

Lessard-Sams Outdoor Heritage Council

Fiscal Year 2021 / ML 2020 Request for Funding



Date: May 31, 2019

Program or Project Title: Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 12

Funds Requested: \$2,210,000

Manager's Name: John Lenczewski

Organization: Minnesota Trout Unlimited

Address: P O Box 845

City: Chanhassen, MN 55317

Mobile Number: 612-670-1629

Email: jlenczewski@comcast.net

County Locations: Cook, Hubbard, Lake, and Olmsted.

Eco regions in which work will take place:

- Northern Forest
- Forest / Prairie Transition
- Southeast Forest

Activity types:

- Enhance

Priority resources addressed by activity:

- Forest
- 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. Outcomes will be maximized by improving the connectivity of habitat and fish and wildlife populations. Timely maintenance on old projects will ensure habitat outcomes continue for many years.

Design and scope of work:

Just 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 protect streams from future harm, past habitat degradation cannot be reversed without active enhancement or restoration. Minnesota Trout Unlimited ("MNTU") proposes to directly enhance or restore 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. Split Rock River (Lake);
2. Baptism River (Lake);
3. Manitou River (Lake);
4. Cook County Trout Stream Pilot (Cook);
5. Southeast MN streams (numerous counties);
6. Numerous streams on prioritized maintenance list (statewide).

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

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 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:

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 projects will directly enhance, restore and reconnect approximately 27 miles of trout streams and benefit a far larger number of miles of these trout waters.

Which LSOHC section priorities are addressed in this proposal:

Forest / Prairie Transition:

- Protect, enhance, and restore wild rice wetlands, shallow lakes, wetland/grassland complexes, aspen parklands, and shoreland that provide critical habitat for game and nongame wildlife

Northern Forest:

- Protect shoreland and restore or enhance critical habitat on wild rice lakes, shallow lakes, cold water lakes, streams and rivers, and spawning areas

Southeast Forest:

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

Describe how your program will produce and demonstrate a significant and permanent conservation legacy and/or outcomes for fish, game, and wildlife as indicated in the LSOHC priorities:

We will directly restore or enhance critical habitat for fish, game, and nongame wildlife on key segments of coldwater streams and rivers around the state. The projects will restore or enhance habitat in and along 27 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 connected 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 highly valued 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 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 have significant impacts on 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 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. A portion of an appropriation would be used to maintain or repair past projects to ensure continuing habitat benefits.

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.

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 forest-prairie transition 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.*

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 well established, major maintenance work is not typically 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 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, 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
One year after the 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.

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. 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 long-term sustainability of these rare wild fisheries for future generations to enjoy. Timely maintenance now on older projects will extend maximum habitat outcomes well into the future.

Does this program include leverage in funds:

Yes

We will leverage private funding of TU, which TU 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 or other funding, including for fish passage/culvert replacement work in the Lake Superior basin.

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:

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

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, Public Waters, State Forests, State Park)**

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**

Accomplishment Timeline

Activity	Approximate Date Completed
Beginning planning, design and implementation of habitat enhancements	July 2020
Complete implementation of habitat enhancements, including tree and vegetation work	June 2025

Budget Spreadsheet

Total Amount of Request: \$2,210,000

Budget and Cash Leverage

BudgetName	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$130,000	\$0		\$130,000
Contracts	\$1,227,000	\$100,000	USFS, USFWS, and other partners	\$1,327,000
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	\$230,000	\$0		\$230,000
Direct Support Services	\$30,000	\$30,000	TU	\$60,000
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$3,000	\$0		\$3,000
Supplies/Materials	\$570,000	\$100,000	USFS, USFWS, and other partners	\$670,000
DNR IDP	\$0	\$0		\$0
Total	\$2,210,000	\$230,000		\$2,440,000

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Enhancement staff	0.50	5.00	\$130,000	\$0		\$130,000
Total	0.50	5.00	\$130,000	\$0		\$130,000

Amount of Request: \$2,210,000
 Amount of Leverage: \$230,000
 Leverage as a percent of the Request: 10.41%
 DSS + Personnel: \$160,000
 As a % of the total request: 7.24%
 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 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, including heavy equipment use and labor, on enhancement projects.

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 hope to secure approximately \$200,000 from federal sources to assist with the fish passage barrier removal/culvert replacement work in northeast Minnesota.

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. Any 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	0	0
Enhance	0	0	0	333	333
Total	0	0	0	333	333

Table 2. Total Requested Funding by Resource Type

Type	Wetlands	Prairies	Forest	Habitats	Total
Restore	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$2,210,000	\$2,210,000
Total	\$0	\$0	\$0	\$2,210,000	\$2,210,000

Table 3. Acres within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	0	0	0	0	0	0
Protect in Fee with State PILT Liability	0	0	0	0	0	0
Protect in Fee W/O State PILT Liability	0	0	0	0	0	0
Protect in Easement	0	0	0	0	0	0
Enhance	0	0	156	0	177	333
Total	0	0	156	0	177	333

Table 4. Total Requested Funding within each Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest	Total
Restore	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$745,000	\$0	\$1,465,000	\$2,210,000
Total	\$0	\$0	\$745,000	\$0	\$1,465,000	\$2,210,000

Table 5. Average Cost per Acre by Resource Type

Type	Wetlands	Prairies	Forest	Habitats
Restore	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$0	\$6,637

Table 6. Average Cost per Acre by Ecological Section

Type	Metro/Urban	Forest/Prairie	SE Forest	Prairie	Northern Forest
Restore	\$0	\$0	\$0	\$0	\$0
Protect in Fee with State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Fee W/O State PILT Liability	\$0	\$0	\$0	\$0	\$0
Protect in Easement	\$0	\$0	\$0	\$0	\$0
Enhance	\$0	\$0	\$4,776	\$0	\$8,277

Automatic system calculation / not entered by managers

Target Lake/Stream/River Feet or Miles

27.7 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.

Parcel List

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

MNTU focuses habitat enhancement effort 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.

Section 1 - Restore / Enhance Parcel List

Cook

Name	TRDS	Acres	Est Cost	Existing Protection?
Cook County Pilot Stream	06003209	5	\$0	Yes

Hubbard

Name	TRDS	Acres	Est Cost	Existing Protection?
Statewide maintenance (prioritized)	14333212	0	\$0	Yes

Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
Baptism River	05809212	120	\$0	Yes
Manitou River	05907236	10	\$0	Yes
Split Rock River	05409227	6	\$0	Yes

Olmsted

Name	TRDS	Acres	Est Cost	Existing Protection?
Southeast Maintenance and Additional Enhancements	10711226	120	\$0	Yes

Section 2 - Protect Parcel List

No parcels with an activity type protect.

Section 2a - Protect Parcel with Bldgs

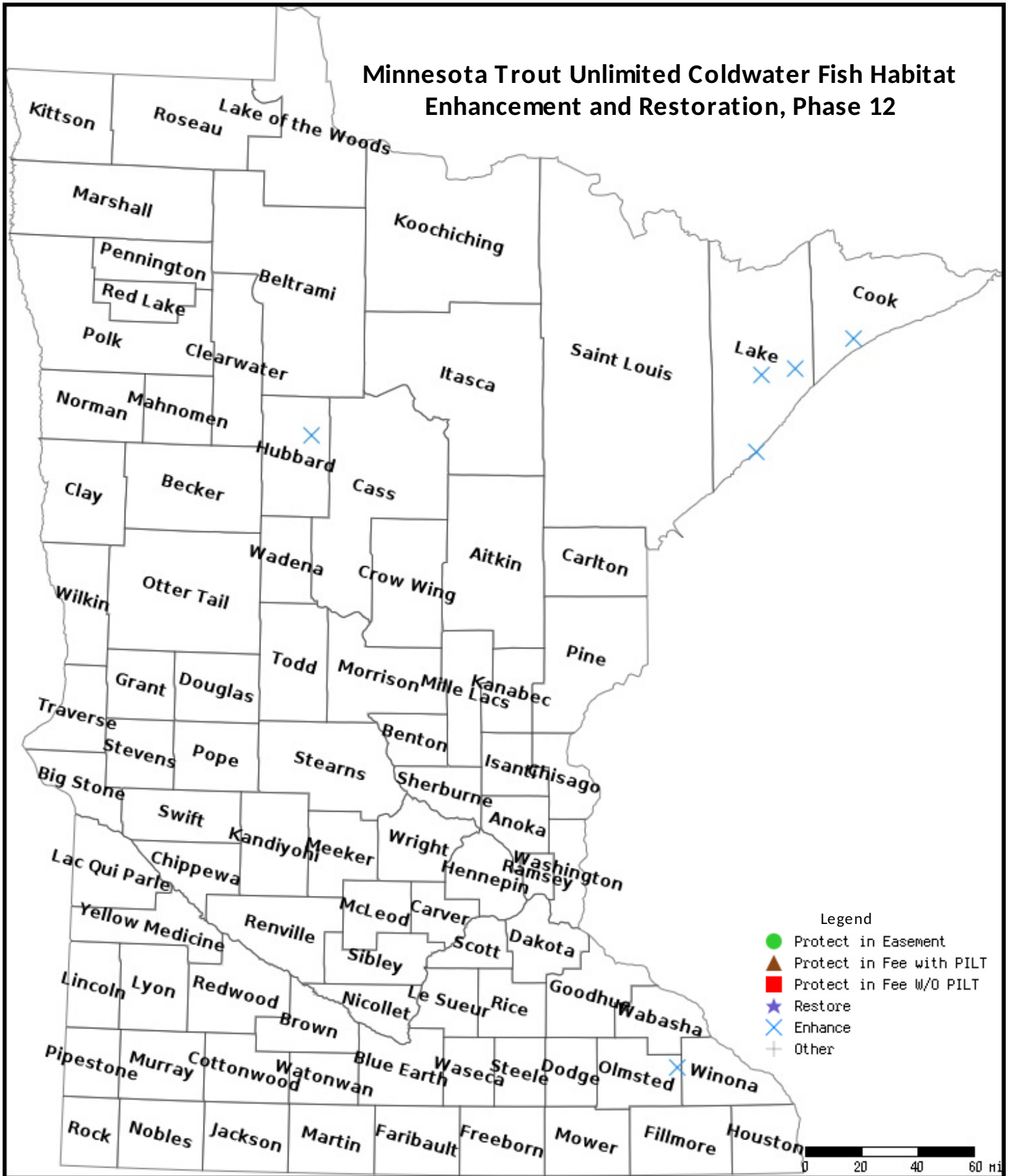
No parcels with an activity type protect and has buildings.

Section 3 - Other Parcel Activity

No parcels with an other activity type.

Parcel Map

Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 12



Data Generated From Parcel List

MNTU Coldwater Fish Habitat Enhancement and Restoration, Phase 12

Enhanced Northern
Brook Trout Stream



Enhanced Southeast
Trout Habitat



This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY2021 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. Split Rock River (Lake)

This river supports both brook trout and a very popular steelhead fishery. The project site is used by coaster brook trout and 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 river 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 (coaster) brook trout and juvenile steelhead and help sustain and increase these very popular wild fisheries. Design and permitting work is already funded with a FY2020 appropriation. We are now seeking the construction funding.

2. Baptism River (Lake)

The Baptism River is a top tier coldwater fishery which enters Lake Superior in Tettegouche State Park near Finland, Minnesota. Several years ago, MNTU spearheaded a collaborate planning process with the MNDNR, conservation and sporting groups, and other agencies to identify the top tier of North Shore watersheds on which to focus future protection, restoration and enhancement actions. Consensus was reached on the top tier watersheds in the Lake Superior basin. The Baptism River was identified as a top tier watershed. In addition to supporting a robust steelhead fishery below barrier waterfalls in Tettegouche State Park, the extensive upper watershed holds good native brook trout populations scattered among various tributaries and mainstream branches.

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 find cold water during dry and/or hot summer conditions, to spawning areas in the fall and to deeper habitat for wintering. Perched and collapsed culverts act as dams, blocking access to essential habitat at key times. This loss of "habitat connectivity" and fragmentation is one of the greatest threats to sustaining wild brook trout populations. Research indicates that the size and impact of this threat will continue to grow as climate and water temperatures warm.

We propose to work with DNR Fisheries, the local Soil & Water Conservation District, local highway departments, and other partners to replace up to ten of the worst culverts blocking brook trout passage. Lake County previously conducted a survey of culverts in the watershed and DNR Fisheries is in the process of ground truthing the list to determine which culverts are having the largest negative impact upon the trout fishery. We will use their results for planning meetings with DNR, highway authorities, SWCD staff and other partners to identify those of the worst which partners are willing to collaborate, or at least cooperative, to replace. The number of miles of useable 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 otherwise productive trout habitat will be reconnected.

3. Manitou River (Lake)

The Manitou River is among the top handful of wild brook trout fisheries 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.

This change in riparian vegetation causes persistent problems for trout and trout stream habitat. The alder and aspen lined streams, formerly dominated by conifers, now attract unnaturally high numbers of beavers which dam the streams. This leads to sediment build up and warmer water. Increased stream temperatures, buried spawning gravels and lack of large cover habitat lead to reduced trout populations. In some cases, perennial dams can block movement of brook trout to spawning areas or to thermal refuge areas in summer or winter.

This project will accelerate restoration of in-stream and riparian habitat in this targeted watershed through removal of streamside alders, aspen and ash (site preparation). We will plant of conifers and other long-lived tree species which are not attractive to beaver to provide shade and restore the cycle of gradual recruitment of large woody habitat to the stream channel. Cover logs will be placed in the channel in select locations. Work will primarily use hand labor, including by Conservation Corps crews. Habitat will be enhanced along a mile or more of stream. This intervention to restore riparian forests to long lived tree species unattractive to beaver is essential to sustaining stream habitat and health into the future.

4. Cook County Trout Stream Pilot (Cook)

We propose to pilot a new approach to enhancing brook trout habitat working 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 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 is 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 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 two pilot project sites totaling at least 2,000 feet. We hope to demonstrate the efficiency of a new approach to improving trout habitat in forested areas of the state, which several entities could adopt.

Statewide

5. Maintenance and Additional Enhancement of Older Projects (numerous counties)

Rather than propose new projects in southeast Minnesota, we are requesting funding to conduct routine maintenance and habitat upgrades on past projects to ensure they continue to provide sustained habitat benefits well into the future. We completed 46 trout habitat projects enhancing 39.9 miles of streams and 6 lakes, together totaling 789 acres of habitat, using OHF funding from the now closed FY 2010 to FY 2013 grants. 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 some spot maintenance. Some need cutting or burning to control invasive trees or to boost native plants. A few need additional habitat inputs to increase their durability and performance.

The wisdom of a "roving habitat crew" to perform regular maintenance or repair on past stream habitat projects, including projects initially built with both OHF and other funding, has been 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 periodic vegetation management, regular flooding causes a host of other repair needs. However, we do not propose putting 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 some heavy equipment such as 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 other DNR funding and some limited TU funding. Developing a good system of inspection and swift repair has been stymied by procurement rules and the lack of a readily available funding source, even as the

number of completed projects grows. We have assumed OHF funds in open grants could not be used for maintenance on projects built using early grants. While we hope to find a mechanism for funding ongoing maintenance soon, the need for maintenance and repair of OHF projects completed 4 to 10 years ago is pressing. A modest investment now is a very cost-effective way of ensuring project sites continue to provide habitat outcomes for many years to come.

Consequently, we propose to develop maintenance and repair plans for all projects completed with FY2010 to FY2013 appropriations and perform as much work as a FY2021 appropriation will allow.

A list of the 46 habitat enhancement projects completed with funding from FY2010 to FY2013 appropriations is attached.

6. 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 predominantly vegetative treatment will be finalized 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 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

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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);

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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).