listed

Describe the relationship of the funds:

Not Listed

Does this program include leverage in funds:

Yes

Crystal Bay township has committed $50,000 for culvert replacements completed within that township. Lake County SWCD has committed $12,500 for staff time related to culvert replacements.

Similar projects have been very successful in securing federal grants. For example, last year Lake County SWCD was awarded a $400,000 Sustain Our Great Lakes grant to use towards two culvert replacements identified as high priorities for fish passage on Hockamin Creek. We will continue to aggressively pursue additional grants for this proposal.

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:

This request is an acceleration of DNR aquatic habitat work to a level not attainable but for the appropriation.

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

Appropriation Year	Source	Amount
2016	Lake Superior Coastal Program Grant	20,000
2016	BWSR Grant	77,000
2018	Game and Fish Funds	6,400

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

Culvert upgrades have a life expectancy of 50 years with routine maintenance. Operation and maintenance agreements will be established that highlight necessary and routine maintenance activities. Project inspections will be conducted at years 1, 3, 9 after completion of the project.

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

Year	Source of Funds	Step 1	Step 2	Step 3
2025	Game and Fish	Inspect culverts	Inspect riparian vegetation	Make adjustments as needed
2027	Game and Fish	Inspect culverts	Inspect riparian vegetation	Make adjustments as needed
2033	Game and Fish	Inspect culverts	Inspect riparian vegetation	Make adjustments as needed

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

Project success is expected to show movement of Brook Trout between previously isolated reaches and an increase in spawning intensity and distribution in these two watersheds. Connectivity to tributary streams also counteracts local extinctions due to the valuable spawning habitat and the genetic exchange that occurs there. The estimated abundances below provide general averages for potential aquatic indicator species in Minnesota. These averages are generated from available data and published sources, and do not capture the variability inherent in populations of fish and mussels. Natural populations, including healthy populations with good habitat, vary among locations, and also rise and fall within lakes and rivers. Most fish surveys conducted by DNR produce an index of

abundance (catch per unit effort) rather than a population estimate. For streams included in this proposal, we expect to raise Brook Trout abundance to 40 lbs/acre.

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 (County/Municipal, Public Waters)**

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

Land Use:

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

Land Use:

Have you received OHF dollars in the past through LSOHC? - **No**

Accomplishment Timeline

Activity	Approximate Date Completed
Design Culvert Modification Projects	March 2022
Permitting and Environmental Review of Culvert Modificiation Projects	December 2022
Construction of Culvert Modification Projects	September 2024

Budget Spreadsheet

Total Amount of Request: $2,720,000

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	$0	$0		$0
Contracts	$2,720,000	$62,500	Crystal Bay Township, Lake County SWCD	$2,782,500
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	$0	$0		$0
Professional Services	$0	$0		$0
Direct Support Services	$0	$0		$0
DNR Land Acquisition Costs	$0	$0		$0
Capital Equipment	$0	$0		$0
Other Equipment/Tools	$0	$0		$0
Supplies/Materials	$0	$0		$0
DNR IDP	$0	$0		$0
Total	$2,720,000	$62,500	-	$2,782,500

Amount of Request:	$2,720,000
Amount of Leverage:	$62,500
Leverage as a percent of the Request:	2.30%
DSS + Personnel:	$0
As a % of the total request:	0.00%
Easement Stewardship:	$0
As a % of the Easement Acquisition:	-%

What is included in the contracts line?

100% of contracts are for enhancement work.

Describe and explain leverage source and confirmation of funds:

Crystal Bay township and Lake County SWCD have committed $62,500 in staff and equipment time for culvert replacements completed within that township.

Similar projects have been very successful in securing federal match and we will continue to aggressively pursue additional grants for this proposal.

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:

Projects come from a prioritized list. If we do not receive our full request, we would fund only the top projects from our list that fit within the amount allocated. Outputs would be impacted, corresponding to the output of dropped projects.

Output Tables

Table 1a. Acres by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	0	0	0	0	0
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	20	20
Total	0	0	0	20	20

Table 2. Total Requested Funding by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	$0	$0	$0	$0	$0
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	$2,720,000	$2,720,000
Total	$0	$0	$0	$2,720,000	$2,720,000

Table 3. Acres within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	0	0	0	0	0	0
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	20	20
Total	0	0	0	0	20	20

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	$0	$0
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	$2,720,000	$2,720,000
Total	$0	$0	$0	$0	$2,720,000	$2,720,000

Table 5. Average Cost per Acre by Resource Type

Type	Wetlands	Prairies	Forest	Habitats
Restore	$0	$0	$0	$0
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	$136,000

Table 6. Average Cost per Acre by Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	$0	$0	$0	$0	$0
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	$136,000

Automatic system calculation / not entered by managers

Target Lake/Stream/River Feet or Miles

1.7

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.

Outcomes

Programs in the northern forest region:

- Improved aquatic habitat indicators *We will use routine fish surveys to gauge changes to the fish community and compare to pre-project data.*

Parcel List

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

Not Listed

Section 1 - Restore / Enhance Parcel List

Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
County Highway 8 #1	05806209	1	$26,600	Yes
County Highway 8 #2	05806210	1	$19,300	Yes
Cramer Road #1	05906233	1	$38,700	Yes
Cramer Road #2	05806204	1	$357,900	Yes
Cramer Road #3	05906227	1	$48,400	Yes
Cramer Road #4	05806209	1	$26,600	Yes
Cramer Road #5	05806220	1	$48,400	Yes
Cramer Road #6	05806217	1	$203,100	Yes
Cranberry Road	05707227	1	$135,600	Yes
East General Grade Road #1	05907221	1	$232,100	Yes
East General Grade Road #2	05907230	1	$140,300	Yes
East General Grade Road #3	05907216	1	$31,400	Yes
Forest Road 172D	05907218	1	$396,600	Yes
Forest Road 359	05907222	1	$43,500	Yes
Hoist Lake Road	05907214	1	$203,100	Yes
Little Marais Road #1-3	05707224	3	$406,800	Yes
Little Marais Road #4	05707222	1	$135,600	Yes
Wanless Road	05908201	1	$217,600	Yes

Section 2 - Protect Parcel List

No parcels with an activity type protect.

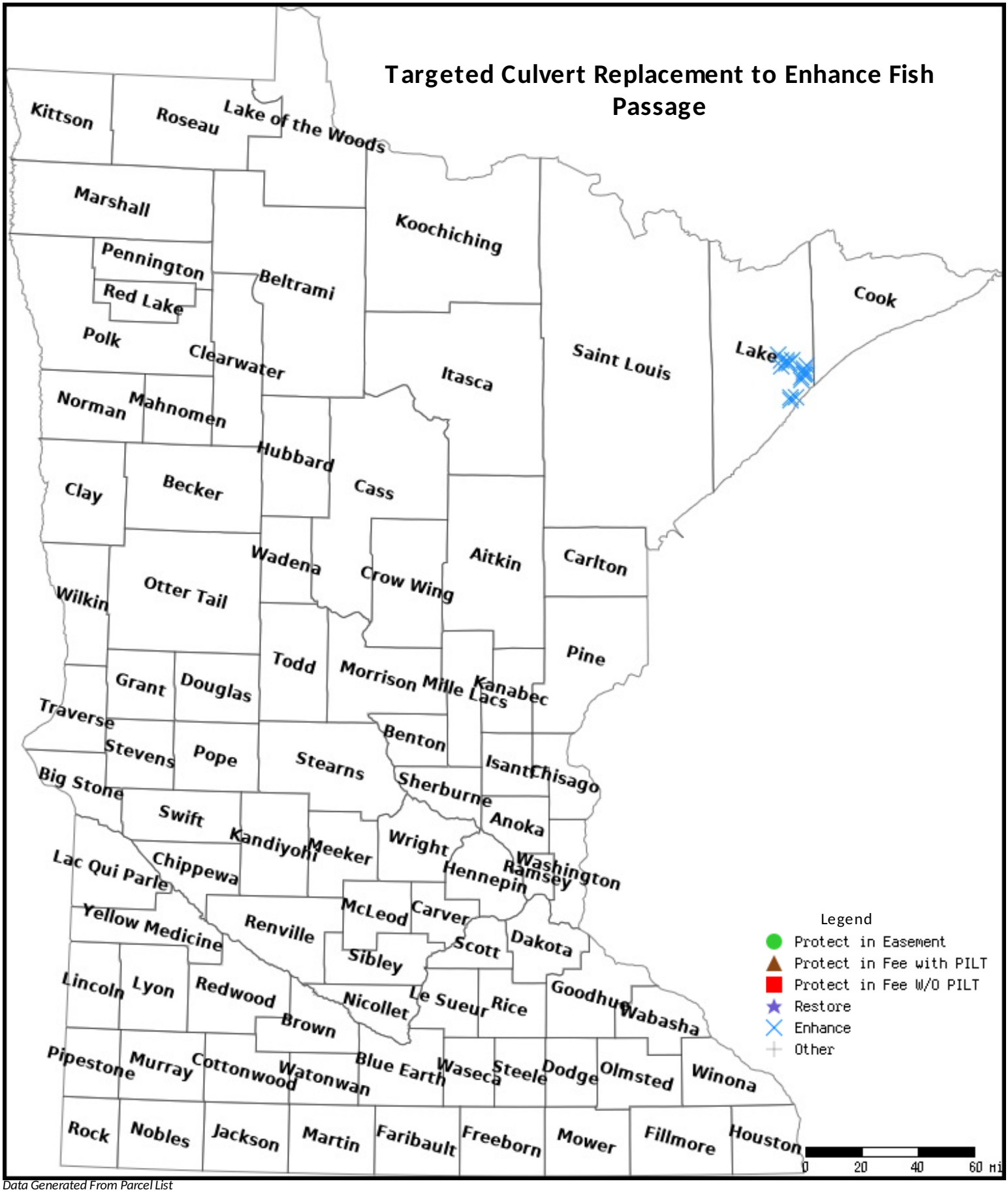
Section 2a - Protect Parcel with Bldgs

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

Targeted Culvert Replacement to Enhance Fish Passage

Jamison Wendel| Stream Habitat Supervisor

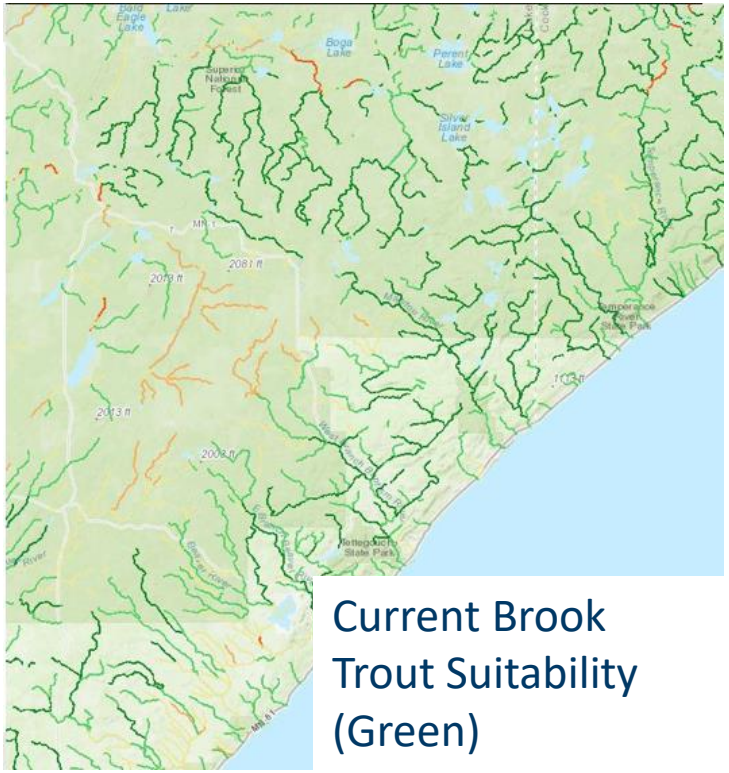
Total Request: $2,720,000

DEPARTMENT OF NATURAL RESOURCES

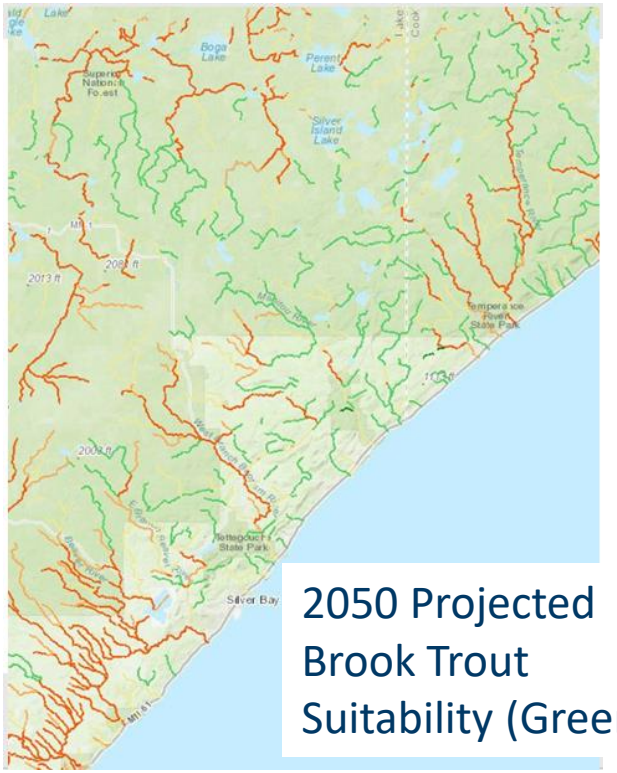
CLEAN WATER LAND & LEGACY AMENDMENT

Proposal Highlights

- Diverse Group of Federal, State, Local, and Non-profit Partners
- Modify 20 culverts to restore fish passage in two high priority watersheds
- Access to cold water in tributary streams is critical to sustaining Brook Trout populations on North Shore streams
- Watersheds were prioritized based on coldwater refugia and resiliency
- Culverts within high priority watersheds were assessed and assigned weighted scores.



Current Brook Trout Suitability (Green)



2050 Projected Brook Trout Suitability (Green)

Before Modification

After Modification