Lessard-Sams Outdoor Heritage Council

Southeast & Metro Trout Stream Habitat Enhancement, Phase 2

ML 2023 Request for Funding

General Information

Date: 06/23/2022

Proposal Title: Southeast & Metro Trout Stream Habitat Enhancement, Phase 2

Funds Requested: $2,913,000

Manager Information

Manager's Name: John Lenczewski
Title: Executive Director
Organization: Minnesota Trout Unlimited
Address: P O Box 845
City: Chanhassen, MN 55317
Email: john.lenczewski@mntu.org
Office Number: 6126701629
Mobile Number: 6126701629
Fax Number:
Website: www.mntu.org

Location Information

County Location(s): St. Louis, Houston, Olmsted, Winona, Fillmore, Wabasha, Goodhue, Dakota and Scott.

Eco regions in which work will take place:

- Northern Forest
- Metro / Urban
- Southeast Forest

Activity types:

- Enhance

Priority resources addressed by activity:

- Habitat

Narrative

Abstract

Minnesota Trout Unlimited will enhance and restore degraded habitat for fish and diverse wildlife in and along priority trout streams located on existing public lands and conservation easements in the Metro area and southeast Minnesota. Increasing threats to these highly prized, yet relatively scarce, resources require accelerating habitat work to reduce the backlog of degraded stream reaches and buffer streams from the increased frequency and intensity of large rainfall and flood events. In addition to increased fish and wildlife populations, other outcomes include increased opportunities for anglers and wildlife enthusiasts to interact with high quality ecosystems close to home.

Design and Scope of Work

The popularity of trout fishing in southeast MN and the Metro area continues to soar. Anglers applaud our recent habitat projects but want to see many more undertaken. Badly degraded habitat on those trout streams that are most accessible to the public severely limits their productivity and public enjoyment. Minnesota Trout Unlimited ("MNTU") will directly enhance or restore degraded habitat on priority streams with existing protections under the Aquatic Management Area system or other public ownership. We will also extend the work of the conservation corps, drawn from urban youth, to restore healthy prairie, wetland and forest vegetation (i.e., habitat) on the larger parcels surrounding Metro trout streams. We propose to restore or enhance habitat in and along these public waters (in these counties):

1. Eagle Creek (Scott);
2. Vermillion River (Dakota);
3. Little Cannon River (Goodhue);
4. Spring Creek (Wabasha);
5. South Branch Root River (Fillmore);
6. Crooked Creek (Houston);
7. Garvin Brook (Winona);
8. Southeast MN streams (additional enhancements in numerous counties);
9. Numerous streams (vegetation in numerous counties); and
10. Keene Creek (St. Louis).

Individual project descriptions are provided in an attachment.

Goals and scope of work:
The goals of projects are to increase the carrying capacity and trout population of the stream, increase angling access and participation, improve water quality, and provide other benefits to aquatic, terrestrial, and avian wildlife. Each project will accomplish one or more of these objectives: (a) increase adult trout abundance, (b) reduce stream bank erosion and associated sedimentation downstream, (c) reconnect the stream to its floodplains to reduce negative impacts from severe flooding, (d) increase natural reproduction of trout and other aquatic organisms, (e) increase habitat for invertebrates and non-game species, (f) improve connectivity of habitat along aquatic and riparian (terrestrial) corridors, (g) improve riparian forest health and function, (h) improve angler access and participation, and (i) protect productive trout waters from invasive species. The scope of work and methods utilized vary by project site conditions and are discussed in the individual project descriptions provided in the attachment.

How priorities were set:

MNTU focuses habitat enhancement and restoration efforts on those watersheds likely to continue to support viable, fishable populations of naturally reproducing trout fifty years and more from now. Work is done only where degraded habitat is a limiting factor for a quality, sustainable fishery. Priority locations are determined through consultations with MNDNR professionals, MNDNR management plans and surveys, other habitat and conservation planning efforts, MNTU members' knowledge of watersheds, and science-based criteria. All things being equal, we consider the potential to draw new anglers outdoors, increase public awareness, engage landowners in conservation, foster partnerships, and increase public support for OHF projects.

Stakeholder support:
We continue receiving strong support from anglers, landowners, rural communities, and local civic and sporting organizations. Local governments are approaching us to partner on habitat work and we continue gathering local input and developing partnerships in the planning and implementation stages. Landowners typically become very enthusiastic partners.

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

The projects will restore or enhance degraded habitat for fish and wildlife in and along coldwater streams and rivers which historically supported naturally reproducing trout populations highly valued by generations of anglers. While trout are the apex predator and key indicator species for the health of coldwater ecosystems, a host of rare aquatic and riparian species are uniquely associated with these systems. Well-functioning coldwater aquatic ecosystems are far fewer in number than the 6% of Minnesota's stream and river miles which theoretically can still support trout. Even many streams considered to be the best remaining trout streams have badly degraded segments which disrupt connectivity and significantly impact the productivity and long-term resilience and sustainability of the overall trout population. Streams face growing threats from warming temperatures, increased frequency of severe flooding, and rising demand for groundwater extraction from the aquifers which supply inputs of vitally important cold water. The proposed projects are focused on streams and stream segments which will benefit from improved connectivity and help ensure Minnesota retains at least some high quality coldwater fisheries for future generations. A small portion of an appropriation would be used to maintain or add enhancements to past projects to ensure continuing habitat benefits.

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

Although Minnesota's trout streams are among the highest quality aquatic systems remaining in the state and prized by anglers and the general public because of this, a majority have badly degraded habitat. The impacts of leaving degraded segments untreated extends throughout the stream. Degraded sections are no longer providing habitat, clean water benefits, angling opportunities, or other enticements which increase public appreciation and stewardship of aquatic ecosystems. Even where riparian corridors are protected, past habitat degradation cannot be reversed without active intervention. A warming climate and more frequent heavy rains require action now to increase floodplain connectivity and thereby increase durability of in-stream habitat. The state must continue restoring and enhancing degraded habitat to safeguard and improve the productivity and sustainability of these rare fisheries and aquatic ecosystems for future generations to enjoy. Timely maintenance on older projects will extend habitat function and maximize outcomes well into the future.

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:

In selecting project sites, MNTU reviews MNDNR watershed specific fisheries management plans and other conservation planning efforts, consults with MNDNR professionals, and applies ranking criteria developed by the MNDNR. Projects must have the potential to increase the carrying capacity (fish numbers), the streams have natural reproduction, and the public have access to them. Improving the connectivity of good aquatic and riparian habitat is an important consideration and the projects are selected to expand or connect gaps in these corridors. We are increasingly targeting stream segments which build off earlier habitat or protection work in the same stream or connected watershed.

Which two sections of the Minnesota Statewide Conservation and Preservation Plan are most applicable to this project?

- H3 Improve connectivity and access to recreation

Which two other plans are addressed in this proposal?

- Driftless Area Restoration Effort
- Strategic Plan for Coldwater Resources Management in Southeastern Minnesota

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

Both plans call for increasing the protection, improvement, and restoration of coldwater aquatic habitats and fish communities, by increasing the amount of stream habitat improved and maintained. MNTU's FY2024 projects will directly enhance or restore habitat along more than 10 miles of trout streams and benefit populations and in-stream habitat on a far larger number of miles of trout water.

Which LSOHC section priorities are addressed in this proposal?

Metro / Urban

- Enhance and restore coldwater fisheries systems

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

Southeast Forest

- Protect, enhance, and restore habitat for fish, game, and nongame wildlife in rivers, cold-water streams, and associated upland habitat

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:

We will directly restore or enhance critical habitat for fish, game, and nongame wildlife on key segments of coldwater streams and rivers around the state. The projects will restore or enhance habitat in and along 10 miles of streams and rivers, and connect much larger corridors of habitat, while also extending myriad benefits (including water quality improvements, reduced sedimentation, etc.) far downstream of each project site.

What other fund may contribute to this proposal?

- N/A

Does this proposal include leveraged funding?

Yes

Explain the leverage:

We will leverage private funding of Trout Unlimited, and local members and chapters will donate in-kind labor. Several partners (MNDNR, SWCD offices, etc.) will likely contribute significant amounts of time and/or dollars assisting on several projects. We also hope to leverage substantial federal and other funding, including federal NRCS funding on southeast Minnesota projects.

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.

The request is not supplanting or a substitution for previous funding. The work proposed for funding is for new or additional work.

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

MNTU's coldwater aquatic habitat restoration and enhancement projects are designed for long-term ecological and hydraulic stability. Construction contracts include maintenance/warranty provisions to ensure habitat work is well established. After this period and once riparian vegetation is well established, major maintenance work is not typically required in order to sustain the habitat outcomes for decades. Reconnected floodplains allow flood water to quickly spread out and dissipate energy, reducing the destructive impact of a flood. Flood waters typically flatten streamside vegetation temporarily and do not damage the in-stream structures. The tenfold increase in trout populations and threefold increase in large trout which are common following completion of a southeast Minnesota project, are typically sustainable long-term through natural reproduction.

We anticipate that long-term monitoring of the integrity of the improvements will be done in conjunction with routine inspections and biological monitoring conducted by local MNDNR staff, MNTU members, and landowners as appropriate. This monitoring will not require separate OHF or other constitutional funding. In the event that there are other maintenance costs, potential sources of funding and volunteer labor include MNTU, MNDNR AMA maintenance funding, and other grant funds and organizations. MNTU volunteers will help provide long-term monitoring and periodic labor.

Actions to Maintain Project Outcomes

Year	Source of Funds	Step 1	Step 2	Step 3
One year after grant ends	MNTU volunteers or part of agency staff visits.	Inspect structural elements and vegetation.	If needed, alert DNR and develop action plans.	Conduct maintenance with volunteers and/or contractors if DNR does not.
Every 3 years thereafter	MNTU volunteers and/or agency.	Inspect structural elements and vegetation.	If needed, develop action plan with DNR.	Perform or assist DNR with maintenance if needed.

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

The various trout species present in a given stream or river (brook, brown and rainbow) are the key indicator species for our habitat projects. Our activities restore and/or enhance habitat that typically support a biomass of 100 to 130 pounds per acre of brook or brown trout in southeast Minnesota trout streams, and 40 pounds per acre of trout in northern Minnesota trout streams. These averages are generated from available data and published sources, and do not capture the variability inherent in populations of fish. Natural populations, including healthy populations with good habitat, vary among locations, and also rise and fall within lakes and rivers based upon weather, climatic conditions, flood events, etc. Most fish surveys conducted by DNR produce an index of abundance (catch per unit effort) rather than a population estimate.

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

Our metro trout stream projects will provide opportunities to racially, ethnically, and economically diverse people to learn conservation skills and work in the outdoors. We will actively recruit young people from BIPOC communities to participate in this project. Opportunities to join the habitat crew will be open to all, but we will specifically target recruitment efforts in the high schools, community colleges and community organizations serving the urban center. We hope this will be a gateway for members of the BIPOC communities to enjoy the outdoors who previously have had few opportunities to do so. Hopefully, participation as a member of a work crew will inspire the members to pursue education and careers in natural resource management and conservation. Since these metro area habitat projects will be close to home, we hope crew members will inspire friends and community members to also engage with these natural resources.

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?

- AMA
- Permanently Protected Conservation Easements
- County/Municipal
- Public Waters
- State Forests
- WMA

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?
Yes

Approp Year	Approp Amount Received	Amount Spent to Date	Leverage Reported in AP	Leverage Realized to Date	Acres Affected in AP	Acres Affected to Date	Complete/Final Report Approved?
2020	$1,474,000	$50,000	$225,000	-	188	23	No
2019	$2,359,000	$200,000	$510,000	-	205	0	No
2018	$2,291,000	$1,175,000	$874,000	$144,000	240	20	No
2017	$2,403,000	$1,970,000	$272,000	$330,000	148	45	No
2016	$1,975,000	$1,700,000	$131,000	$200,000	123	72	No
2015	$1,890,000	$1,890,000	$1,433,900	$1,433,900	284	284	Yes
2014	$1,900,000	$1,900,000	$507,400	$507,400	118	118	Yes
2013	$2,470,000	$2,470,000	$543,900	$543,900	135	135	Yes
2012	$2,120,000	$2,080,000	-	-	347	347	Yes
2011	$1,533,000	$1,533,000	$301,700	$301,700	91	91	Yes
2010	$1,269,000	$1,265,200	-	-	74	74	Yes
2009	$2,050,000	$2,050,000	$771,400	$771,400	277	277	Yes

Timeline

Activity Name	Estimated Completion Date
Begin planning, design and implementation of habitat enhancements.	July 2023
Complete implementation of habitat enhancements, including tree plantings and vegetation work.	June 2028

Budget

Totals

Item	Funding Request	Antic. Leverage	Leverage Source	Total
Personnel	$359,000	-	-	$359,000
Contracts	$1,223,000	$150,000	NRCS, USFWS, and other partners	$1,373,000
Fee Acquisition w/ PILT	-	-	-	-
Fee Acquisition w/o PILT	-	-	-	-
Easement Acquisition	-	-	-	-
Easement Stewardship	-	-	-	-
Travel	$20,000	-	-	$20,000
Professional Services	$350,000	-	-	$350,000
Direct Support Services	$100,000	$20,000	Trout Unlimited	$120,000
DNR Land Acquisition Costs	-	-	-	-
Capital Equipment	-	-	-	-
Other Equipment/Tools	$10,000	-	-	$10,000
Supplies/Materials	$851,000	$150,000	NRCS, USFWS, and other partners	$1,001,000
DNR IDP	-	-	-	-
Grand Total	**$2,913,000**	**$320,000**	**-**	**$3,233,000**

Personnel

Position	Annual FTE	Years Working	Funding Request	Antic. Leverage	Leverage Source	Total
Metro habitat crew members	2.0	2.0	$150,000	-	-	$150,000
Habitat enhancement staff	2.5	5.0	$209,000	-	-	$209,000

Amount of Request: $2,913,000
Amount of Leverage: $320,000
Leverage as a percent of the Request: 10.99%
DSS + Personnel: $459,000
As a % of the total request: 15.76%
Easement Stewardship: -
As a % of the Easement Acquisition: -

Describe and explain leverage source and confirmation of funds:
Leverage estimates are estimates only. We will aggressively pursue leverage, including on southeast Minnesota projects where federal Farm Bill funding may be available.

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?
We anticipate that acre amounts could be proportionately reduced.

Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?
We anticipate that personnel and DSS expenses could be proportionately reduced.

If the project received 50% of the requested funding

Describe how the scaling would affect acres/activities and if not proportionately reduced, why?
We anticipate that acre amounts could be proportionately reduced.

Describe how personnel and DSS expenses would be adjusted and if not proportionately reduced, why?
We anticipate that personnel and DSS expenses could be proportionately reduced.

Personnel

Has funding for these positions been requested in the past?
Yes

Please explain the overlap of past and future staffing and position levels previously received and how that is coordinated over multiple years?
Funding for the current personnel who perform similar work to that required to implement the FY2024 projects has been requested in the past. All staff code each hour they work to the particular OHF grant which funds the particular project worked on. Funding for the metro habitat crew personnel was requested in FY2023. FY2024 funding requested for the metro habitat crew is to extend its work another year (or perhaps more). The personnel costs in each OHF grant are estimates only. Any unused dollars budgeted for personnel and travel in a given grant will be shifted into contracts and materials budget categories to complete additional habitat work under that grant.

Contracts

What is included in the contracts line?
This is for contracted services on habitat enhancement construction projects, and includes heavy equipment use and other labor.

Travel

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

Explain the amount in the travel line outside of traditional travel costs of mileage, food, and lodging
None.

I understand and agree that lodging, meals, and mileage must comply with the current MMB Commissioner Plan:
Yes

Direct Support Services

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

The Direct Support Services requested represents a portion of Trout Unlimited's federal rate, which is approved annually. The requested amount is less than we would be eligible to claim based upon DNR approval of earlier grant agreements. Trout Unlimited is donating the other portion.

Other Equipment/Tools

Give examples of the types of Equipment and Tools that will be purchased?

Primarily hand tools and safety gear for cutting trees and brush, raking and seeding areas, etc.

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	170	170
Total	**0**	**0**	**0**	**170**	**170**

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	-	-	-	$2,913,000	$2,913,000
Total	**-**	**-**	**-**	**$2,913,000**	**$2,913,000**

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	55	0	87	0	28	170
Total	**55**	**0**	**87**	**0**	**28**	**170**

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	$505,000	-	$1,845,000	-	$563,000	$2,913,000
Total	**$505,000**	**-**	**$1,845,000**	**-**	**$563,000**	**$2,913,000**

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	-	-	-	$17,135

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	$9,181	-	$21,206	-	$20,107

Target Lake/Stream/River Feet or Miles

10 miles

Outcomes

Programs in metropolitan urbanizing region:

- Improved aquatic habitat indicators ~ *Measured through surveys of fish, macro invertebrates and/or exposed substrates. Abundance, size structure and species diversity are considered.*

Programs in the northern forest region:

- Improved aquatic habitat indicators ~ *Measured through surveys of fish, macro invertebrates and/or exposed substrates. Abundance, size structure and species diversity are considered.*

Programs in southeast forest region:

- Rivers, streams, and surrounding vegetation provide corridors of habitat ~ *Enhancement of in-stream and riparian corridor habitat creates miles of connected habitat. Outcomes in aquatic life are measured through surveys of fish, macro invertebrates and/or exposed substrates. Abundance, size structure and species diversity are considered.*

Parcels

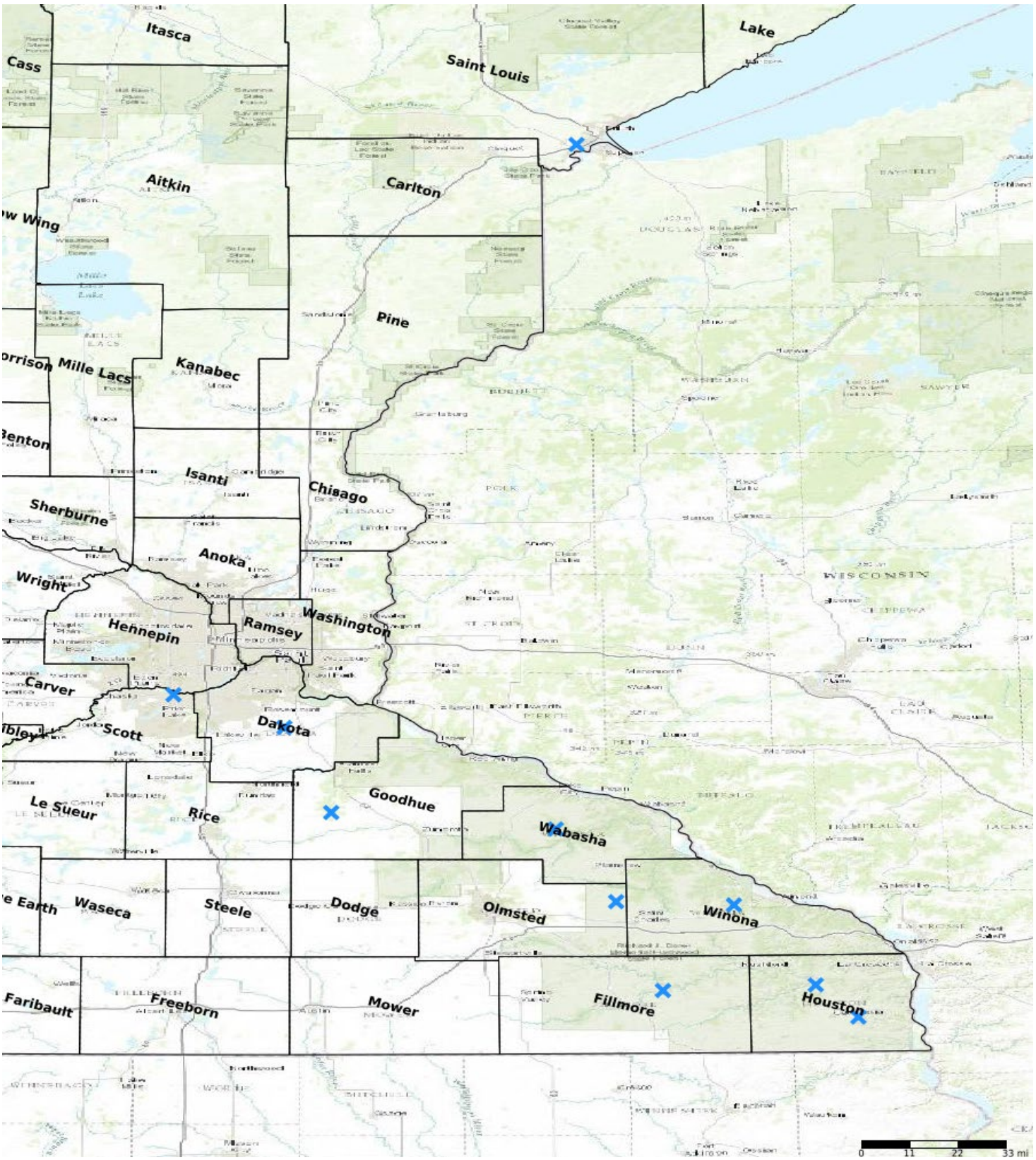
Sign-up Criteria?
No

Explain the process used to identify, prioritize, and select the parcels on your list:
MNTU focuses habitat enhancement and restoration efforts on those watersheds likely to continue to support viable, fishable populations of naturally reproducing trout fifty years and more from now. Work is done only where degraded habitat is a limiting factor for a quality, sustainable fishery. Priority locations are determined through consultations with MNDNR professionals, MNDNR management plans and surveys, other habitat and conservation planning efforts, MNTU members' knowledge of watersheds, and science-based criteria.

Restore / Enhance Parcels

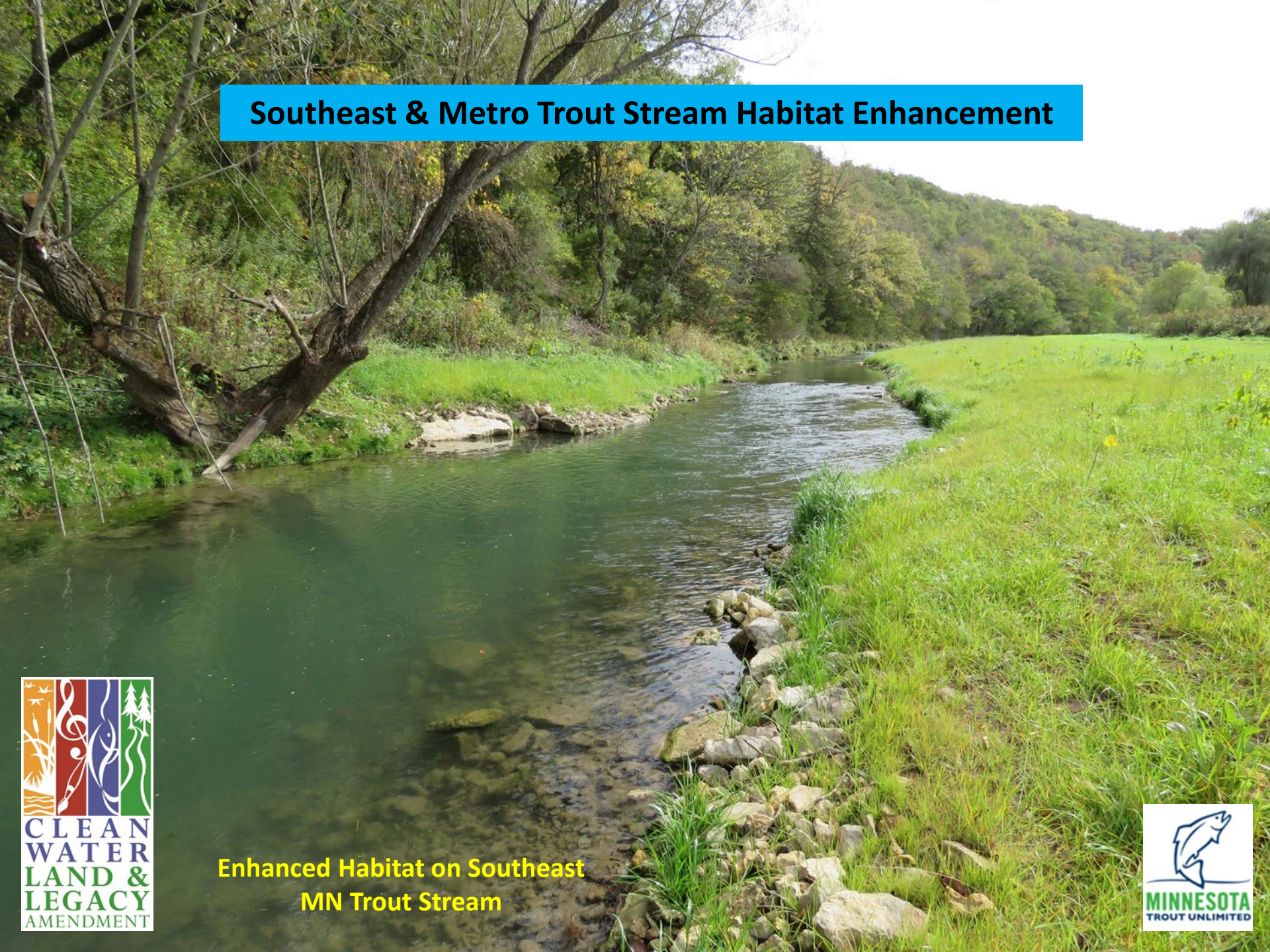
Name	County	TRDS	Acres	Est Cost	Existing Protection
Vermillion River & other metro	Dakota	11419223	50	$0	Yes
So. Branch Root River	Fillmore	10310213	7	$0	Yes
Little Cannon River	Goodhue	11018201	4	$0	Yes
Numerous streams - SE & N	Houston	10306210	47	$0	Yes
Crooked Creek	Houston	10205222	7	$0	Yes
Southeast Maintenance & Additional Enhancements	Olmsted	10711226	36	$0	Yes
Eagle Creek	Scott	11521207	5	$0	Yes
Keene Creek	St. Louis	04915212	5	$0	Yes
Spring Creek	Wabasha	11012229	3	$0	Yes
Garvin Brook	Winona	10708234	6	$0	Yes

Parcel Map



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

Southeast & Metro Trout Stream Habitat Enhancement



Enhanced Habitat on Southeast
MN Trout Stream

CLEAN WATER LAND & LEGACY AMENDMENT

MINNESOTA TROUT UNLIMITED

Enhanced Habitat on Metro Trout Stream

CLEAN WATER LAND & LEGACY AMENDMENT

MINNESOTA TROUT UNLIMITED

Habitat Project Descriptions - Minnesota Trout Unlimited - Fiscal Year 2024 *May 2022*

This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY2024 funding from the Outdoor Heritage Fund. Additional priority habitats projects may be completed depending upon funds leveraged and construction efficiencies realized. All projects will enhance and/or restore degraded habitat on existing public property, on land permanently protected by a conservation and management easement under the Aquatic Management Area system, or in public waters.

Methods. Methods used vary by region and project site. MNTU consults with professional in the MNDNR and uses the best available stream restoration and coldwater aquatic science to select specific habitat improvement methods for each stream that reflect the distinct characteristics of the watershed and ecological region, address the specific limiting factors (e.g., spawning substrate, adult cover, invertebrate production, etc.), and account for the land use practices. Habitat enhancement methods typically include: (1) sloping stream banks back to both remove streamside sediments that have previously been transported from uplands areas and better reconnect the stream to its floodplain, (2) removing shallow rooted woody vegetation (invasive box elder, buckthorn, etc.) to enable removal of accumulated sediments, reduce competition with desirable grass and plant species, and allow beneficial energy inputs (sunlight) to reach the streams, (3) stabilizing eroding stream banks, (4) installing overhead bank and other in-stream cover for trout, (5) utilizing soil erosion prevention measures, (6) seeding exposed banks and taking steps to firmly establish vegetation (including using native prairie grasses where appropriate and feasible), (7) improving angling accessibility, (8) fencing riparian corridors where appropriate to facilitate managed grazing and prevent damage from over-grazing, (9) removing barriers to fish movement, (10) restoring large cover logs to the channels of Northern forested streams to increase deep pool habitat, and (11) planting long lived trees along Northern forested streams to shade and cool the water, and provide a source of future cover logs.

These actions directly enhance physical habitat, and typically increase overall trout abundance (biomass), the number of larger trout, and levels of successful natural reproduction. Additional benefits include reduced erosion and sedimentation, cooler water temperatures, improved water quality, and increased connectivity of aquatic and riparian habitat for fish and myriad aquatic, terrestrial, and avian wildlife.

Metro Urbanizing Section

1. Eagle Creek (Scott)

Eagle Creek is a rare urban trout stream located in eastern Scott County. Habitat enhancement will help boost the trout population so anglers in the west and south metro can stop for a few hours of fishing close to home. Eagle Creek originates as two branches before draining to the Minnesota River as a single main stem. The west (main) branch begins in

Shakopee and the east branch begins in Savage. The single main stem then flows through Savage and the Minnesota Valley National Wildlife Refuge to the Minnesota River. The stream has a small self-sustaining population of wild brown trout and has not been stocked with brown trout since 1978. The MNDNR has recently begun reintroduction stockings of native brook trout. The primary factor limiting trout abundance in Eagle Creek is poor habitat, including limited spawning habitat.

This project would build upon the state's substantial investment in the 1990s, when it purchased the riparian corridor to protect this unique resource and the historic Boiling Springs. The project area extends from the confluence of the two branches downstream to Hwy 101. Throughout this 2,000 foot long reach the stream channel is wide, shallow, and dominated with sandy substrate. Deep water and other cover habitat are limited. Much of the stream has been isolated from the historical watershed and the lowered stream flow is maintained primarily by springs. The lack of flushing flows have increased the accumulation of sediments in the channel and kept it wide and shallow. The wide, shallow condition leads to warming water on sunny days.

This project will improve habitat in and along 2,000 feet of the main stem of Eagle Creek. To address historic channel downcutting and excessive sand, it is likely the low flow channel will be narrowed, and coarse substrate added. Cross veins and riffles will be placed to direct stream flow and increase spawning areas and other habitats beneficial to trout. Additional work focused on restoring native vegetation within occur in the larger stream corridor. We will partner with MNDNR Fisheries on all aspects of design, implementation, and maintenance.

2. <u>Vermillion River and other stream - Metro conservation corps</u>

The quality of habitat for trout and many other aquatic and riparian species is dependent upon healthy native vegetation outside the stream channel itself. Much of the vegetation bordering the remaining trout streams in the Twin Cities metropolitan area is of poor quality. To restore healthy vegetation - forest, prairie, and wetland – we need active management, which is best accomplished with manual labor performed by trained work crews.

Trained work crews, however, are in short supply during the busy summer work season. The project we are proposing will increase the capacity for accomplishing this work during the peak of the summer season while providing opportunities for young adults from the Twin Cities urban center to gain experience in conservation work. The project will provide opportunities to racially, ethnically, and economically diverse people to learn conservation skills and work in the outdoors. We will actively seek to recruit young people of color to participate in this project, as doing so we hope will be a gateway for some to enjoy the outdoors who have not had many opportunities to do so.

The work crew will undertake habitat improvements, including invasive tree and shrub removal, tree plantings and maintenance, controlled burns, prairie establishment, invasive plant control,

and wetland plantings. We will work with staff from the MNDNR, counties, and local soil and water conservation districts to compile a prioritized list of project sites within metro trout stream watersheds.

The need for habitat work on metro streams is great, as is the need for more workers willing to do the work. Trout Unlimited, like many conservation nonprofits, has for several years been striving to increase participation in conservation work by younger people and members of communities of color. For the past seven years we have operated outdoor education programs in Minnesota schools to teach students about watersheds and conservation. Offering opportunities for employment in hands-on conservation work is a natural extension of these programs. We hope participation as a member of a work crew will inspire the members to pursue education and careers in natural resource management and conservation.

We will begin with a pilot program that will offer employment to high school graduates and community college students in the Twin Cities metro area, who will work on habitat projects close to home. Opportunities to join the crew will be open to all, but we will specifically target recruitment efforts in the schools and community organizations serving the urban center. If the pilot is successful, we hope to expand the program by adding more crews, including to other parts of Minnesota.

Southeast Forest Section (Driftless area)

Southeast setting and tailored methods:

Due to its unique geology southeast Minnesota has no natural lakes and an abundance of cold, nutrient-rich, spring water. Anglers from around Minnesota and the United States are increasingly targeting the great trout fishing here, putting pressure on stream segments with better habitat. Improving badly degraded habitat on other stream reaches is not only essential to creating more robust, wild trout populations, it also spreads out angling opportunities.

The new projects in southeast Minnesota described below share a legacy of degraded habitat due to agricultural practices of the past century. The example below is typical of how and why MNTU improves habitat along trout streams in this ecological region. Designs and methods are adjusted to fit each project site, using lessons learned over the past several decades by Trout Unlimited, the DNR and other habitat practitioners.

Decades of erosion have led to wider, shallower, and warmer streams, and left a legacy of excessive streamside sediments which continually re-erode and cover in-stream habitat, food production areas and spawning habitat. In many cases shallow rooted invasive trees have taken over the riparian corridors, out competing native vegetation which better secures soils, and reducing energy inputs to the stream. Projects remove invasive trees and grade steep, eroding banks with machinery to remove sediments. Importantly, removal of streamside sediments reconnects the stream channel to its floodplain. We have significantly increased the

extent of sediment removal within 30 feet of the stream to provide faster release of flood energy to increase project durability and accommodate the increased severity and frequency of heavy rainfall events.

In addition to removing legacy sediments to create low "benches" for releasing flood energy, banks are sloped back to a more gradual slopes (3 to 1 or less) and the toe of the slope anchored to curb erosion. Banks are then seeded with deep rooted grasses to secure soils within the entire corridor and keep them from eroding in high water. The sloped banks allow floodwaters to quickly spread out into the floodplain and slow down, reducing the destructive impact of floods. Since the projects are designed for long-term ecological and hydraulic stability, once vegetation is well established flood waters typically just flatten grasses temporarily and do not damage the in-stream habitat structures and undercut banks. Our contracts contain warranty provisions to ensure vegetation is well establish and timely maintenance repairs performed.

Overhead cover habitat is created both by increasing the stream's depth via narrowing the channel or installing pool scouring features, and by placing cover habitat in select stream banks. These habitat features help recreate the undercut banks which had existed before settlement and land use practices altered the more stable flows which had gradually created and maintained them. The streams flow faster, deeper, and cooler, and provide vital overhead cover habitat.

Although our primary focus is restoring diverse habitat for trout, the habitat needs of all wildlife are considered. By restoring stream function, drastically reducing sedimentation, and replacing invasive trees with native grasses and forbes, the aquatic and riparian community of myriad species of invertebrates, amphibians, reptiles, birds, and terrestrial wildlife benefit. And we deliberately incorporate targeted nongame habitat features into each project.

The MNDNR is a key partner on all habitat projects. Other partners typically include farmer-landowners, the Natural Resources Conservation Service (of USDA) and local Soil and Water Conservation Districts.

3. Little Cannon River (Goodhue)

Located at the northern edge of the Southeast Forest Section, the Little Cannon River site is just minutes from a large portion of Metro area residents. This fee title AMA provides the only public access to the Little Cannon River and addressing its poor habitat condition is a top priority. The stream suffers from typical degraded conditions described above – overly wide and shallow channel, steep eroding streambanks, invasive trees falling into the channel, and little in-stream habitat. We will work closely with the MNDNR to design and implement a habitat project on approximately 1,700 feet of stream using the methods describe above tailored to this site. Trout Unlimited volunteers will assist with vegetation removal and management, including on upland areas on this 77acre AMA.

4. Spring Creek (Wabasha)

This stream is located along Hwy 60 between Zumbro Falls, MN and Wabasha, MN. This is one of the few trout streams in the area and it empties into the Zumbro River. The habitat here is very poor, as is the case on the other segments with public access easements. In-stream and riparian habitat will be enhanced in and along 1,500 feet of stream using the methods described above. Work will include sloping and stabilizing stream banks, installing in-stream cover for trout, and restoring appropriate vegetation to the riparian corridor. Local residents and visiting anglers will welcome the first segment of improved habitat on this stream.

5. South Branch Root River (Fillmore)

This project will improve trout habitat and access to it within the City of Lanesboro, MN. The segment of the Root River running through this picturesque town contains some trout, but far below its potential due to steep eroding banks and sunlight-robbing boxelders. These conditions also make angling treacherous and cause the resource to be largely unused. In partnership with the City of Lanesboro, we will enhance in-stream and riparian habitat from the historic Lanesboro Stone Dam downstream approximately 3,000 feet.

Grading of steep stream banks will create low "benches" for releasing flood energy, the remainder of the banks will be sloped to a more gradual 3 to 1 slopes, and the toe of the slope secured to curb erosion and provide cover habitat. Invasive boxelder will be removed and banks seeded with deep rooted grasses and forbes to better secure soils and keep them from eroding in high water. Once the banks have be lowered and reshaped, desirable native hardwoods may be planted. The channel will be narrowed and deepened, and in-stream cover habitat added. Wild brown trout will quickly colonize the new habitat and reward the anglers drawn to the newly accessible project reach. This stretch of the river within the Lanesboro city limits is one the few miles of trout water open year-round and will be well utilized in the future.

6. Crooked Creek (Houston)

This stream is located east of Caledonia, MN. The project site covers the first 3,000 feet of a two and a half mile long string of AMA easements spanning a badly degraded stretch of stream. In-stream and riparian habitat will be enhanced in and along 3,000 feet of stream using the methods described above. We will partner with the MNDNR Lanesboro Area Fisheries Office on design and implementation and explore the possibility of leveraging NRCS cost share funding to keep OHF costs to a minimum.

7. Garvin Brook (Winona)

This project will enhance habitat for wild brown trout in highly visible, accessible stretch of Garvin Brook located on the edge of Stockton, MN. The 2,500 foot long project site suffers from poor habitat typical of a legacy of poor land use in the upper watershed. Habitat enhancement methods be tailored to the site and include many of those summarized above at the start of this section.

We have already contacted local researchers to gather baseline data in this reach so that post-project data collection can yield useful information for possible refinement of habitat designs. Garvin Brook is a popular fishery. Providing more good habitat will both boost trout numbers and spread-out angling opportunities. In addition to the MNDNR Lanesboro Area Fisheries Office, we will likely partner with researchers from Winona State University and St. Mary's University.

8. Additional Enhancement of older projects (numerous counties)

Funding is needed for additional habitat enhancements on past projects in southeast Minnesota to ensure they continue to provide sustained habitat benefits well into the future. Using FY 2010 to FY 2013 OHF grants we completed 46 separate trout habitat projects enhancing approximately 39.9 miles of streams and 6 lakes, together totaling 789 acres of habitat. Routine maintenance and modest repair of even the best designed and built habitat projects is inevitable, especially given the increasing frequency and intensity of flooding. "Routine" floods often carry large trees into project reaches and drop then in bends, causing streambanks and associated habitat to blow out. Most of these projects are now 5 to 10 years old and need spot maintenance or measures to control invasive trees and boost native plants. A few need additional inputs to increase durability and function.

The value of performing regular maintenance or repair on past stream habitat projects was discussed with some LSOHC members, LSOHC staff and the DNR. Roving crews are being funded with OHF dollars to enhance the state's conservation catalog of Wildlife Management Areas and a similar effort is needed for fish habitat projects. In fact the need is greater in riparian settings where, in addition to vegetation management, regular flooding causes a host of other repair needs.

We are already inspecting past project sites and prioritizing maintenance work. Some maintenance work has already been completed. However, additional funding beyond the amount provided by the FY2021 appropriation is necessary to do modest maintenance on numerous additional OHF and DNR habitat projects. If funding allows us to complete maintenance and additional enhancement on all Fy2010 to Fy2013 projects, we will move on to projects completed with Fy2014 appropriations.

9. Numerous streams (vegetation focused)(numerous counties SE & N)

Many southeast trout stream corridors are being choked by shallow rooted, invasive trees which are severely limiting macroinvertebrate (food) production and trout abundance in the streams. In-stream conditions and riparian wildlife will often benefit from removal of this detrimental canopy and allow a return to more deeply rooted riparian grasses and beneficial sunlight, which triggers the food production cycle. Many streams with good groundwater input need only this vegetation management to improve habitat and allow the streams to naturally narrow and deepen.

Streams in central and northern areas often suffer from historic logging practices, tree diseases and pests, and recent neglect which has led to altered riparian forest composition. Unnaturally high beaver densities and increased water temperatures often result.

A prioritized list of stream corridors needing predominantly vegetative treatment will be reviewed with DNR. Sites will be selected which do not need other, more extensive measures such as major bank sloping. Treatment methods will vary based upon site conditions and may include logging, brushing, planting, controlled burns, and careful herbicide applications.

Northern Forest Section

10. Keene Creek (St. Louis)

Note that we are seeking construction funding only, since design and permitting work are being undertaken with FY2022 OHF funding.

Keene Creek is one of Duluth's top brook trout fisheries, despite decades of impacts to this "urban" trout stream. Duluth area streams were hammered by unprecedented flooding in June 2012, decimating brook trout habitat and leaving most streams with very unstable channels. Keene Creek did not escape damage. This project will restore the most visible segment of the stream channel, increasing the amount of deep pool habitat and trout cover, connecting good habitat and bolstering the size and sustainability of this native brook trout fishery.

Keene Creek begins in Hermantown and flows south through a forested park and enters Duluth above Skyline Drive. It then tumbles down the hillside in a series of pools and runs before it enters the St Louis River near Grassy Point. This surprisingly productive stream is a short bicycle ride from thousands of homes and is popular with children and adults alike. It is arguably the most productive, fishable trout stream on the western half of Duluth and supports itself through good natural reproduction. For this reason, we are focusing effort here, with plans to enhance or restore every degraded segment from the stream's headwaters to its mouth at the St. Louis River.

Earlier rounds of OHF funding are being used to enhance degraded habitat in the Hermantown portion of the stream where significant groundwater inputs and natural reproduction is found,

and below Skyline Drive in the parkland owned by the City of Duluth. This project, currently being designed and permitted with FY2022 OHF funding, will extend that work another 2,000 feet, including through the segment running under Interstate 35, which is elevated in this area. This reach flows through a well-used neighborhood park and will create great recreational opportunities for kids and families. MNDNR Duluth Area Fisheries Office agrees that this segment is a top priority for habitat work.

Portions of this reach had been straightened in the past and the 2012 floods destabilized and tore apart the stream channel in many places. Hurried repairs to protect structures did nothing to increase the quantity of pool habitat and woody cover.

In addition to removing fish passage barriers and stabilizing the channel, the project will directly increase the amount of deep pool habitat and overhead cover with large logs and boulders, using approaches similar to those employed on MNTU's Sucker River and Stewart River projects. The project will use significant volunteer labor provided by the Gitche Gumee Chapter of TU (Duluth), MNTU, local angling and conservation groups, and Duluth area residents.

The stream corridor is frequented by children and adults, but the poor habitat limits both trout numbers and angling interest. This highly visible and accessible project will create good habitat capable of holding catchable numbers of trout in a setting thousands can reach by a short walk or bike ride.

Notes: The terms "restore" and "enhance" are used interchangeably throughout the grant proposal and the individual project descriptions since the dividing line is not clear and definitions (or interpretations) not well settled. All projects proposed here will enhance habitat, and several will also restore it. These are construction projects and estimates of the relative mix of contract versus materials are rough estimates only. If substantial contracting efficiencies and/or leveraged funding allows we may extend the length of one or more project or add other streams with LSOHC staff approval.

MNTU habitat projects completed with Fy2010 to Fy2013 OHF funding:

1. Hay Creek (Goodhue);
2. Kabekona Creek (Hubbard);
3. Lawndale Creek (Wilkin);
4. Little Rock Creek (Benton);
5. Middle Br. of Whitewater (Olmsted);
6. Mill Creek site 1 (Fillmore);
7. Pickwick Creek (Winona);
8. Trout Run Creek (Fillmore);
9. Straight River (Becker &Hubbard);
10. Sucker River site 1 (St. Louis);
11. Vermillion River site 1 (Dakota);
12. Vermillion River site 2 (Dakota);
13. "Fuel for Habitat" (more than 90 acres and 6 miles of riparian corridor);
14. Rush Creek (Winona);
15. Hay Creek site 3 (Goodhue);
16. Lost Creek (Fillmore);
17. Pine Creek site 1 (Winona);
18. Vermillion River site 3 (Dakota);
19. West Indian Creek (Wabasha);
20. Garvin Brook site 1 (Winona);
21. Hay Creek site 4 (Goodhue);
22. Seven Mile Creek (Nicollet);
23. Little Isabella River (Lake);
24. Manitou River (Lake);

25. Sucker River 2 (St. Louis);
26. Sucker River site 3 (St. Louis);
27. Cold Spring Brook (Wabasha);
28. Pine Creek site 2 (Winona);
29. Mill Creek site 2 (Olmsted);
30. Blagsvedt Creek (Fillmore);
31. So. Fork Root (Fillmore);
32. Kimball Creek (Cook);
33. Kimball Lake (Cook);
34. Mink Lake (Cook);
35. Boys Lakes (Cook);
36. Garvin Brook site 2 (Winona);
37. Pine Creek site 3 (Winona);
38. Hay Creek site 5 (Goodhue);
39. Little Stewart River (Lake);
40. Stewart River planting sites (Lake);
41. East Indian Creek site 1 (Wabasha);
42. Mill Creek site 3 (Olmsted);
43. Camp Creek (Fillmore);
44. Beetle Lake (Lake);
45. Redskin Lake (Lake);
46. North Shady Lake (Cook).