Lessard-Sams Outdoor Heritage Council

ML 2022 Request for Funding

General Information

Date: 06/04/2021

Proposal Title: DNR Fish Passage Enhancement through Targeted Culvert Replacement - Phase 1

Funds Requested: $1,605,300

Manager Information

Manager's Name: Jamison Wendel
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Location Information

County Location(s): Lake.

Eco regions in which work will take place:

- Northern Forest

Activity types:

- Enhance

Priority resources addressed by activity:

- Habitat

Narrative

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 16 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 16 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 16 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 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 Forest 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 16 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 Forest 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. Replacing the 16 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 two sections of the Minnesota Statewide Conservation and Preservation Plan are most 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 two 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.

What other fund may contribute to this proposal?

- N/A

Does this proposal include leveraged funding?

Yes

Explain the leverage:

Crystal Bay township has committed $10,000 for culvert replacements completed within that township. Lake County SWCD has committed $12,500 for staff time related to culvert replacements.

Federal grants contributing to this project include $201,000 from a National Fish Passage grant, $46,000 from a Great Lakes Restoration Initiative grant, and $230,000 from EPA.

Similar projects have been very successful in securing additional federal grants. For example, in 2019, 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, 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.

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

Non-OHF Appropriations

Year	Source	Amount
2016	Lake Superior Coastal Program Grant	20,000
2018	Game and Fish Funds	6,400
2017	BWSR Grant	77,000

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.

Actions 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.

How will the program directly involve, engage, and benefit BIPOC (Black, Indigenous, People of Color) and diverse communities:

The DNR Fish Passage Enhancement through Targeted Culvert Replacement proposal has the following specific ties to BIPOC and diverse communities. Projects included in this proposal provide benefits at the watershed scale. These benefits extend well beyond the footprint of each individual project and benefit all Minnesotans. For this program, we have engaged and received positive feedback from tribal representatives from the 1854 treaty authority (Grand Portage, Fond du Lac, Great Lakes Indian Fish and Wildlife Commission, and Red Cliff).

DNR's OHF projects aim to serve all Minnesotans. At the same time, we are bringing more focus in all our work to

BIPOC and diverse communities. The Minnesota DNR has adopted advancing diversity, equity and inclusion (DEI) as a key priority in its 2020-22 strategic plan. The plan focuses on increasing the cultural competence of our staff, creating a workforce that is reflective of Minnesota, continuing to strengthen tribal consultation and building partnerships with diverse communities.

The OHF funds high quality habitat projects that provide ecosystem services like clean water and carbon sequestration that support environmental justice. OHF also supports public access and recreational opportunities on these lands. OHF projects and outcomes benefit BIPOC and diverse communities through recreational opportunities that are close-to-home, culturally responsive and accessible to Minnesotans with disabilities.

The DNR has diversity, equity and inclusion strategies that benefit all OHF projects:

- Multilingual and culturally specific hunting and fishing education programs take place on public lands.
- All hiring is equal opportunity, affirmative action, and veteran-friendly. Contracting seeks out Targeted Group, Economically Disadvantaged and Veteran-Owned businesses.
- Public engagement seeks out BIPOC voices and involves diverse communities. Outreach and marketing of projects has this focus as well.
- Partnerships are at the center of all projects. Tribes in particular are consulted in all pertinent areas of the DNR's work, under EO 19-24.

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

Where does the activity take place?

- County/Municipal
- Public Waters

Land Use

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

Other OHF Appropriation Awards

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

Timeline

Activity Name	Estimated Completion Date
Design Culvert Modification Projects	March 2023

Permitting and Environmental Review of Culvert Modificiation Projects	December 2023
Construction of Culvert Modification Projects	September 2025

Budget

Totals

Item	Funding Request	Antic. Leverage	Leverage Source	Total
Personnel	-	-	-	-
Contracts	$1,605,300	$499,500	Crystal Bay Township, Lake County SWCD, National Fish Passage, Great Lakes Restoration Initiative, EPA	$2,104,800
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	-	-	-	-
Professional Services	-	-	-	-
Direct Support Services	-	-	-	-
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	-	-	-	-
Supplies/Materials	-	-	-	-
DNR IDP	-	-	-	-
Grand Total	**$1,605,300**	**$499,500**	**-**	**$2,104,800**

Amount of Request: $1,605,300
Amount of Leverage: $499,500
Leverage as a percent of the Request: 31.12%
DSS + Personnel: -
As a % of the total request: 0.0%
Easement Stewardship: -
As a % of the Easement Acquisition: -

Describe and explain leverage source and confirmation of funds:
Crystal Bay township has committed $10,000 for culvert replacements completed within that township. Lake County SWCD has committed $12,500 for culvert replacements. A total of $477,000 from various other federal grants have also been confirmed to contribute to the completion of this project.

Does this proposal have the ability to be scalable?
Yes

If the project received 70% of the requested funding

Describe how the scaling would affect acres/activities and if not proportionately reduced, why?
Approximately 11 culverts (69% of original acres) would be replaced at 70% funding. With reduced funding, we would select culverts to replace based off our prioritized list. Some of the higher priority culverts targeted for replacement have above average costs.

Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?
There are no personnel or DSS expenses included in this proposal.

If the project received 50% of the requested funding

Describe how the scaling would affect acres/activities and if not proportionately reduced, why?
Approximately 6 culverts (38% of original acres) would be replaced at 50% funding. With reduced funding, we would select culverts to replace based off our prioritized list. Some of the highest priority culverts targeted for replacement have above average costs.

Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?
There are no personnel or DSS expenses included in this proposal.

Contracts

What is included in the contracts line?
100% of contracts are for enhancement work.

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	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	16	16
Total	**0**	**0**	**0**	**16**	**16**

Total Requested Funding by Resource Type (Table 2)

Type	Wetland	Prairie	Forest	Habitat	Total Funding
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	$1,605,300	$1,605,300
Total	**-**	**-**	**-**	**$1,605,300**	**$1,605,300**

Acres within each Ecological Section (Table 3)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Acres
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	16	16
Total	**0**	**0**	**0**	**0**	**16**	**16**

Total Requested Funding within each Ecological Section (Table 4)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest	Total Funding
Restore	-	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-	-	-
Protect in Easement	-	-	-	-	-	-
Enhance	-	-	-	-	$1,605,300	$1,605,300
Total	**-**	**-**	**-**	**-**	**$1,605,300**	**$1,605,300**

Average Cost per Acre by Resource Type (Table 5)

Type	Wetland	Prairie	Forest	Habitat
Restore	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-
Protect in Fee w/o State PILT Liability	-	-	-	-
Protect in Easement	-	-	-	-
Enhance	-	-	-	$100,331

Average Cost per Acre by Ecological Section (Table 6)

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	N. Forest
Restore	-	-	-	-	-
Protect in Fee with State PILT Liability	-	-	-	-	-
Protect in Fee w/o State	-	-	-	-	-

PILT Liability					
Protect in Easement	-	-	-	-	-
Enhance	-	-	-	-	$100,331

Target Lake/Stream/River Feet or Miles

1.3

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.*

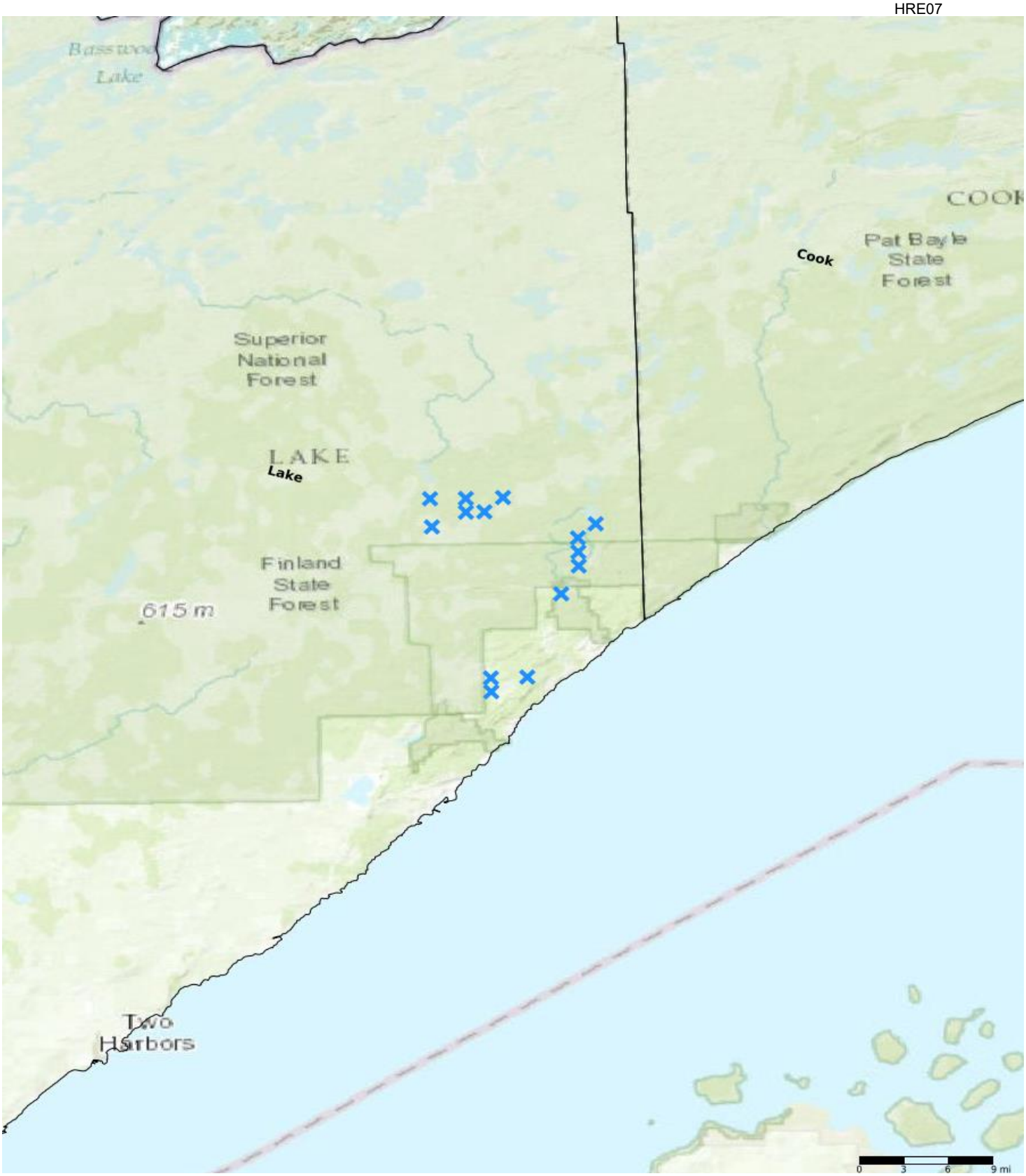
Parcels

Sign-up Criteria?
No

Explain the process used to identify, prioritize, and select the parcels on your list:
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.

Restore / Enhance Parcels

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



Protect in Easement
Protect in Fee with PILT
Protect in Fee W/O PILT
Restore
Enhance
Other

Parcel Map
DNR Fish Passage Enhancement through Targeted Culvert Replacement - Phase 1
(Data Generated From Parcel List)

Fish Passage Enhancement through Targeted Culvert Replacement

Proposal Highlights

- Diverse group of federal, state, local, and non-profit partners.
- Modify 16 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.

Request: $1,605,300
Leverage: $499,500

Questions?

Jamison Wendel, Stream Habitat Supervisor, Minnesota Department of Natural Resources
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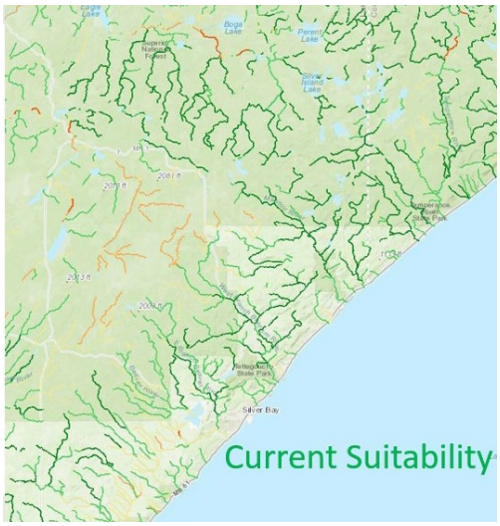
Culvert before modification:

Culvert after modification:

Current brook trout suitability (green):



2050 projected brook trout suitability (green):