Environment and Natural Resources Trust Fund
2019 Request for Proposals (RFP)

Project Title: **ENRTF ID: 214-F**

Innovative Strategies to Re-Introduce Wood into Driftless Area Streams

Category: F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat

Sub-Category:

Total Project Budget: $ 317,300

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

This project will install innovative large wood structures in a Driftless Area stream and identify scaling-up strategies. The site will be monitored for post-project and used for demonstration purposes.

Name: Christian Lenhart

Sponsoring Organization: The Nature Conservancy

Title: Restoration Ecologist

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Location

Region: Southeast

County Name: Fillmore

City / Township: Choice, Yucatan

Alternate Text for Visual:

The map shows the location of the experimental large wood reintroduction site in southeastern Minnesota

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____%
____ If under $200,000, waive presentation?			

PROJECT TITLE:
Innovative strategies to re-introduce wood into Driftless Area streams

I. PROJECT STATEMENT
The blufflands of Southeast MN are home to many trout streams. However, land-use impacts, flow increases and removal of wood from streams over the past century has created stream restoration challenges that persist today. The loss of large wood in streams via deforestation and snag removal has been detrimental to aquatic life as wood supports fish cover and pool habitat, depth variety and structure for invertebrates. A new state wildlife management area (WMA) near the town of Choice affords a unique opportunity to try new methods for re-establishing the ecological function of large wood jams and assessing their benefits. There is immense need to get more large wood into streams in a cost-effective manner and to restore the ecological functions large wood jams once provided. The WMA has 3.5 stream miles and 210 acres of floodplain that is being reforested, The Nature Conservancy's largest acquisition under its SE Minnesota Protection and Restoration Program. The large stream valley area reduces any concerns over flooding and instability from the placement of in-stream wood and offers opportunity for complementary floodplain restoration which is ongoing.

The project will place two engineered wood jams, a practice not yet used widely in Minnesota, and a toewood structure, both techniques that add in-stream wood for improved aquatic life and bank protection in areas already determined by site analysis. The site will also serve as a demonstration site for stream restoration methods. It will also serve as a long-term research area to better understand the use and effects of woody material in streams at different levels of cost and engineering. Post-project assessment will be done from 2020 to 2022 with the University of Minnesota. Stream geomorphology and fish and invertebrate response to the restoration will be monitored and reach-wide in-stream wood surveys conducted. GIS analysis will be done to assess locations where in-stream wood could be cost- effectively placed over time to assess the potential for scaling up the use of engineered wood jams. If funded, this project will leverage Outdoor Heritage Funds and private funds used to purchase the land and restore floodplain forest.

II. PROJECT ACTIVITIES AND OUTCOMES
Activity 1: *Establishment of in-stream wood structures on the South Fork Root River at Choice WMA.*
Description: We will restore in-stream habitat within three different reaches using woody debris placement: via toewood and two engineered log jams in fall to winter 2019-2020. Conceptual plans and preliminary stream assessment have already been completed. An RFP will be made for detailed construction plans in 2019. The restoration work will be contracted out ($245,000) under supervision of TNC staff ($15,000).

ENRTF BUDGET: $ 260,000

Outcome	Completion Date
1. Develop RFP for stream restoration work to contract our construction	August 2019
1.Installation of two engineered wood jams on two meander bends; increasing depth variety, cover for stream fish and invertebrate structure	August 2020
2. 200 to 400 feet of toe-wood installed and floodplain bench re-established, fish & invertebrate habitat increased	August 2020

Activity 2: *Assess benefits with post-project monitoring and dissemination of results*
Description: Post-project establishment and success will be measured by a University of Minnesota graduate student working with TNC staff to compare the relative benefits of the stream restoration techniques and their per-foot cost of implementation. Geomorphic response to the wood structures including changes to stream

dimensions, pool habitat and sediment deposition will be assessed. Fish community surveys will be done via fish shocking along with invertebrate surveys at the project areas. Two workshops and/or field days will be done for stream restoration professionals and interested landowners in 2021-2022.

ENTRF BUDGET: Budget: $40,000

Outcome	Completion Date
1. Successful establishment of wood structures and quantification of cost-effectiveness	May 2021
2. Stream response (geomorphic, fish and invertebrates) to wood structure installation	June 2022
3. Two workshops or field days with stream restoration professionals and local citizens	June 2022

Activity 3: *Develop guidance for sustainable stream and floodplain restoration practices in the Driftless Area using GIS analysis, field assessment and monitoring*
Description: Using GIS analysis, LIDAR, field survey of in-stream wood and riparian vegetation and analysis using predictive equations for large wood retention (developed in past University of Minnesota research), suitable locations for large wood placement will be identified in the Root River Watershed. We will also develop guidelines based on stream and watershed traits, riparian forest properties and large wood supply to determine where large wood placement makes the most sense. The guidelines developed through the GIS analysis and restoration research onsite will provide insight into the cost-effectiveness and sustainability of stream restoration techniques that provide an array of ecosystem services through floodplain connectivity and in-stream wood than typically provided by structural habitat projects for trout.

ENTRF Budget: $17,300

Outcome	Completion Date
1. Wood traits identified needed to maintain habitat function in streams	June 2022
2. Suitable locations identified in the Root River basin for placement of large wood	June 2022
3. Guidelines developed for siting in-stream wood placement projects in the region to maximize sustainability and cost-effectiveness	June 2022

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

We will be working with the University of Minnesota, graduate research assistant, 25% for two years; $45,000 .

B. Partners not receiving ENTRF funding:

Minnesota DNR

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

Restoration at this site will test several common restoration practices using large woody material, helping to inform the relative cost-effectiveness of each. Understanding the most efficient restoration methods for both habitat and ecosystem services benefits will help increase the scale and pace of ongoing region-wide stream restoration efforts. The results of the study will be written up in science journal articles and shared on TNC and partner websites. The Minnesota DNR will be the long-term manager of the WMA.

V. TIME LINE REQUIREMENTS:

With ENTRF funding in July 2019, project planning and development of an RFP for restoration would occur in late 2019 with construction in winter 2019-2020. Pre-project assessment would be in done in fall 2019. The three year period would allow for construction to continue into 2021 in case all tasks could not be accomplished in the first winter. Post-project monitoring and the GIS analysis of more sustainable wood jam locations would continue and be completed by 2022.

2019 Proposal Budget Spreadsheet

Project Title:Innovative strategies to re-introduce wood into Driftless Area streams

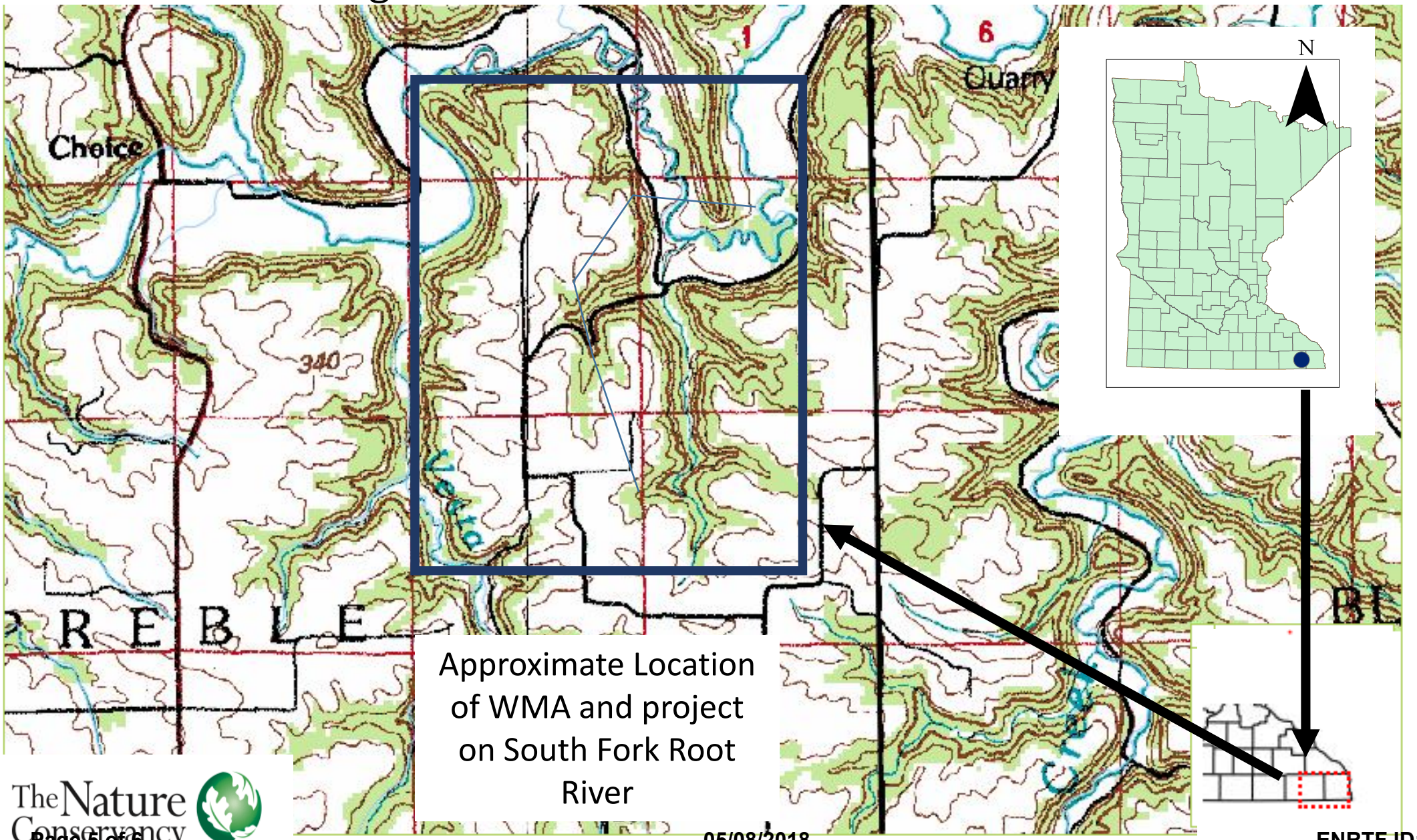
IV. TOTAL ENRTF REQUEST BUDGET *3* **years**

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel: David Schmidt, project management, 13% FTE Chris Lenhart, project design, monitoring and research, 10% FTE Benefits budgeted at 28.6% of personnel costs, will be charged at rate subject to change annually.	$ 58,300
Professional/Technical/Service Contracts: installation of toe wood and engineered log jams, development of site-specific implementation and grading plan, grading, material acquisition, contractor services as needed. Graduate student, person to be determined, for monitoring and GIS analysis, 25% time at University of Minnesota, 2 years.	$ 245,000
Equipment/Tools/Supplies: monitoring supplies for post-project monitoring evaulation; stream survey equipment; monitoring wells for riparian area near wood structures, fish eloctroshocking rental; invertebrate sampling equipment	$ 10,000
Acquisition (Fee Title or Permanent Easements): The project area is in public ownership so no funds are needed	$ -
Travel: travel from Winona to Choice, Mn site by David Schmidt; from St. Paul to Choice site 10 x $200, and other travel as needed.	$ 4,000
Additional Budget Items:	
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 317,300

V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period: Private funds secured to support restoration, and associated indirect. Unrecovered indirect as leverage budgeted conservatively and reported at our NICRA rate. TNC staff time not charged to project, such as for example Rich Biske, Freshwater Program Director and others as needed.	$120,000	*secured*
Other State $ To Be Applied To Project During Project Period: (DNR staff may contribute time that is complementary to the project, for management of the WMA that is not included in the budget)	$ -	
In-kind Services To Be Applied To Project During Project Period:	$ -	
Other Funding History: approximately $6120 was spent by TNC on site assessment in 2016-17	$ 6,120	*secured*

Innovative strategies to reintroduce wood to Driftless Area streams



Project Manager Qualifications:

Project Manager: Chris Lenhart, Applied Scientist with The Nature Conservancy and Research Assistant Professor in the University of MN Department of Bioproducts and Biosystems Engineering

Responsibilities Pertaining to the Proposal:

1) Coordinate the design and installation of wood jam and toewood structures on South Fork Root River.

2) Administer contracts associated with the project.

3) Supervise restoration monitoring and research relating to the project

4) Organize and lead workshops and field days to share results with stream restoration partners and scientists,

5) Conduct or supervise GIS analysis to develop guidance for future practices in the Driftless Area.

Chris has Ph.D. in Water Resource Science from the University of Minnesota, and been a Research Assistant Professor there since 2010. His list of publications includes the journals *Ecological Restoration*, *River Research and Applications, Journal of Water Resource Planning & Management,* and *Water.* He currently also serves as a restoration scientist with the Minnesota chapter of The Nature Conservancy, helping to plan, prioritize, and design ecological restorations of freshwater systems and habitats.

The Nature Conservancy

The mission of The Nature Conservancy is to conserve the lands and waters on which all life depends. Since 1958, The Nature Conservancy has helped protect more than 650,000 acres of forests, prairies, rivers, lakes and wetlands in Minnesota. In Southeast Minnesota, The Nature Conservancy has been a leader in protecting and restoring habitat, as well as planning and coordination with diverse stakeholder groups to maximize effectiveness of conservation in Minnesota's Blufflands region.