

Request for Funding

Lessard-Sams Outdoor Heritage Council Fiscal Year 2015 / ML 2014

Program or Project Title: Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement & Restoration

Funds Requested: \$2,600,000

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Organization Web Site: www.mntu.org

County Locations: Becker, Carlton, Cook, Dakota, Fillmore, Goodhue, Lake, and Wabasha.

Ecological Planning Regions:

- Northern Forest
- Southeast Forest
- Metro / Urban

Activity Type:

- Enhance

Priority Resources Addressed by Activity:

- Habitat

Abstract:

Minnesota Trout Unlimited and its volunteers, chapters and partners will directly enhance habitat for fish, game and wildlife in and along fourteen coldwater streams located on existing Aquatic Management Areas and other existing public lands around the state.

Design and Scope of Work:

The problem being addressed.

Minnesota's remaining coldwater streams are popular with anglers and valued by citizens because, while they represent just six percent of our total miles of streams and rivers, they are the highest quality aquatic systems remaining. Degraded habitat in and along coldwater streams is, therefore, a conservation issue of statewide importance that requires accelerated investment in projects which enhance or restore this habitat.

Minnesota Trout Unlimited ("MNTU") proposes to improve degraded habitat on fourteen priority streams located on existing AMAs and public land around the state. Our members have demonstrated the capacity to complete these projects with Fiscal Year 2015 funding from the Outdoor Heritage Fund ("OHF"). MNTU respectfully proposes to partner with the Lessard-Sams Outdoor Heritage Council and the citizens of Minnesota to enhance habitat in and along the following public waters (in these counties):

1. Spring Creek (Goodhue)

2. Vermillion River (Dakota)
3. Cold Spring Brook (Wabasha)
4. East Indian Creek (Wabasha)
5. Lost Creek (Fillmore)
6. Lynch Creek (Fillmore)
7. Spring Valley Creek (Fillmore)
8. Trout Run Creek (Fillmore)
9. Blackhoof River (Carlton)
10. French River (St. Louis)
11. Kadunce River (Cook)
12. Little Devil Track River (Cook)
13. Stewart River (Lake)
14. Straight River (Becker)

Individual project descriptions are provided in an attachment.

Goals and scope of work.

The goal of each project is 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. FY 2015 funded projects will use methods similar to those used on successful projects recently completed by MNTU chapters. MNTU will leverage our experience to optimize project design and implementation.

In consultation with professionals within the Minnesota Department of Natural Resources (“MNDNR”), MNTU will use 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.

Objectives: Projects will accomplish these objectives: (a) increase adult trout abundance, (b) reduce stream bank erosion and associated sedimentation downstream, (c) reconnect streams to their 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 angler access and participation, and (h) protect productive trout waters from invasive species.

Methods: 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, the number of larger trout, and levels of successful natural reproduction. Additional benefits, typically extending many miles downstream from the project, include reduced erosion and sedimentation, cooler water temperatures, improved water quality, and increased connectivity of aquatic and riparian habitat corridors.

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' extensive knowledge of the watersheds, MNDNR management plans and surveys, other habitat and conservation planning efforts, consultations with MNDNR professionals, and science based criteria. Some projects build upon previous work in neighboring segments to collectively boost the overall fishery, while others are the first project on a stream and can significantly boost spawning success by providing scarce cover for adult trout and improved spawning habitat. Some projects are in locales with limited opportunities for quality coldwater angling. All things being equal, we consider the potential to draw new anglers outdoors, increase public awareness of the threats facing coldwater fisheries and watersheds, engage local residents in conservation, foster partnerships, and increase public support for OHF projects.

Urgent conservation opportunities.

The targeted stream segments are no longer providing habitat or clean water benefits, angling opportunities, or other enticements which increase outdoor recreation and encourage public appreciation and stewardship of aquatic ecosystems. By creating productive fisheries in visible and accessible areas, these projects will increase citizens' use of our coldwater ecosystems, tangibly re-connect Minnesotans to the land and water, foster understanding of threats to them, and motivate citizens to advocate for watershed and water quality improvements. Without immediate action, Minnesota will lose these myriad benefits, as well as the substantial economic benefits the projects generate.

Stakeholder support.

We continue to receive strong support for these projects from landowners, rural communities (especially since most funding pays local contractors and suppliers for direct construction expenses), and local civic and sporting organizations. We will continue to gather local input and develop partnerships in the planning and implementation stages. Landowners typically become very enthusiastic partners, working side-by-side with TU volunteers, donating materials, and helping secure additional conservation funding.

Budget numbers are estimates only. Through construction efficiencies and leveraging substantial federal and private monies we expect to lengthen projects and even improve additional streams.

Planning

MN State-wide Conservation Plan Priorities:

- H2 Protect critical shoreland of streams and lakes
- H3 Improve connectivity and access to recreation
- H6 Protect and restore critical in-water habitat of lakes and streams
- H7 Keep water on the landscape

Plans Addressed:

- Driftless Area Restoration Effort
- Long Range Plan for Fisheries Management
- National Fish Habitat Action Plan
- Outdoor Heritage Fund: A 25 Year Framework
- State Comprehensive Outdoor Recreation Plan
- Strategic Plan for Coldwater Resources Management in Southeastern Minnesota
- Tomorrow's Habitat for the Wild and Rare
- Asian Carp Action Plan

LSOHC Statewide Priorities:

- Address Minnesota landscapes that have historical value to fish and wildlife, wildlife species of greatest conservation need, Minnesota County Biological Survey data, and rare, threatened and endangered species inventories in land and water decisions, as well as long-term or permanent solutions to aquatic invasive species

- Are ongoing, successful, transparent and accountable programs addressing actions and targets of one or more of the ecological sections
- Attempts to ensure conservation benefits are broadly distributed across the LSOHC sections
- Ensures activities for "protecting, restoring and enhancing" are coordinated among agencies, non profits and others while doing this important work; provides the most cost-effective use of financial resources; and where possible takes into consideration the value of local outreach, education, and community engagement to sustain project outcomes
- Leverage effort and/or other funds to supplement any OHF appropriation
- Produce multiple enduring conservation benefits
- Provide Minnesotans with greater public access to outdoor environments with hunting, fishing and other outdoor recreation opportunities
- Restore or enhance habitat on permanently protected land
- Use a science-based strategic planning and evaluation model to guide protection, restoration and enhancement, similar to the United States Fish and Wildlife Service's Strategic Habitat Conservation model

LSOHC Northern Forest Section Priorities:

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

LSOHC Metro Urban Section Priorities:

- Enhance and restore coldwater fisheries systems

LSOHC Southeast Forest Section Priorities:

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

Relationship to Other Constitutional Funds:

- No Relationships Listed

Accelerates or Supplements Current Efforts:

Each discrete project is an additional "stand alone" project which supplements the amount of habitat work which MNTU chapters have traditionally been able to complete. While our members and chapters have been planning, fundraising for and executing quality fish habitat restoration and enhancement projects around Minnesota for four decades, our partnership with the L-SOHC has dramatically increased the amount of degraded habitat we are restoring and enhancing for all Minnesotans.

While members play vital roles in planning, designing, overseeing, directing and providing manual labor on what are essentially construction projects, we must hire excavation contractors and purchase rock, lumber and other materials put into the project sites. The availability of funds to hire heavy equipment operators and purchase materials remains the limiting factor in the amount of habitat work we can complete. The knowledge, passion and commitment of our volunteers continue to increase, as does their successful acceleration of the pace of habitat improvement. To ensure we finish what we start, we have developed, and continue expanding, a pool of qualified external contractors and consultants to assist with critical tasks.

Sustainability and Maintenance:

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 at least several decades. The sloped streambanks allow floodwaters to quickly spread out into the re-connected floodplain and dissipate energy, reducing the destructive impact of a flood. Flood waters typically flatten grasses temporarily and do not damage the in-stream structures and undercut banks. A tenfold increase in trout populations and three fold increase in large trout are common following completion of a southeast Minnesota project, and these gains are sustainable 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 provide long-term monitoring and periodic labor.

Permanent Protection:

Is the activity on permanently protected land and/or public waters per MS 103G.005, Subd. 15? - Yes (WMA, AMA, County/Municipal, Public Waters, State Forests, National Forests)

Accomplishment Timeline

Activity	Approximate Date Completed
Begin project planning, design, and permitting work following a July 2014 appropriation	begin July 2014
Begin habitat enhancements during 2015 fieldwork season, following completion of design, permits and contracting.	2015 fieldwork season
Complete riparian and in-stream habitat enhancements.	October 2017
Cutting, burning and/or spot spraying vegetation to ensure grasses become well established.	Summers 2017 & 2018
Tree painting in riparian corridors of northern project sites in May-June following in-stream work	By June 2017

Outcomes

Programs in the northern forest region:

- Improved aquatic habitat indicators *Fish, macro invertebrate and substrate surveys*

Programs in metropolitan urbanizing region:

- A network of natural land and riparian habitats will connect corridors for wildlife and species in greatest conservation need *Connection to adjoining parcels*
- Improved aquatic habitat indicators *Fish, macro invertebrate and substrate surveys*

Programs in southeast forest region:

- Rivers, streams, and surrounding vegetation provide corridors of habitat *Fish, macro invertebrate and substrate surveys*

Budget Spreadsheet

Total Amount of Request: \$2,600,000

Budget and Cash Leverage

Budget Name	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$100,000	\$0		\$100,000
Contracts	\$1,315,000	\$70,000	SWCDs; Watershed JPO	\$1,385,000
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	\$22,000	\$0		\$22,000
Professional Services	\$484,000	\$100,000	SWCDs; Watershed JPO	\$584,000
Direct Support Services	\$0	\$0		\$0
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$0	\$0		\$0
Supplies/Materials	\$679,000	\$30,000	SWCD	\$709,000
DNR IDP	\$0	\$0		\$0
Total	\$2,600,000	\$200,000	-	\$2,800,000

Personnel

Position	FTE	Over # of years	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Program manager	0.40	2.00	\$60,000	\$0	-	\$60,000
Watershed director	0.10	2.00	\$10,000	\$0	-	\$10,000
Program assistant	0.25	2.00	\$30,000	\$0	-	\$30,000
Total	0.75	6.00	\$100,000	\$0	-	\$100,000

Output Tables

Table 1. 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	125	125
Total	0	0	0	125	125

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	\$2,600,000	\$2,600,000
Total	\$0	\$0	\$0	\$2,600,000	\$2,600,000

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	23	0	64	0	38	125
Total	23	0	64	0	38	125

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	\$210,000	\$0	\$1,800,000	\$0	\$590,000	\$2,600,000
Total	\$210,000	\$0	\$1,800,000	\$0	\$590,000	\$2,600,000

Table 5. Target Lake/Stream/River Miles

9 miles

Parcel List

Section 1 - Restore / Enhance Parcel List

Becker

Name	TRDS	Acres	Est Cost	Existing Protection?
Straight River	14036233	6	\$0	Yes

Carlton

Name	TRDS	Acres	Est Cost	Existing Protection?
Blackhoof River	04717222	6	\$0	Yes

Cook

Name	TRDS	Acres	Est Cost	Existing Protection?
Kadunce River	06102102	3	\$0	Yes
Little Devil Track River	06101107	3	\$0	yes

Dakota

Name	TRDS	Acres	Est Cost	Existing Protection?
Vermillion River	11420236	23	\$0	Yes

Fillmore

Name	TRDS	Acres	Est Cost	Existing Protection?
Lost Creek	10411218	6	\$0	Yes
Lynch Creek	10411211	15	\$0	Yes
Spring Valley Creek	10312218	12	\$0	Yes
Trout Run Creek	10410204	9	\$0	Yes

Goodhue

Name	TRDS	Acres	Est Cost	Existing Protection?
Spring Creek	11215207	7	\$0	yes

Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
French River	05112207	3	\$0	Yes
Stewart River	05310219	17	\$0	Yes

Wabasha

Name	TRDS	Acres	Est Cost	Existing Protection?
Cold Spring Brook	11013231	3	\$0	Yes
East Indian Creek	10909221	12	\$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.

Individual Project Descriptions - Minnesota Trout Unlimited - Fiscal Year 2015

This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY 2015 funding from the Outdoor Heritage Fund. Additional priority habitats projects may be completed depending upon funds leveraged and construction efficiencies realized. Actions to be performed, opportunities seized and partnerships being fostered are outlined. All projects will enhance and/or restore habitat on existing public property or land permanently protected by a conservation and management easement under the aquatic management area system. No acquisitions are involved.

Metro Urbanizing Section

1. Spring Creek (Goodhue)

This south metro stream hosts wild brook just a few miles south of the Dakota County border. The proposed project is located within the Peter Hoffman Spring Brook Valley WMA off of State Hwy 19 near Red Wing, MN. This 396 acre WMA is actively managed by MNDNR Wildlife and stewarded by Pheasants Forever. It boasts a variety of recreational opportunities, including hunting, trout fishing, bird watching, and mushroom gathering.

The project will enhance fish, game and wildlife habitat along approximately 3,100 feet of stream. The stream here has numerous unstable and eroding streambanks. Enhancement work will consist of sloping and stabilizing these banks and reconnecting the stream to its floodplain. The larger WMA will reap benefits for many game and nongame species. In-stream habitat will be added to boost the naturally reproducing brook trout population. Bank cover and improved pool depth will ensure that fish thrive here, providing quality angling opportunities close to the Twin Cities and Red Wing. MNTU and Twin Cities Chapter members expect to donate several hundred hours of labor to ensure the project's success. Most of the field work will be completed in 2015, but measures to reestablish prairie grasses will require work in subsequent years. We will partner with Pheasants Forever on the grassland habitat work.

2. Vermillion River (Dakota)

The Vermillion River is a unique urban trout fishery located in Dakota County within a half-hour drive of downtown St. Paul. This large river harbors a self-sustaining population of trophy-sized brown trout. The number of large trout per mile rivals any stream in the state, with some fish approaching 30 inches in length. Its close proximity the majority of the state's residents ensures significant use by anglers happy to find high quality angling in their backyard.

This project reach has been severely degraded by ditching and straightening. The river is still nearly straight here, in stark contrast to the meandering path in unaltered reaches nearby. The lack of bends results in a uniform channel with little depth or other cover which trout require to

thrive. Straightened river channels are unstable, and this channel shows signs of erosion in many places where the stream is attempting to return to a more meandered state. Unaided this process can take many decades, and will cause excessive erosion of many tons of soil. The resulting sedimentation will fill holes and smother spawning substrates for miles downstream.

Our partners, Dakota County, the City of Farmington, and the Vermillion River Watershed Joint Powers Organization, are targeting several straightened river reaches, but the most likely project site is located on South Creek in Farmington, MN. This reach provides key trout nursery areas and, with habitat enhancement work, has the potential for growing very large wild brown trout. We will restore roughly 2,900 feet of straightened channel to a more natural, stable pattern and create approximately 4,100 feet of good trout habitat in the process. The stream banks will be planted in native vegetation, and integrated into a restoration of wildlife habitat on the wider parcel. Since a new stream channel is being made, environmental review is lengthier and is likely to delay implementation until spring 2016.

This project builds upon the great habitat acquisition efforts of Dakota County being funded by OHF and county matching funds. We will restore habitat on land recently protected by Dakota County. A trail will be developed as part of a larger greenway project, but OHF funding will not be used for that complimentary effort. OHF funds will be used only for our habitat restoration work. Partners will cover design, permitting and oversight costs.

Southeast Forest Section (Driftless area)

The six priority streams in southeast Minnesota described below share a legacy of degraded habitat due to agricultural practices of the past century. This typical example illustrates how and why MNTU improves habitat along the coldwater streams in this unique 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, aquatic food production areas and trout 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 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, 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 narrowing the channel or installing rock weir plunge pools, and by placing cover structures in select stream banks. These 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 enhanced streams flow faster, deeper and cooler, and provide vital overhead cover.

3. Cold Spring Brook (Wabasha)

This stream is located on the edge of Zumbro Falls, MN and readily accessible off MN Hwy 60, which crosses it. This stream is fairly unique in the Zumbro River watershed and southeast Minnesota in that it provides very cold water temperatures in which brook trout thrive in a relatively large stream setting, while also supporting quality brown trout fishing in the lower reaches. Habitat will be enhanced on approximately 1,200 feet of this stream at the request of the MNDNR in order to capture the added benefits generated by completing the middle portion of a much longer, continuous corridor of improved habitat. This reach currently suffers from fairly typical pre-project conditions of tall, eroding stream banks and a smothering canopy of invasive, shallow rooted trees which do not secure the soil well. In-stream and riparian fish and wildlife habitat will be enhanced using methods described in the agricultural area example above. Work will include sloping and stabilizing stream banks, installing overhead cover for trout, and restoring appropriate vegetation to the riparian corridor. Landowners and residents in the Zumbro Falls area are looking forward to a top quality brook trout fishery being restored here. MNTU and the Hiawatha Chapter of TU are working with the Wabasha County SWCD and the Zumbro Watershed Project to ensure that this watershed will receive priority for the implementation of soil and water conservation practices which keep water on the land.

4. East Indian Creek (Wabasha)

Habitat for native brook trout will be enhanced on approximately one mile on the upper portion of this stream, which previously supported a very robust brook trout population. Portions of this reach have become overly wide and warm to levels less favorable to brook trout. Invasive, shallow rooted trees which do not secure the soil, but instead hampered food production, also need to be removed. In-stream and riparian fish and wildlife habitat will be enhanced using methods described in the agricultural area example above.

5. Lost Creek (Fillmore)

This project will enhance habitat on an important tributary of the Root River located near Chatfield, Minnesota. The project reach is significant as a trout spawning and nursery area and is important for wild trout production both here and in the Root River. In hot summer periods it also provides important cold water refuge for large trout which migrate from the warming river. Habitat will be enhanced using methods described in the agricultural area example above,

including sloping and stabilizing stream banks, installing overhead cover for trout, and restoring appropriate vegetation to the riparian corridor.

6. Lynch Creek (Fillmore)

Lynch Creek is a tributary of the Root River located southeast of Chatfield, MN. This roughly 6,600 feet long section of highly degraded habitat has been at the top of the MNDNR's list for habitat improvement work. Deep deposits of legacy sediments will need to be removed from the riparian corridor to reconnect the stream with its floodplain.

7. Spring Valley Creek (Fillmore)

Most of this approximately one mile reach of stream is choked by shallow rooted, invasive trees which are severely limiting macroinvertebrate production and trout abundance. In-stream conditions and riparian wildlife will benefit from removal of this detrimental canopy and a return of riparian grasses and beneficial sunlight. This project may be all the habitat work needed here, or could be the springboard for additional in-stream work on this stream.

8. Trout Run Creek (Fillmore)

Due to extensive habitat enhancement work completed by Trout Unlimited and the DNR, Trout Run Creek supports a high quality trout fishery which is drawing anglers from around Minnesota and the nation. However, excessive shading by invasive box elders in some reaches, including the project reach, is limiting aquatic food production and holding down trout production in these and adjoining reaches. This project will focus on removing this detrimental tree canopy and allowing adequate sunlight to reach the stream and trigger the food production cycle. Limited bank sloping to reconnect the stream to its floodplain will also be performed. This reach is dominated by long riffles. After the project is completed it will become a major source of food production and provide improved spawning and young trout habitat. Neighboring sections will greatly benefit from the work and increase the growing popularity of this Driftless area destination.

Northern Forest Section

9. Blackhoof River (Carlton)

The Blackhoof River hosts the best coldwater fisheries in the Nemadji River basin, and is located roughly 30 miles south of Duluth near Barnum, Minnesota. It is the closest fishable Lake Superior tributary for the vast majority of the state's residents, being the located at the southwest edge of the basin and just a few minutes from Interstate 35. In-stream habitat for native brook trout and wild populations of steelhead and migratory brown trout will be restored along approximately 2,600 feet of river and riparian forests restored to increase the productivity and long term resilience of the coldwater fisheries.

The Minnesota DNR and MNTU agree that this watershed is the highest priority for habitat restoration in the Nemadji basin.

Historic logging and land clearing activities altered flow patterns and increased peak discharges, and left many sections of the Blackhoof River with badly degraded habitat conditions, including: unstable stream banks; unstable slopes; excessive rates of erosion and sedimentation; an excessive bedload of sand; increased turbidity and elevated water temperatures; decreased amounts of deep pool habitat; a relative absence of stable woody cover logs; decreased amounts of exposed substrates; decreased food production; decreased amounts of gravel suitable for spawning and successful egg incubation; and a loss of forest functionality through conversion away from conifers. Coordinated improvements in forest management and land conservation efforts are underway which should reduce destructive peak flows, but substantial damage to stream banks and in-stream habitat has occurred which can only be addressed with on the ground habitat restoration.

The project will likely involve the placement of trees at the toe of a large slumping bank to stabilize the slope and provide woody in-stream cover and depth. Depending upon site conditions, large rock may also be used to direct and encourage the scouring of sand and other sediments. These actions should improve spawning habitat, increase pool depth and increase year round cover habitat for juvenile steelhead and adult brook trout. Slopes and disturbed areas will be planted with long lived tree species. Longer term benefits of these plantings include shading the water, stabilizing the stream channel, curbing erosion and sedimentation, and providing a source of future in-stream cover habitat as trees naturally recruit to the channel over time.

The project may further restoration of "coaster" brook trout. The MNDNR, Carlton County SWCD and others have taken action to increase fish passage throughout this watershed and no significant physical barriers to the migration to and from Lake Superior remain. The Blackhoof has the second largest number of miles of habitat accessible to fish from Lake Superior of any Minnesota tributary. We are pursuing federal funding for additional high priority restoration work here.

Assessment, site selection, initial survey work, design and permitting will begin following a July 2014 appropriation. In-stream work will begin in 2015, and tree planting in 2016. Trout Unlimited members will likely be joined by volunteers from other sporting and conservation organizations, and we will encourage local residents to participate.

10. French River (St. Louis)

This project will enhance habitat on roughly 1,500 feet of this important North Shore stream to improve the resident brook trout fishery and increase the numbers of returning adult steelhead used for fry stocking on several North Shore rivers. This reach of the

French River serves as a nursery area for those fish which ultimately supply eggs for the MNDNR's steelhead fry stocking program. The returning adult steelhead, which survive two years as juveniles in this stream, provide the fry used for supplemental stocking on select North Shore rivers. Better habitat here will support more juvenile steelhead through a second winter to age 2, the size which research shows are large enough to survive Lake Superior and return as mature steelhead. The increased numbers of age 2 juveniles produced by the improved habitat will in turn increase the numbers of fry available for bolstering runs on several popular steelhead rivers.

An artificial impoundment which had caused excessive warming of the river was recently removed. MNTU volunteers and the DNR have planted 4,000 trees here to shade the new channel and further lower water temperatures. Water temperatures are now more favorable for native brook trout and juvenile steelhead, and this is an opportune time to improve physical habitat to increase productivity.

Early logging removed large cover logs and boulders from the stream channel and left an unstable channel, which exacerbated the effect of the historically severe flooding which occurred in June 2012. Channel stabilization and restoration is planned by the South St. Louis County Soil and Water Conservation District, which presents a great opportunity to partner with them to add a habitat focus and leverage habitat dollars to ensure that trout habitat enhancement opportunities are maximized. With the help of MNDNR fisheries biologists and fluvial geomorphologists, the project site(s) with the best potential for maximizing trout habitat gains will be selected. Since lack of deep pool habitat is a limiting factor for larger juvenile steelhead and adult brook trout, we will focus on creating deep pool habitat and overhead cover.

The project will use volunteers from the Gitche Gumee Chapter of TU (Duluth), MNTU, local angling and conservation groups, and local residents.

11. Kadunce River (Cook)

The Kadunce River supports a very popular and productive wild steelhead fishery located east of Grand Marais, Minnesota. Critical deep water cover habitat for juvenile steelhead, as well as coaster brook trout, will be enhanced to improve and sustain these fisheries, while simultaneously ensuring good fishing accessibility.

The old habitat structures which created the year-round deep water habitat and significantly bolstered this steelhead population have been damaged and degraded by time and strong floods. Numerous high water events have also revealed that modified designs are needed in this harsh setting. Consequently, existing in-stream wooden structures and rock weirs will be repaired or replaced to restore function and provide greater long term durability. Given tight working conditions in this scenic gorge, work

will be done primarily with hand labor and simple machines driven by chain saw engines and winches.

MNTU and the Gitche Gumee Chapter of TU will work alongside the MNDNR Grand Marais Area Fisheries Office, and will engage additional volunteers from the local area and from other sporting, conservation, and outdoor clubs. Conservation corps members may provide backup labor if needed. Fieldwork will take place in 2015 during the July to August low flow period.

The project will be highly visible, being located a stone's throw from a popular spur trail of and access point to the Superior Hiking Trail. A campsite for the Lake Superior Water Trail is also located at the downstream end of the project reach. The public will get to see OHF dollars being put to very good use improving habitat vital to fisheries which draw anglers from around the state.

12. Little Devil Track River (Cook)

Habitat for wild brook trout will be enhanced in this readily accessible stream located just outside of Grand Marais, Minnesota. The Little Devil Track River is the first stream crossed by the Gunflint Trail after it passing over the ridge overlooking Lake Superior and will provide an opportunity for the public to experience trout angling in a classic northern setting. Since in-stream cover was removed during the early logging and settlement era, efforts were made beginning more than 50 years ago to increase cover habitat for wild brook trout. Many of these habitat improvements were effective and this stream became a popular fishing destination for local and "down state" anglers alike. Unfortunately, many old habitat structures are now in very poor condition and no longer functioning properly, or at all. Better understandings of how in-stream structures function in this geologic setting have led to modified designs and methods over the past two or more decades, and old work sites can in many cases be enhanced or modified to provide much greater resource benefits. The MNDNR Grand Marais Area Fisheries Office recently inspected past habitat improvement sites and identified this site on the Little Devil Track River as a high priority for habitat enhancement work.

Working closely with DNR Fisheries personnel, TU and other volunteers will use hand labor to revitalize and replace failing wood and rock habitat structures, with conservation corps members providing back up labor if needed. Using improved understanding of how such structures function in the geologic and geomorphologic setting at this site, new structures will be placed so as to provide the deep water cover that larger adult brook trout need. Rock may be used direct both high and low stream flows appropriately. We anticipate engaging many local residents and volunteers from sporting, conservation, and outdoor education groups in summer 2015 fieldwork.

13. Stewart River (Lake)

The Stewart River, located outside two harbors, MN, is known for its productive and popular steelhead fishery. The project will increase the amount and quality of year-round cover habitat for juvenile steelhead, coaster brook trout and salmon along approximately 2,000 feet of river, and restore riparian forest along roughly one additional mile of river. The lack of large logs which provide cover, especially critical overwintering cover, for juvenile steelhead and other migratory trout and salmon is a significant problem most North Shore streams. This project will increase the amount of cover by restoring large logs and boulders to the stream channel in a key nursery stretch. Disturbed areas will be planted with native trees and riparian plants.

The relative absence of deep water and cover habitat utilized by juvenile salmonids is a limiting factor in providing a more productive, stable and resilient fishery. Early logging activities removed logjams, large woody debris and boulders from the stream channel, and altered the hydrology. Two or more logging cycles have resulted in a young forest ecosystem which is incapable of naturally replacing large logs for another 75 years or more. On top of this, severe flooding in June 2012 caused significant bank erosion. The precise project site will be carefully selected with MNDNR fisheries biologists.

The goal of the project is to directly increase the amount of deep pool habitat and overhead cover using large logs and rocks. Depending upon the site we hope to place approximately 75 large pine logs with intact root wads in the stream along with large rock. This will create direct cover for fish and wildlife, encourage channel complexity through scour and deposition, provide refugia for fish during flood events, and reduce the erosive power of storm flows.

We will also restore riparian forests by planting long lived tree species on one or more additional sites. By planting a mix of larger potted and bare root trees the project will quickly begin providing shade and help reduce summer water temperatures. Like other North Shore rivers, human alterations of the watershed cause the Stewart River to experience unnaturally high water temperatures in the summer. North Shore trout streams, unlike those in southeast Minnesota, lack significant groundwater flows and are kept cold by the shade provided by trees along their banks. Without cold water steelhead and trout will perish. This project component will increase shade cover by planting a mixture of long lived tree species, both coniferous and deciduous, within the riparian corridor. Due to rough terrain and accessibility little maintenance can be accomplished once MNTU volunteers and MCC crews have hauled trees in by hand and planted them. Consequently matting must be used to keep weed growth down, and the larger trees caged to inhibit deer browsing losses.

Tree plantings will remedy this pressing threat of elevated water temperatures relatively quickly, and help sustain the coldwater fisheries by providing many other benefits, including: stabilizing the stream channel, curbing erosion and sedimentation, providing a

source of future in-stream cover habitat as trees eventually recruit to channel, energy inputs via leaf litter to drive the food chain for juvenile trout and steelhead.

MNTU is launching a local outreach and education effort in the Stewart River watershed to engage residents in restoration, protection and conservation of the watershed and fisheries. This is being spearheaded by a trusted local conservationist who will spotlight the habitat projects and use them as a catalyst to get neighbors to adopt conservation practices throughout the watershed. The focus of the outreach effort is to keep more water on the land and slow the pace of runoff to the river. This public engagement initiative is being funded with separate Great Lakes funding. We hope that pairing it with good habitat work will make it a model of sustainable restoration and protection.

The project will involve collaboration between Minnesota Trout Unlimited, the MNDNR and the Lake County SWCD. Trout Unlimited members will volunteer substantial time and labor, along with volunteers from the Lake Superior Steelhead Association and other conservation groups. Site selection, initial survey work, site planning, design and permitting will begin following a July 2014 appropriation. Installation of woody cover, rock veining, and other fish habitat enhancement work will begin in 2015. Tree planting will take place in 2015 and/or 2016.

14. Straight River (Becker)

The Straight River, located near Park Rapids, Minnesota, has long been considered one of the 100 best trout streams in America. Declines in the trophy brown trout fishery in the 1980s led Minnesota Trout Unlimited to begin undertaking habitat projects with the MNDNR. In the past decade segments of this low gradient river have been very effectively restored using large trees to capture sediments and narrow the channel. The last project was completed in 2011 using Fy2010 OHF and MNTU funds. Recent population assessments have shown that this work is highly effective in increasing the numbers of large trout and bolstering natural reproduction. We propose to continue this partnership with the MNDNR and replicate this work on a wide, shallow reach that is approximately one-half mile in length and located several miles upriver.

Large conifers will be carefully installed in the channel of an excessively wide, straight stretch of this central Minnesota river to narrow and deepen the channel. Log structures, comprised of 3 or 4 whole trees each, will be installed in strategic locations to capture sediment and gradually narrow the channel, restore a more natural meander pattern, deepen the channel to create better fish habitat, and lower water temperatures. FY2015 OHF will cover approximately half the project costs. MNTU funds and other resources will cover the other half. We will work closely with the MNDNR and local landowners. Design and permitting work will begin in 2014 and fieldwork in summer 2015.