

# Lessard-Sams Outdoor Heritage Council

## Fiscal Year 2019 / ML 2018 Request for Funding



Date: June 15, 2017

Program or Project Title: Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 10 (HRE01)

Funds Requested: \$3,450,000

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

### Regions in which work will take place:

- Northern Forest
- Southeast Forest
- Metro / Urban

### Activity types:

- Protect in Easement
- Restore
- 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 Aquatic Management Areas and public lands around the state. Accelerating habitat work to reduce the backlog of degraded streams is urgent given the increasing threats to these scarce coldwater fisheries. Population outcomes will be maximized by improving the connectivity of habitat and fish and wildlife populations, and building upon earlier work on adjacent stream segments. Trout stream easements will be acquired in one priority watershed to facilitate this approach. These durable habitat improvements will create more productive, self-sustaining fisheries.

### Design and scope of work:

Just six percent of Minnesota's streams are capable of supporting any trout, and degraded habitat conditions severely limit the productivity of many of them. The riparian corridors of many streams are largely protected from future harm, but this cannot reverse past habitat degradation. Minnesota Trout Unlimited ("MNTU") proposes to directly restore or enhance degraded habitat on twelve or more 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. South Branch of Whitewater River (Winona);
2. Wisel Creek (Fillmore);
3. Winnebago Creek (Houston);
4. Beaver Creek (Houston);
5. Pine Creek (New Hartford Creek) (Winona);
6. Vermillion River (Dakota);
7. Keene Creek (St. Louis);

8. Miller Creek (St. Louis);
9. Stewart River (Lake);
10. Silver Creek (Lake);
11. Stoney Brook (Cass);
12. Numerous streams statewide (prioritized maintenance list).

We will protect via trout stream easements segments of the Stewart River which are the highest priority for habitat restoration or enhancement, to ensure access to strategically restore or enhance all priority segments within this watershed. The MNDNR will acquire and hold the easements.

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 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. 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 to receive 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:

- Not Listed

## 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 15 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 15 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 selected address this. 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 sustain cold stream flows. 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 into the future.

## 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:

- 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. 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 grant ends	MNTU volunteers or part of regular agency visit	Inspect structural elements and vegetation	Alert DNR and develop actions needed	Conduct maintenance with volunteers or contractors if DNR does not.
Every 3 years thereafter	MNTU volunteers or agency	Inspect structural elements and vegetation	Develop action plan with DNR if needed.	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. These 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 existing degraded conditions without 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 \$200,000). Our partner on the Miller Creek project in Duluth believes it will secure approximately \$400,000 in federal funding for this project. It is also likely that we will leverage USFWS grants on several projects. 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.

**Relationship to other funds:**

- Not Listed

**Describe the relationship of the funds:**

Not Listed

**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	0

**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)**

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**

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

Open to angling.

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, design work and permitting following a July 2018 appropriation	Begin July 2018
Begin habitat enhancements during the 2019 filed work season.	2019 filed work season
Complete habitat enhancements, including establishment of desirable riparian vegetation.	June 2013

# Budget Spreadsheet

**Total Amount of Request: \$3,450,000**

## Budget and Cash Leverage

BudgetName	LSOHC Request	Anticipated Leverage	Leverage Source	Total
Personnel	\$120,000	\$0		\$120,000
Contracts	\$1,560,000	\$350,000	SWCD, NRCS, USFWS	\$1,910,000
Fee Acquisition w/ PILT	\$0	\$0		\$0
Fee Acquisition w/o PILT	\$0	\$0		\$0
Easement Acquisition	\$190,000	\$0		\$190,000
Easement Stewardship	\$20,000	\$0		\$20,000
Travel	\$10,000	\$0		\$10,000
Professional Services	\$540,000	\$0		\$540,000
Direct Support Services	\$24,000	\$24,000	TU	\$48,000
DNR Land Acquisition Costs	\$0	\$0		\$0
Capital Equipment	\$0	\$0		\$0
Other Equipment/Tools	\$20,000	\$0		\$20,000
Supplies/Materials	\$966,000	\$500,000	SWCD, NRCS, USFWS	\$1,466,000
DNR IDP	\$0	\$0		\$0
Total	\$3,450,000	\$874,000		\$4,324,000

## 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 assistant	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: \$3,450,000

Amount of Leverage: \$874,000

Leverage as a percent of the Request: 25.33%

DSS + Personnel: \$144,000

As a % of the total request: 4.17%

Easement Stewardship: \$20,000

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, 97 percent (all but \$40,000 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:**

Not Listed

**Describe and explain leverage source and confirmation of funds:**

Leverage estimates are estimates only. We anticipate approximately \$400,000 in federal funds via our partner, \$400,000 in NRCS funding, and \$50,000 in USFWS funding.

**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	73	73
Enhance	0	0	0	193	193
Total	0	0	0	266	266

**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	\$278,000	\$278,000
Enhance	\$0	\$0	\$0	\$3,172,000	\$3,172,000
Total	\$0	\$0	\$0	\$3,450,000	\$3,450,000

**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	73	73
Enhance	9	0	108	0	76	193
Total	9	0	108	0	149	266

**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	\$278,000	\$278,000
Enhance	\$398,000	\$0	\$1,674,000	\$0	\$1,100,000	\$3,172,000
Total	\$398,000	\$0	\$1,674,000	\$0	\$1,378,000	\$3,450,000

**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	\$3,808
Enhance	\$0	\$0	\$0	\$16,435



**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	\$3,808
Enhance	\$44,222	\$0	\$15,500	\$0	\$14,474

**Target Lake/Stream/River Feet or Miles**

15

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 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. 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.

Parcels in the Stewart River watershed to be protected and provide access for habitat restoration and enhancement will be selected based upon their importance for restoring habitat within the segment and connecting good habitat above and below it. The Stewart and Little Stewart rivers were walked to assess the condition of in-stream habitat and channel stability. Degraded segments needing habitat work were prioritized based on severity. Parcels already protected by public ownership or easements were removed from the list. To reduce the confounding effects of excessive sediment supply on project design and downstream habitat we plan to restore upstream segments of like severity first and then move downstream.

### Section 1 - Restore / Enhance Parcel List

#### Cass

Name	TRDS	Acres	Est Cost	Existing Protection?
Stoney Brook	13529208	12	\$0	

#### Dakota

Name	TRDS	Acres	Est Cost	Existing Protection?
Vermillion River	11420236	9	\$0	

#### Fillmore

Name	TRDS	Acres	Est Cost	Existing Protection?
Wisel Creek	10108206	9	\$0	

#### Houston

Name	TRDS	Acres	Est Cost	Existing Protection?
Beaver Creek	10207224	7	\$0	
Winnebago Creek	10105222	7	\$0	

#### Lake

Name	TRDS	Acres	Est Cost	Existing Protection?
Silver Ceek	05310216	2	\$0	

#### St. Louis

Name	TRDS	Acres	Est Cost	Existing Protection?
Keene Creek	04915212	5	\$0	
Miller Creek	05014218	9	\$0	

#### Winona

Name	TRDS	Acres	Est Cost	Existing Protection?
Pine Cr. (New Hartford Cr.)	10505219	7	\$0	
So Branch Whitewater River	10710214	18	\$0	Yes

### Section 2 - Protect Parcel List

## Lake

Name	TRDS	Acres	Est Cost	Existing Protection?	Hunting?	Fishing?
Stewart River	05311215	73	\$0			

### Section 2a - Protect Parcel with Bldgs

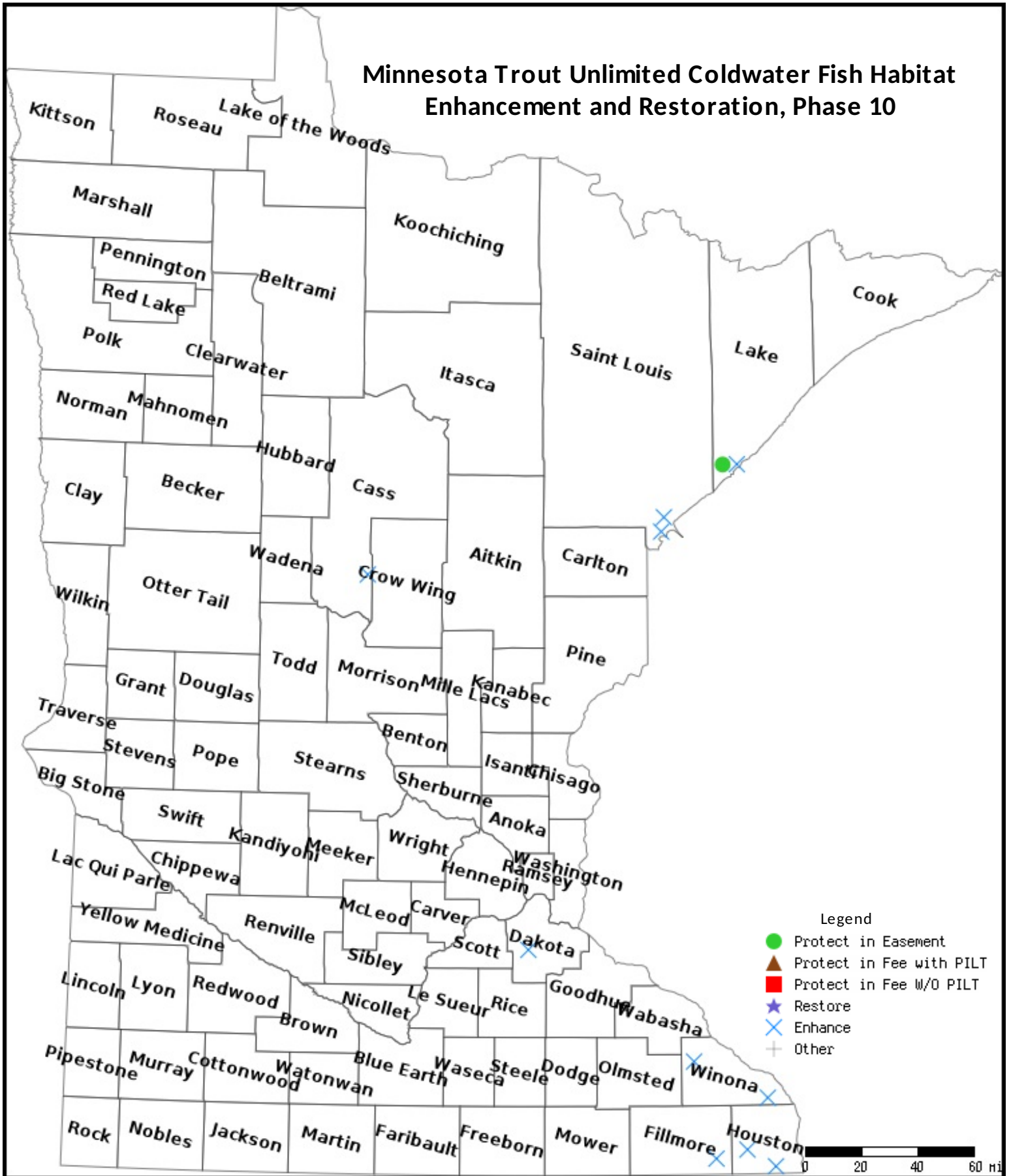
No parcels with an activity type protect and has buildings.

### Section 3 - Other Parcel Activity

No parcels with an other activity type.

# Parcel Map

## Minnesota Trout Unlimited Coldwater Fish Habitat Enhancement and Restoration, Phase 10



Data Generated From Parcel List

## Individual Project Descriptions - Minnesota Trout Unlimited - Fiscal Year 2019

This attachment briefly summarizes the priority habitat enhancement projects which Minnesota Trout Unlimited proposes to complete using FY2019 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.

### **Southeast Forest Section (Driftless area)**

The five 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.

#### 1. South Branch of Whitewater River (Winona)

The project reach was destabilized and habitat badly damaged as the result of August 2007 floods. In 2015 its trout population was nearly wiped out by a major fish kill. We will enhance habitat on 8,000 feet of this popular section. By providing good habitat and increased carrying capacity, the project will accelerate the recovery of the wild trout population. This is a highly visible, well used section of river. This is an opportunity both to do good habitat work and to demonstrate to anglers that their tax dollars are helping where they desperately want to see it used. This stream segment has been heavily silted and cluttered with downed trees and other woody debris. The proposed work will remove undesirable trees and brush, re-slope the banks, re-contour and stabilize the stream channel, and improve its connection to its natural flood plain. The work will improve trout holding and hiding cover in the project area.

#### 2. Wisel Creek (Fillmore)

Wisel Creek is an important fishery which enters into a high quality section of the South Fork of the Root River near Choice, MN. MNTU recently completed work on a tributary of Wisel Creek and is in the process of designing and implementing habitat improvements a 7,000' reach of Wisel downstream from the proposed Fy2019 project.

The new project site is located where several cold springs enter Wisel Creek. There is little quality habitat for adult trout. Habitat work here will provide good habitat in this coldwater refuge area and build upon the benefits of nearby work. It will make the overall trout population in the stream more resilient.

The habitat enhancement methods described in the agricultural area example above will be used. Trout habitat, trout populations, and trout angling will increase. Water quality benefits due to the reconnected floodplain and stabilized streambanks will be substantial. 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. The Hiawatha Chapter of TU will contribute substantial in-kind labor on the project

### 3. Winnebago Creek (Houston)

The project site near Caledonia, MN 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.

### 4. Beaver Creek (Houston)

The 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 trout 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.

### 5. Pine Creek (New Hartford Creek) (Winona)

This stream easily accessed from Interstate 90, ten miles west of La Crescent, MN. 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.

## **Metro Urbanizing Section**

### 6. 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 to 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.

The project reach is located on South Creek, which is the coldest Vermillion River tributary and a key trout nursery area. The habitat enhancement work will create good adult trout habitat, serve as a coldwater refuge for other reaches and has the potential for growing very large wild brown trout. We will restore approximately 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.

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 which will be protected by Dakota County prior to the effective date of a FY2019 appropriation. 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 on permanently protected land. Partners include Dakota County, the City of Farmington, and the Vermillion River Watershed Joint Powers Organization. The Twin Cities Chapter has turned out several hundred volunteers to work on Vermillion River project sites in the past 2 years, including many youth and nonmembers from the community. We expect that many will assist with planting and other work on this site as well.

## **Northern Forest Section**

### **7. 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



a third 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. It then tumbles down the hillside in a series of pools and runs before it enters the St Louis River near Grassy Point. This surprisingly productive stream is a short bicycle ride from thousands of homes and is popular with children and adults alike. It is arguably the most productive, fishable trout stream on the western half of Duluth and supports itself through good natural reproduction. The two most recent rounds of OHF funding are 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 is found. The FY2019 project will restore a third segment of river located in the next high priority reach moving downstream. The project reach is located below Skyline Drive in land owned by the City of Duluth. Trout habitat will be created throughout a 2,000 foot reach which flows through a well-used neighborhood parkway and will create great recreational opportunities for kids and families. MNDNR Duluth Area Fisheries Office agrees that this creek as a top priority for habitat work.

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

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

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

#### 8. Miller Creek (St. Louis)

Miller Creek is a native brook trout stream which runs through Hermantown and Duluth, Minnesota. This storied brook trout fishery is where countless young anglers cut their teeth on trout angling, including several well-known outdoor writers. In recent decades it has been impacted by development and the community has focused much effort at lowering water temperatures to improve trout survival and reproduction. Monitoring has verified that water temperatures in the project reach, located in the upper portion of the watershed, are suitable for sustaining naturally reproducing brook trout. However, this

section of the river was straightened in the past and the resulting lack of habitat is limiting trout abundance. This project will restore habitat and nearly double the stream length by restoring a natural meandering pattern along 4,000 feet of stream.

We will use natural channel design methodology to restore this channelized reach to a hydrologically stable channel that provides good trout habitat and is re-connected to its floodplain. Restoring the connection to the floodplain will also reduce erosion by slowing down stream velocities during high flows and increasing critical cool water baseflow. The riparian area will be planted with native trees and shrubs, hopefully with significant volunteer involvement by the community.

This highly visible project is a short hike or bike ride for thousands of kids and families.

This project will be done in partnership with the St. Louis County SWCD, and should leverage approximately \$400,000 to \$700,000 dollars in non-OHF funding. Partners are likely to include the cities of Hermantown and Duluth, the MN Pollution Control Agency, the MNDNR, the MN Dept. of Transportation, St. Louis County, and other entities that have taken steps to restore this urban trout fishery over the past several decades.

#### 9. Stewart River (Lake)

This project is vital to permit watershed scale restoration of the top priority North Shore watershed. The current lack of trout stream easements prevents strategic habitat restoration on those segments of the Stewart River which are most in need of restoration. Funding for the purchase price of trout stream easements is needed now to maintain momentum and achieve full restoration of this key watershed.

The Stewart River, located outside Two Harbors, MN, is known for its productive and popular wild steelhead fishery, as well as its brook trout fishing. MNTU has been spearheading 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 which watersheds are the top tier of the Lake Superior basin, and the Stewart River watershed ranks at the head of this select group. Preliminary results of a watershed assessment and master plan development confirm that most of the highest priority reaches for habitat restoration currently lack easements due to lack of adequate easement funding. This component of our habitat program will ensure key easements are secured and access for in-stream habitat restoration secured in a timely manner. MNTU members and partners will continue outreach to landowners to secure interest, but MNDNR will handle the purchase transactions and hold the easements.

This FY2019 project will enable enhancement and restoration work by MNTU and several partners by securing permanent conservation easements in the riparian corridor

of those parcels identified as the highest priority for fish habitat restoration and enhancement.

#### 10. Silver Creek (Lake)

This stream supports a popular steelhead fishery and the project site is important as a nursery area for juvenile steelhead. The project reach will improve habitat for juvenile steelhead as well as brook trout. The project site was impacted by the historically severe flood of June 2012. The channel is now very unstable and stability must be restored along with in-stream cover habitat. The channel will be restored, eroding banks stabilized using toe wood and woody cover, and further erosion and sediment inputs from the site reduced. A properly functioning, stable channel with depth and woody cover will provide habitat for steelhead, brook trout and other aquatic organisms, increase water quality and withstand high flows.

#### 11. Stoney Brook (Cass)

This small stream is a relatively rare, yet popular trout fishery in the Gull Lake area near Brainerd, MN. Habitat improvements done in the 1950s to 1980s need repair, modification or replacement. Habitat enhancement work will be concentrated in ten or so areas with a mile or more of stream. New habitat features will be added, increasing habitat for adult brook and brown trout. Work will primarily use hand labor provided by Conservation Corps crews under the direction of MNDNR Fisheries staff.

### **Statewide**

#### 12. 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 tree removal, brushing, tree

planting, 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.