

Lessard-Sams Outdoor Heritage Council

Fiscal Year 2020 / ML 2019 Request for Funding

HRE 01



Date: May 31, 2018

Program or Project Title: Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 11

Funds Requested: \$3,750,000

Manager's Name: John Lenczewski

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County Locations: Dakota, Fillmore, Houston, Lake, Pine, St. Louis, Wabasha, and Winona.

Regions in which work will take place:

- Northern Forest
- Southeast Forest
- Metro / Urban

Activity types:

- Protect in Easement
- Enhance

Priority resources addressed by activity:

- Habitat

Abstract:

Minnesota Trout Unlimited will enhance and restore habitat for fish and wildlife in and along priority coldwater streams located on existing conservation easements and public lands around the state. Trout streams are a relatively scarce resource and increasing threats to them require accelerating habitat work to reduce the backlog of degraded stream reaches. Population outcomes will be maximized by improving the connectivity of habitat and fish and wildlife populations, and building upon work on adjacent sections. Stream easements will be acquired in Pine County and the Duluth area to project the highest quality trout habitat and facilitate habitat enhancement.

Design and scope of work:

Only six percent of Minnesota's streams are capable of supporting any trout, and many have degraded habitat which severely limits their productivity. Even where riparian corridors largely protect streams from future harm, past habitat degradation cannot be reversed without active enhancement or restoration. Minnesota Trout Unlimited ("MNTU") proposes to directly restore or enhance degraded habitat on priority streams with existing protections under the Aquatic Management Area system or public ownership. We propose to restore or enhance habitat in and along these public waters (and counties):

1. Trout Brook (Dakota);
2. Hay Creek (Pine County);
3. Beaver Creek (Houston);
4. Cedar Valley Creek (Winona);
5. Gilbert Creek (Wabasha);
6. Mill Creek (Fillmore);
7. Pine Creek (New Hartford Creek) (Winona);
8. Rice Creek (Fillmore);
9. Torkelson Creek (Fillmore);
10. Split Rock River (Lake);

11. Manitou River (Lake);
12. Keene Creek (St. Louis);
13. Duluth area streams (St. Louis);
14. Numerous streams statewide (prioritized maintenance list).

We will also protect via trout stream easements segments of native brook trout streams in Pine County and the Duluth area. Once acquired the easements will be held by the MNDNR.

If contracting efficiencies or leveraged funding permits we will extend project lengths and work on additional streams.

Individual project descriptions are provided in an attachment.

Goals and scope of work.

The goals of each project 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 forests as appropriate, (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 and are discussed in the individual project descriptions provided in the attachment.

How priorities were set.

MNTU focuses 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 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.

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:

The 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 proposed projects will directly restore or enhance approximately 16 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 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 16 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.

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 watershed.

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 enjoyed by generations of anglers. While trout are the apex predator and key indicator species in coldwater systems, a host of rare aquatic species are uniquely associated with these systems. Well-functioning coldwater aquatic ecosystem are far less “common” than the 6% of Minnesota’s total stream and river miles which theoretically can still support trout. They are very rare in the western half of the state. Even many streams considered to be the best remaining trout streams have badly degraded segments which disrupt connectivity and have significant impacts on the productivity and long term resilience (and self-sustainability) of the overall trout population. Our trout streams face growing threats from warming temperatures, increased frequency of severe flooding, and rising demand for groundwater pumping from the aquifers which supply vitally important cold water inputs. 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.

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

The various trout species (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.

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:

- 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.

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. Once in-stream work is completed and riparian vegetation well established, no significant maintenance is usually required in order to sustain the habitat outcomes for several decades. Reconnected floodplains allow floodwater 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 gains which are 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, or 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
Year after the grant ends.	MNTU volunteers or part of regular agency visits.	Inspect structural elements and vegetation.	Alert DNR and develop actions needed.	Conduct maintenance with volunteers and/or contractors if DNR does not.
Every 3 years thereafter	MNTU volunteers or agency.	Inspect structural elements and vegetation	Develop action plan with DNR.	Perform or assist DNR with maintenance if needed.

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

While 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 extend throughout the stream or complex of streams. Degraded sections are no longer providing habitat, clean water benefits, angling opportunities, or other enticements which increase outdoor recreation and encourage public appreciation and stewardship of aquatic ecosystems. In several cases critical spawning and nursery habitat has been destroyed or blocked by flooding or other abuses, leaving these streams vulnerable to complete population loss. Even where riparian corridors are protected from future harm, this protection alone cannot reverse past habitat degradation without active intervention. The state must continue restoring or enhancing degraded habitat to safeguard and improve the productivity and long-term sustainability of these rare wild fisheries for future generations to enjoy.

How does this proposal include leverage in funds or other effort to supplement any OHF appropriation:

We anticipate that a number of the individual projects will leverage substantial other funding, including especially federal NRCS funding on the southeast Minnesota projects (estimate \$400,000). It is also likely that we will leverage USFWS grants on several projects (\$50,000). We will also leverage not only volunteer labor from TU members and others, but several partners (MNDNR, SWCD offices, etc.) will contribute significant amounts of time and/or dollars assisting on the projects. We hope to leverage substantial federal funding on Lake Superior basin projects.

Relationship to other funds:

- Not Listed

Describe the relationship of the funds:

Not Listed

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:

Not applicable.

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

Appropriation Year	Source	Amount
n/a	n/a - each project is a new stand alone project	

Activity Details

Requirements:

If funded, this proposal will meet all applicable criteria set forth in MS 97A.056 - **Yes**

Is the land you plan to acquire (easement) free of any other permanent protection - **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, County/Municipal, Public Waters, State Forests, State Park)**

Do you anticipate federal funds as a match for this program - **Yes**

Are the funds confirmed - **No**

What is the approximate date you anticipate receiving confirmation of the federal funds - **October 2020 or later, since they need completed designs and permits first.**

Land Use:

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

Will the eased land be open for public use - **Yes**

Fishing

Are there currently trails or roads on any of the acquisitions on the parcel list - **No**

Will new trails or roads be developed or improved as a result of the OHF acquisition - **No**

Accomplishment Timeline

Activity	Approximate Date Completed
Begin project planning, survey, design and permitting work following a July 2019 appropriation.	Begin summer 2019
Begin communications with riparian landowners re easements	Summer 2019
Begin habitat enhancements on several projects in 2020 field work season.	Begin 2020 field work season
Complete title work and closing on easements throughout 2020 and first half 2021.	2021
Complete all habitat enhancements, including establishment of riparian vegetation.	June 2024

Budget Spreadsheet

Total Amount of Request: \$3,750,000

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$120,000	\$0		\$120,000
Contracts	\$1,510,000	\$250,000	NRCS and USFWS	\$1,760,000
Fee Acquisition w/ PILT	\$0	\$0		\$0
Fee Acquisition w/o PILT	\$0	\$0		\$0
Easement Acquisition	\$380,000	\$0		\$380,000
Easement Stewardship	\$40,000	\$0		\$40,000
Travel	\$10,000	\$0		\$10,000
Professional Services	\$630,000	\$0		\$630,000
Direct Support Services	\$30,000	\$60,000	TU	\$90,000
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$20,000	\$0		\$20,000
Supplies/Materials	\$1,010,000	\$200,000	NRCS and USFWS	\$1,210,000
DNR IDP	\$0	\$0		\$0
Total	\$3,750,000	\$510,000		\$4,260,000

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Program manager	0.40	3.00	\$70,000	\$0		\$70,000
Watershed coordinator	0.10	3.00	\$10,000	\$0		\$10,000
Program interns	0.25	3.00	\$30,000	\$0		\$30,000
field work interns	0.20	3.00	\$10,000	\$0		\$10,000
Total	0.95	12.00	\$120,000	\$0		\$120,000

Amount of Request: \$3,750,000

Amount of Leverage: \$510,000

Leverage as a percent of the Request: 13.60%

DSS + Personnel: \$150,000

As a % of the total request: 4.00%

Easement Stewardship: \$40,000

As a % of the Easement Acquisition: 10.53%

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

It is based upon personnel costs actually incurred.

Does the amount in the contract line include R/E work?

Yes, 95 percent (all but \$80,000 of the total).

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

Describe and explain leverage source and confirmation of funds:

Leverage estimates are estimates only. We anticipate approximately \$400,000 in NRCS funding and \$50,000 in USFWS funding. I also hope to secure federal funds for our projects in the Lake Superior basin.

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 dozen projects is a stand alone project. Administrative costs are based upon actual hours of staff time (personnel) and travel. Unused dollars budgeted for personnel and travel is poured back into doing additional habitat work (length, etc.).

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	72	72
Enhance	0	0	0	203	203
Total	0	0	0	275	275

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	\$540,000	\$540,000
Enhance	\$0	\$0	\$0	\$3,210,000	\$3,210,000
Total	\$0	\$0	\$0	\$3,750,000	\$3,750,000

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	36	0	0	0	36	72
Enhance	12	0	117	0	74	203
Total	48	0	117	0	110	275

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	\$270,000	\$0	\$0	\$0	\$270,000	\$540,000
Enhance	\$316,000	\$0	\$2,156,000	\$0	\$738,000	\$3,210,000
Total	\$586,000	\$0	\$2,156,000	\$0	\$1,008,000	\$3,750,000

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	\$7,500
Enhance	\$0	\$0	\$0	\$15,813

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	\$7,500	\$0	\$0	\$0	\$7,500
Enhance	\$26,333	\$0	\$18,427	\$0	\$9,973

Target Lake/Stream/River Feet or Miles

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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.

Parcel List

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

Project sites are selected from among a list of high priority candidate stream segments suggested to us by DNR Fisheries Area managers, based upon their familiarity with the coldwater resources in their local area. MNTU filters the list to focus only in those watersheds likely to continue to support viable, fishable populations of naturally reproducing trout or 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 members' extensive knowledge of the watersheds, MNDNR management plans and surveys, other conservation planning efforts, consultations with MNDNR, and science based criteria. All things being equal, we consider the potential to draw new anglers, increase public awareness and support for OHF projects, and engage landowners in conservation.

Parcels to be protected in Pine County with trout stream conservation easements are confined to the four best remaining native brook trout streams. We are targeting key gaps in existing stream easements or other public ownership. These will also provide access for any habitat restoration and enhancement needed. Parcels will be selected based upon their importance for preserving riparian and in-stream habitat and connecting habitat above and/or below it.

Parcels near Duluth are focused on the best, coldest brook trout streams. These top streams are either completely unprotected or have just a few segments protected. Parcels will be selected based upon their importance for preserving riparian and in-stream habitat and connecting good habitat above and/or below

Section 1 - Restore / Enhance Parcel List

Dakota

Name	TRDS	Acres	Est Cost	Existing Protection?
Trout Brook	11317226	7	\$0	Yes

Fillmore

Name	TRDS	Acres	Est Cost	Existing Protection?
Mill Creek	10511231	7	\$0	Yes
Rice Creek	10411223	11	\$0	Yes
Torkelson Creek	10410225	11	\$0	Yes

Houston

Name	TRDS	Acres	Est Cost	Existing Protection?
Beaver Creek	10207224	7	\$0	Yes

Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
Manitou River	05806217	5	\$0	Yes
Split Rock River	05408206	6	\$0	Yes

Pine

Name	TRDS	Acres	Est Cost	Existing Protection?
Hay Creek	04118232	5	\$0	Yes

St. Louis

Name	TRDS	Acres	Est Cost	Existing Protection?
Keene Creek	05015236	3	\$0	Yes

Wabasha

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

Winona

Name	TRDS	Acres	Est Cost	Existing Protection?
Cedar Valley Creek	10606232	7	\$0	Yes
Pine Creek (New Hartford Creek)	10505219	7	\$0	Yes

Section 2 - Protect Parcel List

Pine

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Hay Creek	04018208	36	\$0	No	Not Applicable	Full

St. Louis

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
White Pine River	05016217	36	\$0	No	Not Applicable	Full

Section 2a - Protect Parcel with Bldgs

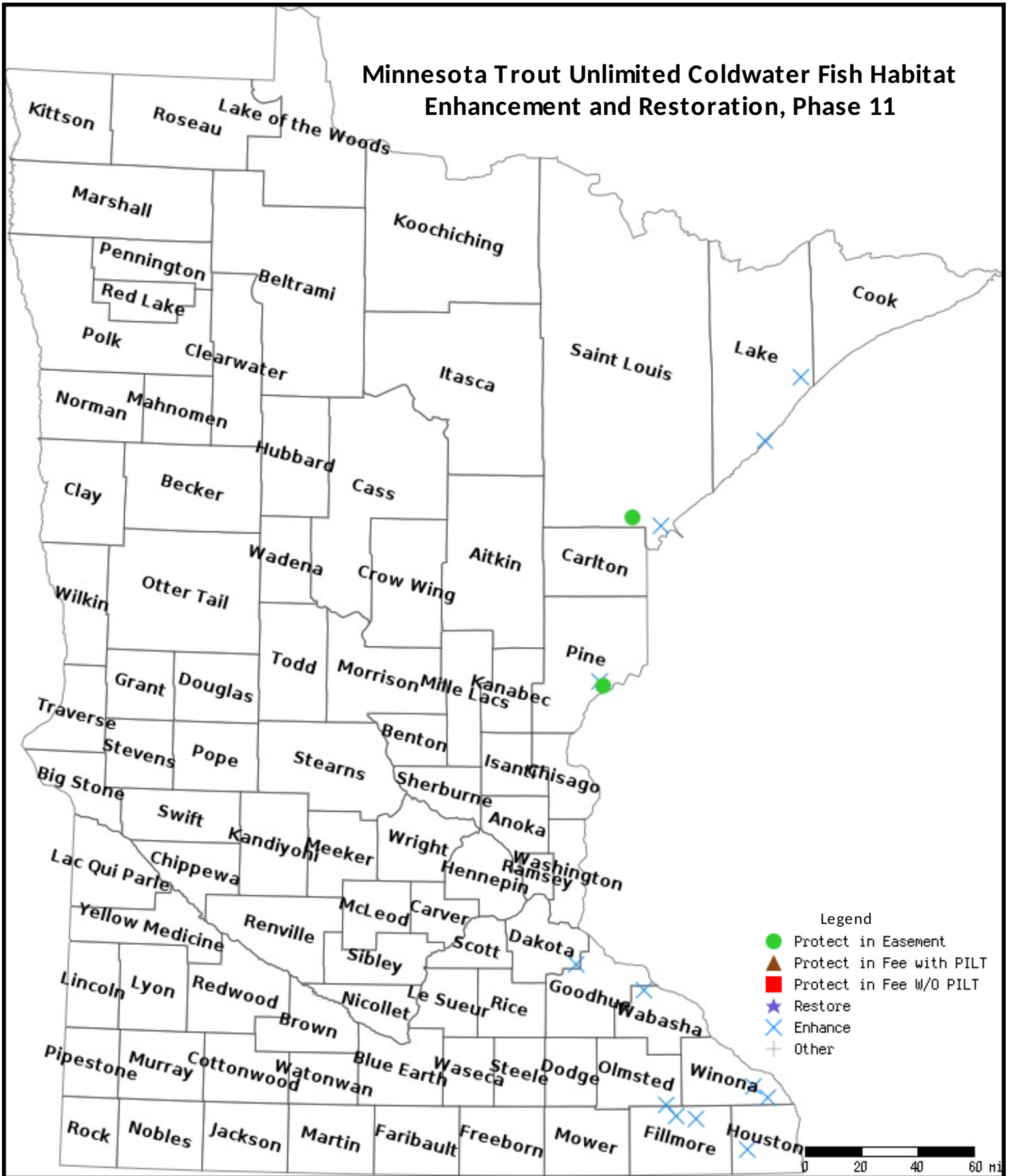
No parcels with an activity type protect and has buildings.

Section 3 - Other Parcel Activity

No parcels with an other activity type.

Parcel Map

Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 11



Data Generated From Parcel List



After



Before



This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY2020 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.

Metro Urbanizing Section

1. Trout Brook (Dakota)

Trout Brook is a rare wild brook trout stream located in southern Dakota County. It is among a handful of streams in the Twin Cities metropolitan area which still support fishable trout populations, and is the only remaining brook trout fishery in Dakota County. The 3,000 foot long reach of stream which MNTU restored with OHF funding is drawing many anglers and rave reviews. The restored section was full of spawning

brook trout last fall, and the population should soar now that cover habitat has been increased. The proposed project picks up at the downstream end of that completed restoration and will enhance habitat along another 3,000 feet of stream.

Trout Brook flows into the Cannon River east of Hwy 52 and south of the town of Meisville, Minnesota. Much of the watershed is protected by a large county park and conservation easements on adjacent private lands. Several springs ensure cold water, yet much of the in-stream habitat has been badly degraded.

We will enhance in-stream and riparian habitat along a 3,000 foot segment extending downstream from the previously enhanced segment. We will continue our partnership with Dakota County and the MNDNR. This project will expand quality coldwater angling opportunities within a 15 to 60 minute drive of most metro area residents.

2. Hay Creek (Pine)

Pine County, just to the north of the metro suburbs, is home to more than twenty native brook trout streams which are now in very degraded, unproductive condition. These are the closest trout fisheries on the northern side of the metro area and once were a popular destination for trout anglers. Sadly these small streams have suffered from neglect, especially in riparian forest management. While many still have cold springs, loss of mature forest canopy, primarily coniferous, has allowed alders to dominate riparian corridors and alter in-stream habitat.

Dense corridors of alders in the sandy soils found here are altering stream channels and causing stability issues. Alders routinely break away from the banks and slowly fall into the streams. This slows the water and causes sand to gradually fill the stream channel. Over time the sand choked stream channels become wider and shallower. The alder and aspen lined streams, formerly dominated by conifers, now attract unnaturally high numbers of beavers which dam the streams. This leads to further sediment build up and warmer water. Increased stream temperatures, buried spawning gravels and lack of cover habitat lead to loss of trout populations. Many streams no longer support a native brook trout fishery.

A. Habitat restoration: This project will begin restoration of in-stream and riparian habitat through removal of streamside alders and incorporating them into brush bundles placed in the stream channel to narrow and deepen it. This will flush sand, re-exposing substrates for food production and spawning, and boost trout numbers. The riparian forests will be restored by planting conifers and other long lived tree species which are not attractive to beaver. Cover logs will be placed in select locations. Work will primarily use hand labor, including by Conservation Corps crews.

We will work closely with the Hinckley Area Fisheries Office to verify the best reach within the Hay Creek watershed to begin restoring quality wild trout populations a short drive from north metro residents.

B. Protection of stream corridors, including to facilitate more restoration:

Hay Creek, Little Hay Creek, Sand Creek and Crooked Creek contain the best remaining habitat and native trout populations in Pine County. All of them need habitat enhancement/restoration and protection of key riparian corridors. Trout stream conservation easements are needed in many stretches both to protect riparian corridors and to allow enhancement/restoration of in-stream and riparian forest habitat. We will work closely with the Hinckley Area Fisheries Office to prioritize the acquisition of key gaps in riparian corridors on the best streams in order to improve and ensure the long term persistence of our legacy of native brook trout fisheries in this unique sand country.

Southeast Forest Section (Driftless area)

The seven projects in southeast Minnesota described below share a legacy of degraded habitat due to agricultural practices of the past century. The following example is typical of how and why MNTU improves habitat along trout streams in this ecological region:

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, this reconnects the stream to its floodplain.

Eroding banks are sloped back to a more gradual 3 to 1 slope and the toe 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 a flood. 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 structures and undercut banks.

Overhead cover habitat is created both by increasing the stream's depth through via narrowing the channel or installing rock weir plunge pools, and by placing cover structures in select stream banks. These trees and wooden structures 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.

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.

3. Beaver Creek (Houston)

This project is near the popular Beaver Creek Valley State Park. The project site is a severely degraded segment of stream containing eroding stream banks and poor in-stream habitat. The habitat enhancement methods described in the agricultural area example above will be used. We will partner with the MNDNR Lanesboro Area Fisheries Office on implementation and will work with the landowner to leverage NRCS cost sharing funding to keep OHF costs to a minimum.

4. Cedar Valley Creek (Winona)

Cedar Valley Creek has a good supply of cold water and good gravel/cobble stream bed, but is overly wide and lacks deeper pool habitat essential for producing more and larger trout. The upper portion of the project site is plagued by invasive trees which are preventing beneficial sunlight from reaching the banks (to foster deep rooted grasses) and the stream bed to increase invertebrate production (i.e., fish food). We will enhance habitat in and along 3,000 feet or more of stream immediately upstream of habitat work we recently completed here.

5. Gilbert Creek (Wabasha)

Gilbert Creek is located on the edge of Lake City, MN and also an easy drive from the south and east suburbs. Gilbert Creek has cold water, good water quality and a wild brown trout, but a lack of a good habitat prevents a robust population. As a result, 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 able to access high quality angling.

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.

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 and spread out angling opportunities.

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, now open to year round trout angling.

7. Pine Creek (New Hartford Creek) (Winona)

The project site is a severely degraded segment of stream containing eroding stream banks and poor in-stream habitat. . Habitat will be enhanced using methods described above. We will partner with the MNDNR Lanesboro Area Fisheries Office on implementation and will work with the landowner to leverage NRCS cost sharing funding to keep OHF costs to a minimum.

8. Rice Creek (Fillmore)

Rice Creek is located only 30 miles southeast of Rochester, MN, right off (and flowing under) Hwy 52. A major spring enters Rice Creek in the upper portion of the project reach and keeps the creek cold in the hottest summers. Although the reach has good water temperatures, poor in-stream habitat and steep eroding banks are limiting the trout population. We will use the habitat enhancement methods described in the agricultural area example above (sloping back and seeding stream banks, reconnecting access to the floodplain, deepening the stream, placing in-stream cover habitat, etc.) to improve 4,900 feet of stream. There is also potential to work with the landowner to leverage NRCS cost sharing funding.

9. Torkelson Creek (Fillmore)

This project will benefit from this small watershed being selected as a focus area for implementation of the Root River Watershed One Watershed One Plan. We will enhance trout habitat on the bottom 4,800 feet of this stream from its confluence with the Root River upstream. The boost in trout abundance from the habitat enhancement will be further improved as upland work is completed by multiple agencies and partners.

The lower section 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. We'll continue upstream addressing high eroding banks, improving connection of the stream to its natural flood plain and adding cover habitat where needed.

Northern Forest Section

10. Split Rock River (Lake)

This stream supports brook trout and a very popular steelhead fishery, and the project site is a key nursery area for naturally reproduced juvenile steelhead. The project reach is located in the lower half mile of river before it enters Lake Superior. The stream channel is braided in numerous locations in this reach, reducing the amount of deep holding and overwintering water and increasing summer water temperatures. The channel will be restored to a single channel, eroding banks stabilized and habitat cover added. The completed project will increase habitat for brook trout and juvenile steelhead and help sustain these popular wild fisheries.

11. Manitou River (Lake)

The Manitou River is among the top handful of wild brook trout fishery along the North Shore. Despite this, many stretches are overly wide and warming due to historic logging practices which altered riparian forests. Human disturbance has caused alder and aspen to replace long lived conifers. The persistent problems which this change in vegetation causes for trout and trout stream habitat is discussed in the section above on Hay Creek (Pine County). Intervention to restore riparian forests to long lived tree species unattractive to beaver is essential to stream habitat and health. We will cut dense alder thickets, plant long lived tree species to provide shade and restore large woody cover habitat to the stream channel. Work will primarily use hand labor, including by Conservation Corps crews.

12. 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 another segment of the stream channel, increase the amount of deep pool habitat and

trout cover, connect good habitat and bolster the size and long term 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. 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. Recent OHF funding is currently being used to enhance habitat in the most badly degraded habitat in the Hermantown portion of the stream where most groundwater and natural reproduction was found, as well as a third segment of river located below Skyline Drive in parkland owned by the City of Duluth. We propose to enhance the last remaining 1,200 foot long segment in Hermantown.

In addition to stabilizing the channel, the project will directly increase the amount of overhead cover using large logs and boulders, using approaches similar to those employed on MNTU's Sucker River and Stewart River projects.

The corridor presently contains a large number of ash trees which are likely to succumb to emerald ash borer soon. By planting a mix of larger potted and bare root trees the project will quickly provide a second story of trees capable of providing shade as ash trees die off. Like other North Shore rivers, Keene Creek has significantly less cold groundwater than southeast Minnesota and stays cold in large part due to shading. Human alterations of the watershed cause Keene Creek to experience higher water temperatures in the summer, increasing the importance of shading. We will increase shade cover by planting a mixture of long lived tree species within the riparian corridor.

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.

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

13. Protection of Duluth area streams (St. Louis)

Amazingly, some of the highest quality, most productive, brook trout fisheries within 25 miles of Duluth, MN have no or very few permanently protected stretches. As development pressures increase, so does the risk of careless alterations of riparian areas which can severely damage currently robust wild trout fisheries. This project is essential to provide the permanent riparian corridor protection essential to maintaining high quality, self-sustaining trout fisheries near Duluth. A lack of permanent trout stream easements also prevents the undertaking of habitat enhancement in select

reaches or riparian plantings to address disease outbreaks and adapt to a changing climate.

The pressing need for trout stream conservation easements in northeast Minnesota far outstrips available funding. This need will not go away, unless the streams are destroyed first. Some of our best fisheries are completely unprotected. We will work with the Duluth Area Fisheries Supervisor to identify the highest priority reaches to protect on those streams we agree are the most likely to sustain quality brook trout fisheries even under likely climate change scenarios.

Statewide

14. 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 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 vegetative treatment is being prepared by the DNR with input from Minnesota Trout Unlimited. 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, controlled burns, and herbicide applications. Efforts to restore healthier riparian forests in 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, 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 LSOHJC staff approval.