

Lessard-Sams Outdoor Heritage Council

Fiscal Year 2022 / ML 2021 Request for Funding



Date: May 28, 2020

Program or Project Title: Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 13 (HRE01)

Funds Requested: \$3,035,000

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County Locations: Cook, Dakota, Fillmore, Goodhue, Lake, St. Louis, and Wabasha.

Eco regions in which work will take place:

- Northern Forest
- Southeast Forest
- Metro / Urban

Activity types:

- Enhance

Priority resources addressed by activity:

- Forest
- Habitat

Abstract:

Minnesota Trout Unlimited will enhance and restore degraded habitat for fish and wildlife in and along priority coldwater streams located on existing public lands and conservation easements. Trout streams are a relatively scarce resource. Increasing threats to them require accelerating habitat work to reduce the backlog of degraded stream reaches, improve riparian forests to improve stream flows and temperatures, and buffer streams from larger, more frequent rainfall and flood events. Outcomes will be maximized by improving the connectivity of habitat and fish and wildlife populations. Timely maintenance of old projects will ensure habitat outcomes continue for many years.

Design and scope of work:

Only six percent of Minnesota's streams support any trout, and many have degraded habitat which severely limits their productivity. Even where riparian corridors protect streams from future harm, past habitat degradation cannot be reversed without active enhancement or restoration. 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 propose to restore or enhance habitat in and along these public waters (in these counties):

1. Keene Creek (St. Louis);
2. Split Rock River (Lake);
3. Baptism River (Lake);
4. Cook County Trout Stream (Cook);
5. Southeast MN streams (maintenance in numerous counties);
6. Mill Creek (Fillmore);
7. Gilbert Creek (Wabasha); and
8. Metro and outstate streams (statewide).

If contracting efficiencies or leveraged funding stretches Outdoor Heritage Fund dollars we will extend project lengths or work on additional streams to improve more habitat.

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 and terrestrial 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 and steelhead 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 using MNTU members' knowledge of watersheds, MNDNR management plans and surveys, other habitat and conservation planning efforts, consultations with MNDNR professionals, 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. We will 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 or steelhead 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 total 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 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 connectivity and restore riparian forest canopy in northern watersheds. The state must continue restoring or enhancing degraded habitat to safeguard and improve the productivity and sustainability of these rare wild fisheries for future generations to enjoy. Timely maintenance now 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. Targeted work improving forest habitat in connected corridors along the Split Rock River will benefit not only trout and steelhead fisheries, but numerous wildlife populations and native plant communities.

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

- H3 Improve connectivity and access to recreation
- H6 Protect and restore critical in-water habitat of lakes and streams

Which 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 Fy2022 projects will directly enhance or restore habitat along more than 14 miles of trout streams and benefit a far larger number of miles of trout water.

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

Metro / Urban:

- Enhance and restore coldwater fisheries systems

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 29 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.

Relationship to other funds:

- Not Listed

Describe the relationship of the funds:

Not Listed

Does this program include leverage in funds:

Yes

We will leverage private funding of Trout Unlimited, which Trout Unlimited will contribute to cover a majority of its direct support

service costs. TU members and chapters will donate in-kind labor/services. 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 the southeast Minnesota projects, as well as funding for fish passage/culvert replacement work in the Lake Superior basin.

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:

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

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

Not Listed

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.

Explain the things you will do in the future 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.

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 (AMA, Permanently Protected Conservation Easements County/Municipal, Public Waters, State Forests,**

National Forest land)

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? - **Yes**

Past appropriations and spending to date:

Apprp Year	Approp Amount Received	Approp Amount Spent to Date	Leverage as Reported in AP/th>	Leverage Realized to Date	Total Acres Affected in AP	Total Acres Affected to Date	Program Complete and Final Report Approved?
2009	2050000	2050000	771400	771400	277	277	yes
2010	1269000	1265200	0	0	74	74	yes
2011	1533000	1533000	301700	301700	91	91	yes
2012	2120000	2080000	0	0	347	347	yes
2013	2470000	2470000	543900	543900	135	135	yes
2014	1900000	1900000	507400	507400	118	118	yes

Accomplishment Timeline

Activity	Approximate Date Completed
Begin planning, design and implementation of habitat enhancements.	July 2021
Complete implementation of habitat enhancements, including tree plantings and vegetation work.	June 2026

Budget Spreadsheet

Total Amount of Request: \$3,035,000

Budget and Cash Leverage

BudgetName	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$220,000	\$0		\$220,000
Contracts	\$1,330,000	\$150,000	USFWS, USFS, and other partners	\$1,480,000
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	\$20,000	\$0		\$20,000
Professional Services	\$510,000	\$0		\$510,000
Direct Support Services	\$50,000	\$50,000	Trout Unlimited	\$100,000
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$5,000	\$0		\$5,000
Supplies/Materials	\$900,000	\$150,000	USFWS, USFS, and other partners	\$1,050,000
DNR IDP	\$0	\$0		\$0
Total	\$3,035,000	\$350,000		\$3,385,000

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Habitat enhancement staff	1.50	5.00	\$220,000	\$0		\$220,000
Total	1.50	5.00	\$220,000	\$0		\$220,000

Amount of Request: \$3,035,000
 Amount of Leverage: \$350,000
 Leverage as a percent of the Request: 11.53%
 DSS + Personnel: \$270,000
 As a % of the total request: 8.90%
 Easement Stewardship: \$0
 As a % of the Easement Acquisition: -%

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 TU's federal rate, which is approved annually. The requested amount likely represents approximately one third to one half of what we would be eligible to claim based upon DNR approval under an earlier grant agreement. TU is donating the other portion.

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.

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

Describe and explain leverage source and confirmation of funds:

Leverage estimates are estimates only. We hope to secure approximately \$300,000 from federal sources, especially to assist with removal of fish passage barriers/culvert replacements in the Lake Superior tributaries. We will aggressively pursue leverage here and on southeast Minnesota projects where Farm Bill funding may be available.

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:

Each of the projects is a stand-alone project or collection of small stand-alone projects. Administrative costs are based upon actual hours of staff time (personnel) and travel and are estimates. Any unused dollars budgeted for personnel and travel will be poured back into doing additional habitat work.

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?

We recently hired a staff person for southeast Minnesota to ensure all projects in the region, across existing and future OHF grants, are very well implemented and maintained. All staff code each hour they work to the particular OHF grant which funds the particular project worked on. The personnel costs in each OHF grant are estimates. Any unused dollars budgeted for personnel and travel in a given grant will be shifted into contracts and materials budget categories to do additional habitat work under that grant.

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	400	351	751
Total	0	0	400	351	751

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	\$400,000	\$2,635,000	\$3,035,000
Total	\$0	\$0	\$400,000	\$2,635,000	\$3,035,000

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	15	0	170	0	566	751
Total	15	0	170	0	566	751

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	\$30,000	\$0	\$1,290,000	\$0	\$1,715,000	\$3,035,000
Total	\$30,000	\$0	\$1,290,000	\$0	\$1,715,000	\$3,035,000

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	\$1,000	\$7,507

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	\$2,000	\$0	\$7,588	\$0	\$3,030

Automatic system calculation / not entered by managers

Target Lake/Stream/River Feet or Miles

29 miles

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 *Measured through surveys of fish, macro invertebrates and/or exposed substrates. Abundance, size structure and species diversity are considered.*

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 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.*

Parcel List

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

MNTU focuses habitat enhancement and restoration efforts on those watersheds likely to continue to support viable, fishable populations of naturally reproducing trout, steelhead, and salmon 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 using MNTU members' knowledge of watersheds, MNDNR management plans and surveys, other habitat and conservation planning efforts, consultations with MNDNR professionals, and science-based criteria.

Section 1 - Restore / Enhance Parcel List

Cook

Name	TRDS	Acres	Est Cost	Existing Protection?
Cook County trout stream	06202120	5	\$0	Yes

Dakota

Name	TRDS	Acres	Est Cost	Existing Protection?
Metro and outstate streams (prioritized)	11420234	87	\$0	Yes

Fillmore

Name	TRDS	Acres	Est Cost	Existing Protection?
Mill Creek	10511231	7	\$0	Yes

Goodhue

Name	TRDS	Acres	Est Cost	Existing Protection?
Southeast Maintenance & Additional Enhancements	11215226	120	\$0	Yes

Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
Baptism River	05708229	120	\$0	Yes
Split Rock River	05509226	400	\$0	Yes

St. Louis

Name	TRDS	Acres	Est Cost	Existing Protection?
Keene Creek	04915212	5	\$0	Yes

Wabasha

Name	TRDS	Acres	Est Cost	Existing Protection?
Gilbert Creek	11113211	7	\$0	Yes

Section 2 - Protect Parcel List

No parcels with an activity type protect.

Section 2a - Protect Parcel with Bldgs

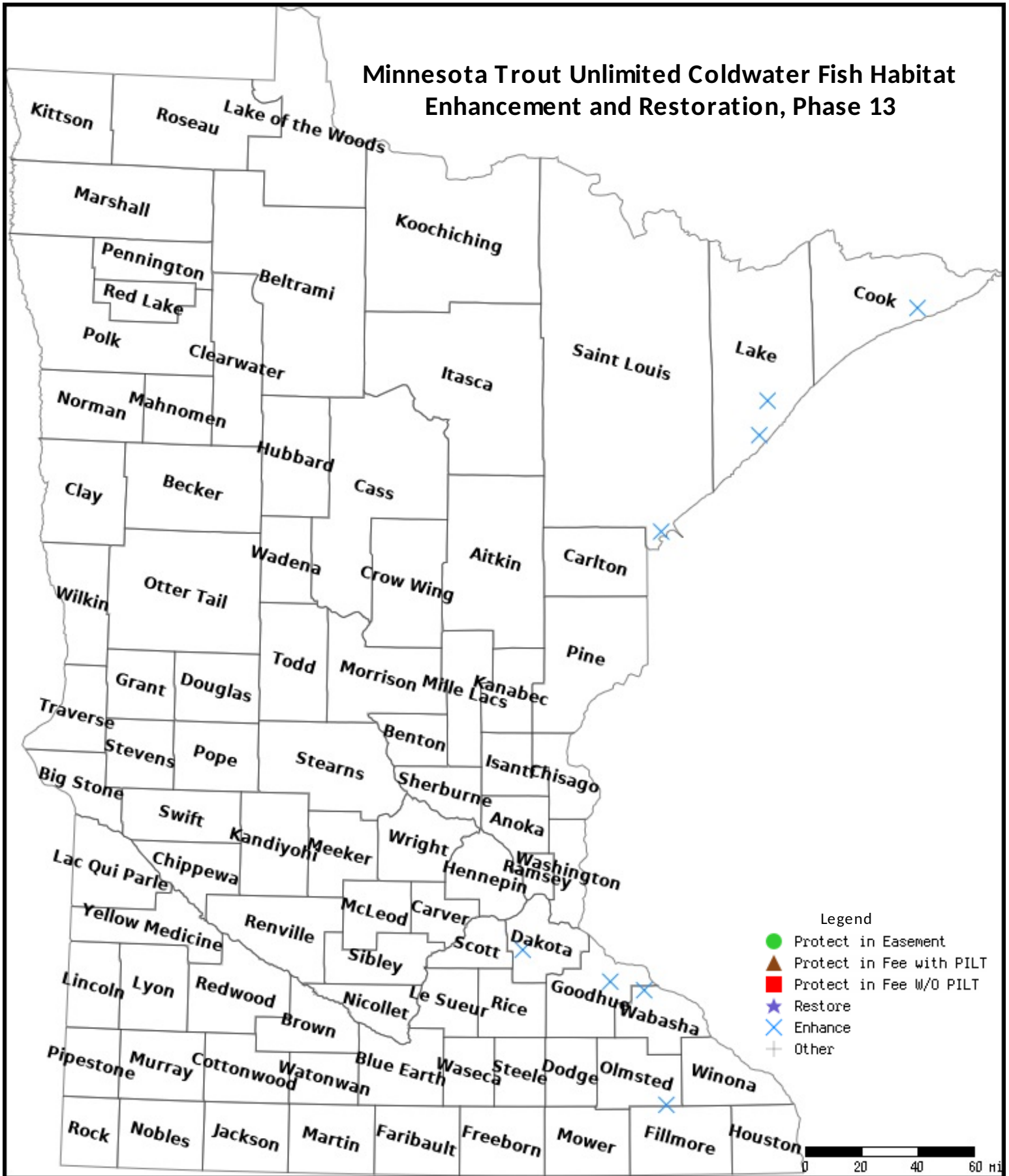
No parcels with an activity type protect and has buildings.

Section 3 - Other Parcel Activity

No parcels with an other activity type.

Parcel Map

Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 13



Data Generated From Parcel List

MNTU Coldwater Fish Habitat Enhancement and Restoration, Phase 13

Enhanced Northern
MN Trout Stream



Enhanced Southeast
MN Trout Stream



This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY2022 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 plant and grass 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) restoring large cover logs to the channels of Northern forested streams to increase deep pool habitat, and (10) 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 corridors.

Northern Forest Section

1. Keene Creek (St. Louis)

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. The proposed Fy2022 project 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.

2. Split Rock River (Lake)

This river supports native brook trout and a popular wild steelhead fishery. Healthy trout and steelhead fisheries are products of the forests through which they flow. However, due to recent outbreaks of tree diseases and pests, and lack of timely tree plantings, many forest stands lack conditions most favorable for long term productivity of

coldwater fisheries, as well as for other game and wildlife. We propose to use professional foresters to develop management plans for DNR Fisheries' fee title Aquatic Management Area lands in this watershed and then undertake tree plantings to attain desirable conditions for fish and wildlife.

How well the forests within a given watershed have been managed in the past and how well they are managed in the future determine to what degree the coldwater fisheries in streams flowing through them will be productive, or whether the fisheries might vanish entirely. A healthy forest is essentially a sponge, which holds precipitation, both snowmelt and rainfall, and slowly releases it over time. A healthy forest reduces destructive peak flows and increase base flows, especially in warm summer months.

Fisheries biologists and foresters know that trout and steelhead fisheries benefit most from older forests with long-lived species capable of providing greater water storage, mature canopy, a supply of future large wood (as old trees fall into the floodplain), and riparian tree species not attractive to beavers. However, given the hodgepodge of past activities, tree diseases and pests, many stands lack these conditions and cannot reach or maintain these desirable conditions without tree harvest and tree planting. North Shore forests often need active management to achieve a healthy, mature forest that will store water and slowly release it into trout streams. The need for active management is increasing due to the warming climate and the waves of tree pests and diseases it will bring. We are already seeing many forests degenerating into brushland.

To protect the premier fisheries in this watershed, the DNR Fisheries owns more than 2,000 acres of riparian forests along the Split Rock River. However, it has not had funding for professional foresters to "ground truth" the limited stand information and develop good, data driven forest management roadmaps. Nor has DNR Fisheries had funding to plant trees where this is needed to convert forests to long-lived species capable of providing greater water storage and canopy, as well as wildlife habitat.

We will retain one or more professional forester to inventory the condition of forest stands on these Aquatic Management Area lands and work with the DNR Area Fisheries Office to develop sound forest management plans to serve as roadmaps for each parcel. These plans will then be used by DNR to guide the scope of future harvest and plantings on these Fisheries fee title lands.

Extensive tree plantings will be done in 2022 to spring 2026 on approximately 400 acres and be timed to take advantage of planned harvest by the DNR Forestry Division.

3. Baptism River (Lake)

The Baptism River enters Lake Superior in Tettegouche State Park near Finland, Minnesota and it hosts a top tier coldwater fishery. Fisheries managers and researchers

agree that this river is well suited to sustain coldwater fisheries long into the future - with a little help. In addition to supporting popular steelhead and coaster brook trout fisheries below barrier waterfalls in Tettegouche State Park, the extensive upper watershed holds good native brook trout populations in numerous tributaries and main stem reaches.

While the watershed is forested and only lightly developed, an extensive network of roads and old rail lines have resulted in a large number of poorly designed or maintained crossings which block the movement of brook trout at critical times of the year. Brook trout move considerable distances to reach cold water during dry and/or hot summer conditions, spawning areas in the fall, and deeper pool habitat for wintering. Perched and collapsed culverts act as dams, blocking access to essential habitat at key times of year. This fragmentation and loss of habitat connectivity is one of the greatest threats to sustaining wild brook trout populations. Research indicates the scope and impact of this habitat fragmentation will grow as climate and water temperatures warm.

We will work with DNR Fisheries, the local Soil & Water Conservation Districts ("SWCDs"), local highway departments, and other partners to replace up to ten of the worst culverts which block brook trout passage. Lake County previously conducted a survey of culverts in the watershed and DNR Finland Area Fisheries Office is verifying each site to determine which culverts are having the largest negative impact upon trout populations. The DNR has identified 55 problem crossing in the Baptism River watershed and developed criteria to prioritize replacements. We will use DNR's prioritized list for planning meetings with DNR, SWCD staff, MPCA, highway authorities, and other partners to identify those of the worst culverts which partners are able to collaborate with us to replace. This will increase leverage and stretch the natural resource impact of OHF dollars. The quantity of miles of trout habitat to which access will be restored will be a key consideration. With replacement plans and cost estimates in hand we will aggressively seek to leverage federal funds or other sources of cost sharing. Many miles of productive trout habitat and increased populations will be gained through removal of these barriers.

4. Cook County Trout Stream (Cook)

We propose to enhance brook trout habitat on a second site using a new approach of working closely with the timber harvest industry. The project will increase the amount and quality of year-round cover habitat for native brook trout along approximately 2,000 feet of stream by placing large cover logs currently missing from stream channels. If timber harvest in a given subwatershed is being conducted at sustainable levels and site-level timber harvesting and forest management guidelines are being followed, timber harvest on a given parcel need not have significant negative impacts on coldwater fisheries, and can even improve long term health by improving forest

composition and health. Where thoughtful timber harvest on public land is already planned for a parcel through which a trout stream flows, we propose to pay the logger to place some large cover logs in carefully chosen locations in the stream channel. Since the trees and right equipment for placing logs are already on site, this is a very cost-effective way to restore large woody cover habitat, while making the timber sale more profitable for the logger.

Early logging activities removed logjams and large cover logs from stream channels, and altered the hydrology. Two or more logging cycles since then have resulted in a relatively young forest ecosystem which will not naturally return large cover logs to the stream channels for another 50 to 75 years. Large logs belong in northern forest streams. They provide overhead cover and scour deeper pools vital for winter trout survival. The relative absence of deep water and cover habitat utilized by adult brook trout is a limiting factor in providing a more productive and resilient fishery.

We will increase the amount of pool habitat and overhead cover by carefully placing large logs within streams on project sites totaling at least 2,000 feet. We hope to further demonstrate the efficiency of a new approach to improving trout habitat in forested areas of the state, which several entities could adopt. The site will be along one of the top tier watersheds in Cook County (Temperance, Poplar, Cascade, Devil Track, Kimball or Kadunce Rivers).

Southeast Forest Section (Driftless area)

5. Maintenance and Additional Enhancement of older projects (numerous counties)

We are requesting funding to conduct routine maintenance and habitat upgrades 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 them in bends, causing streambanks and associated habitat to blow out. Most of these projects are now 5 to 10 years old and need at least spot maintenance or measures to control invasive trees or to boost native plants. A few need additional inputs to increase durability and function.

The value of a roving habitat crew to perform regular maintenance or repair on past stream habitat projects, was discussed with some LSOHC members, LSOHC staff and DNR. These types of crews are being funded with OHF dollars to enhance the state's conservation catalog of Wildlife Management Areas. The need is even greater in riparian settings where, in addition to vegetation management, regular flooding causes

a host of other repair needs. However, we are not proposing to put together a conservation corps style roving crew for two reasons: we believe DNR is much better equipped for this task, and we suspect several projects will require at least a mini excavator to move large logs, install large rock, etc.

We had hoped that we and DNR would be able to perform regular maintenance and repair on older projects with DNR funding and some limited TU funding. Developing a good system of inspection and swift repair has been stymied by procurement rules and no ready funding source, even as the number of completed projects grows. While we hope to find other mechanisms for funding ongoing maintenance soon, the need for maintenance and repair of OHF projects completed 4 to 10 years ago is pressing.

Consequently, we propose to develop maintenance and repair plans for all projects completed with Fy2010 to Fy2013 appropriations and perform as much maintenance and repair work as a Fy2022 appropriation will allow. If the budget allows us to complete the necessary maintenance/additional enhancement on all Fy2010 to Fy2013 projects, we will move on to projects completed with Fy2014 appropriations.

A list of stream habitat enhancement projects completed with funding from Fy2010 to Fy2013 appropriations is attached.

6. Enhancing more degraded streams:

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 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.

The MNDNR is a key partner in work on all projects. Other partners typically include farmer-landowners, the NRCS and local Soil and Water Conservation Districts.

6. Mill Creek (Fillmore)

This project builds upon nearly 4 miles of habitat previously enhanced by MNTU and Hiawatha TU on Mill Creek, near Chatfield, MN. In 2016, due to leveraging other funds and efficient contracting, we added a project on Mill Creek in the city park. Adjacent to a skate park and featuring a fishing pier (installed with non-OHF funding), the improved habitat has proven to be extremely popular not only with trout, but with young and adult anglers. We propose to extend the project another 3,000 feet to boost the trout population, spread out angling opportunities, and attract more resource users.

The project reach has high eroding banks, is overly wide and shallow, and lacks in-stream cover. Eroding banks will be sloped back to a more gradual 3 to 1 slope and the toe anchored to curb erosion. The channel will be narrowed and deepened, and in-stream cover habitat added. Wild brown trout will colonize the new habitat quickly and within a few years a robust trout population will reward anglers drawn to the highly accessible project reach, which is now open to year-round trout angling.

7. Gilbert Creek (Wabasha)

Gilbert Creek is located on the edge of Lake City, MN and is an easy drive from the southern and eastern suburbs. Gilbert Creek has cold water, good water quality and a wild brown trout, but its lack of good habitat prevents it from supporting a robust population now. Thus, despite its location and accessibility via a long easement, few anglers fish it. The project will enhance habitat on approximately 3,000 feet of stream

and trout numbers should soar. Local anglers and visitors from the suburbs will be drawn to the high-quality angling opportunity created.

This stream segment is plagued by the typical southeast legacy of steep eroding banks often topped with invasive, shallow rooted boxelder trees which topple into the stream and cause banks to "blow out" in the next high water event. The proposed work will remove undesirable trees and brush, re-slope the banks, re-contour and stabilize the stream channel, improve its connection to its natural flood plain, and add in-stream cover habitat.

Metro and Statewide

8. Numerous streams statewide (prioritized maintenance list)

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. Efforts to restore healthier riparian forests in central and northern parts of the state are often hampered by unnaturally high beaver densities tied to second or third growth forest conditions. To prevent inundation of planted areas, as well as to prevent excessive warming of the water and sedimentation, some targeted beaver management may also be undertaken.

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);

Attachment to
MNTU's FY2022 Proposal to LSOHC

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).