Environment and Natural Resources Trust Fund

2027 Request for Proposal

General Information

Proposal ID: 2027-064

Proposal Title: Informing Habitat Restoration Design to Benefit Brook Trout

Project Manager Information

Name: Daniel Dauwalter

Organization: Trout Unlimited, Inc.

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Project Basic Information

Project Summary: This project will elicit what practitioners need to improve habitat restoration designs for Brook Trout, and study seasonal habitat use of Brook Trout at multiple scales, in southeast Minnesota.

ENRTF Funds Requested: $298,000

Proposed Project Completion: December 31, 2030

LCCMR Funding Category: Small Projects (G)

Secondary Category: Fish and Wildlife (D)

Project Location

What is the best scale for describing where your work will take place?

Region(s): SE

What is the best scale to describe the area impacted by your work?

Region(s): SE

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Trout fishing is an economic driver of rural communities in Minnesota. Southeastern Minnesota's Driftless Area accounts for 33% of coldwater fishing trips and 75% of stream fishing trips in the state. With this economic driver in mind, coupled with degraded stream conditions from poor historical land use, stream habitat restoration projects are a key conservation action to improve both ecological condition and trout fishing. In Minnesota's Driftless Area alone, restoration expenditures were recently estimated at $1.5 million.

The Brook Trout is native to Minnesota and is a Species of Greatest Conservation Need. A recent angler survey noted an interest in Brook Trout and the desire for more trout stamp proceeds to be spent on Brook Trout management. Although stream habitat improvement and restoration techniques have changed over time, the understanding of the Brook Trout habitat needs in southeastern Minnesota remains incomplete. As a result, restoration designs cannot fully account for these species-specific habitat needs, and some habitat projects have led to counterintuitive responses by Brook Trout populations. For example, recent habitat improvement projects using standard designs for the Driftless region intended to benefit Brook Trout created beneficial outcomes for non-native Brown Trout to the detriment of Brook Trout.

What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.

Trout Unlimited, Inc. proposes to synergize Brook Trout habitat restoration in Minnesota with two linked activities. First, we will characterize how stream restoration goals, and thus, restoration projects are designed, to benefit native Brook Trout and identify barriers to doing so. This will help practitioners adjust decision-making to better ensure restoration outcomes are favorable for native Brook Trout. Second, there is a lack of understanding of Brook Trout habitat needs to inform stream restoration design to benefit the species. We will fill this knowledge gap by synthesizing the scientific literature on Brook Trout habitat needs and conduct a field study on Brook Trout habitat use when they occur alone and together with non-native Brown Trout so that restoration can be designed to favor Brook Trout when faced with non-native competitors.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

Our project will advance habitat restoration for Minnesota's Brook Trout with these 2 outcomes:

1: Characterization of how stream restoration practitioners identify projects, define project goals, and design projects, for native Brook Trout, and identification of barriers to doing so, to improve certainty around habitat restoration outcomes for the species in Minnesota's Driftless Area.

2: Identification of key habitat needs for Brook Trout through a science synthesis and a field study of habitat use by Brook Trout, with and without Brown Trout present, to inform habitat restoration designs in southeast Minnesota.

Activities and Milestones

Activity 1: Understanding Stream Restoration Goals and Project Design to improve Brook Trout Outcomes from Habitat Restoration in Minnesota

Activity Budget: $73,000

Activity Description:
Stream habitat restoration projects often lack clear goals, rely heavily on the same techniques project-by-project regardless of context, and lack clear connections between project design and habitat needs of target species. Additionally, practitioners are a diverse group of individuals trained across disciplines. This has fueled a wide range of approaches to habitat restoration projects, including when benefiting Minnesota's native Brook Trout is a goal. Further, the information project managers and engineers need to meaningfully incorporate Brook Trout habitat needs in restoration design remains unclear.

We propose to work with stream restoration practitioners to better understand the information they need to directly incorporate Brook Trout habitat needs into restoration designs. While previous research has detailed habitat needs of Brook Trout, these studies are based largely on adult trout during summer in regions other than the Driftless Area. We will use structured interviews and surveys to elicit how practitioners incorporate fish species habitat needs into stream restoration design, and we will elicit what information practitioners need so that restoration project design elements can be clearly connected to Brook Trout habitat needs. This will ensure restoration designs are favorable to Brook Trout when benefiting Brook Trout is the goal of habitat restoration.

Activity Milestones:

Description	Approximate Completion Date
Confirm participants for study inclusion	October 31, 2027
Complete semi-structured interviews	October 31, 2028
Complete report and share with participants for feedback	June 30, 2029
Complete activity manuscript with contributed feedback from participants	June 30, 2030

Activity 2: Brook Trout Habitat Needs Science Synthesis and Field Study to Inform Stream Restoration Design

Activity Budget: $225,000

Activity Description:
Restoration designed to benefit native Brook Trout requires better information on Brook Trout habitat needs when they occur both alone and together with non-native Brown Trout. Minnesota stream restoration projects are designed and implemented using techniques known to benefit non-native Brown Trout but, in some cases, have been injurious to Brook Trout. This leads to the question: are commonly used stream restoration techniques improving stream habitat for both Brown and Brook Trout, or are habitat projects improving habitat for non-native Brown Trout at the expense of Brook Trout, and why?

Working in collaboration with Minnesota DNR, we propose to: 1) synthesize the scientific literature on Brook Trout habitat use in the Driftless Area and other regions, and 2) conduct a field study to document seasonal habitat use by Brook Trout life stage, season, and spatial scale in a Driftless Area stream where Brown Trout are absent, and in a second stream where Brown Trout co-inhabit with Brook Trout. This dual study design will elucidate how Brook Trout use habitat in the absence of Brown Trout and when they occur together with Brown Trout, so that habitat restoration can be designed to enhance competitive advantage for native Brook Trout.

Activity Milestones:

Description	Approximate Completion Date
Initial project setup, including tagging of Brook Trout (100 radio telemetry tags), for seasonal tracking	September 30, 2027
Complete year 1 fieldwork (seasonal tracking, habitat assessments, etc.)	June 30, 2028
Completes Brook Trout habitat needs literature synthesis	June 30, 2028
Complete year 2 fieldwork (additional tags, seasonal tracking, habitat assessments, etc.)	June 30, 2029
Complete year 3 summer fieldwork (microhabitat use evaluation, and habitat assessments	August 31, 2029
Complete data analysis, report, and activity manuscript	June 30, 2030

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Doug Dieterman, Ph.D.	Minnesota DNR - Fisheries Research	Collaborator	No
Neal Mundahl, Ph.D.	Winona State University	Collaborator	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.
Project results will be disseminated in three ways. First, presentations will be given at scientific conferences, such as the American Fisheries Society (MN Chapter or similar). Second, a report demonstrating how restoration practitioners set goals and design projects to benefit Brook Trout or barriers to doing so, a synthesis of the peer-reviewed literature on Brook Trout habitat needs in the Driftless Area and other regions, and results of the field study on Brook Trout habitat use in the presence, or not, of non-native Brown Trout in the Minnesota Driftless Area. Third, each element will be published in the peer-reviewed scientific literature to disseminate it to the scientific community and public and demonstrate the robustness of results and conclusions drawn.

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this work be funded?
Characterization of restoration goals and designs to benefit brook trout, synthesis of the scientific literature on Brook Trout habitat needs, and Brook Trout habitat use when alone or when co-occurring with non-native Brown Trout in Minnesota's Driftless Area will be presented at scientific conferences and published in the peer-reviewed scientific literature.

Project Manager and Organization Qualifications

Project Manager Name: Daniel Dauwalter

Job Title: Fisheries Science Director

Provide description of the project manager's qualifications to manage the proposed project.
Dan is Fisheries Science Director in Trout Unlimited's national Science Program, a position he's held since 2016 (employed by Trout Unlimited since 2008). A graduate of Chaska High School (Chaska, MN), Dan received a B.A. in Biology / Environmental Studies in 1999 from Gustavus Adolphus College (St. Peter, MN), a M.S. in Aquaculture/Fisheries in 2002 from the University of Arkansas at Pine Bluff (Pine Bluff, AR), and he received his Ph.D. in Wildlife and Fisheries Ecology from Oklahoma State University in 2006 (Stillwater, OK). As a scientist in TU's national science program, Dan has experience and training in fisheries ecology, remote sensing, and GIS. He oversees projects ranging from geospatial conservation assessment and planning, including the application of TU's Conservation Success Index to Brook Trout in the Driftless Area as decision support tools for TU's restoration programs. Dan also has experience developing species status assessments for native trout and salmon that have led to the removal of a native trout from the federal list of threatened and endangered species. He also has experience synthesizing the peer-reviewed literature on topics ranging from fish stocking, remote sensing, and water balance outcomes from stream restoration. Dan has direct experience

evaluating native fish species' habitat needs at various spatial scales and life stages. Dan has also developed angler science programs to leverage TU's grassroots volunteers to crowdsource water quality information in the Driftless Area of southeast Minnesota and neighboring states. Dan has 60 peer-reviewed publications on these topics.

Organization: Trout Unlimited, Inc.

Organization Description:
Trout Unlimited, inc. is a national non-governmental organization with a mission to bring together diverse interests to care for and recover rivers and streams so children can experience the joy of wild and native trout and salmon. Founded in 1959, TU is now comprised of 300,000 members and supporters, 400 chapters, and over 350 full-time staff nationwide. Since its founding, TU has worked to protect and restore streams and rivers across the county, and stream and river restoration remains TU's bread and butter conservation action. TU's science program is comprised of scientists with expertise in conservation genetics, fluvial geomorphology, fisheries science and ecology, human dimensions, and geographic information systems. The science program is a national leader in conservation and salmonid science that generally works in four main areas: conservation planning, conservation research, monitoring and evaluation, and science engagement. View Trout Unlimited's 2021 Strategic Plan here: https://www.tu.org/conservation/our-approach/strategic-plan-2021/

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Dr. Daniel Dauwalter (Principal Investigator)		Overall project management and coordination. Assist Co-I Lundberg with coordination and implementation of Activity #1. Coordinate with MN DNR on design, setup, and implementation of field study Activity #2.			58.8%	0.39		$61,500
Dr. Emma Lundberg (Co-Investigator)		Lead Activity #1: Synthesis of restoration goals and designs for Brook Trout. Interviews with restoration practitioners, develop surveys, lead data analysis and reporting. Activity #2: Lead literature synthesis and design and implementation of field study Activity #2.			58.5%	0.75		$99,600
Field Technician		Assist Field Lead, PI, and Co-I on execution of field study; 2 summers of seasonal, 40hr / week x 12 weeks x 2 = 24 weeks			9.2%	0.46		$20,900
Field Lead (Seasonal)		Setup project with PI and Co-I, and lead field work. 2 summers full time 40hr/wk x 12 weeks, 1 week each in fall, winter, spring x 2 years = 30 weeks			9.2%	0.58		$33,000
Administrative Staff		Administrative staff time for grant management, purchasing, accounting, and payroll			58.5%	0.18		$29,500
							Sub Total	**$244,500**
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
	Tools and Supplies	Radiotags (200 tags total, 100/year, $185/tag)	Radiotags to track Brook Trout habitat use					$37,000
	Tools and Supplies	Field supplies: Waders, blaze orange, snorkel and mask, electrofishing supplies, telemetry equipment maintenance.	Supplies for field study, including maintenance of existing equipment					$1,500
							Sub Total	**$38,500**

Capital Equipment								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	Winona, MN to study streams for field work (Activity #2): 100 miles/trip x $0.725/mi x 30 trips/yr x 2 years = $4350	Travel by seasonal personnel from Winona to field study sites weekly in summer, and track movement and habitat use of Brook Trout multiple times a year (seasonally)					$4,350
	Miles/ Meals/ Lodging	5 trips from Minneapolis to field sites in SE, MN; 300 mi (round trip) x $0.725 /mi (GSA rate) x 5 trips = $1088; 4 nights lodging / trip x $110 / night (GSA) x 5 trips = $2200; $68 / day (GSA M&IE) x 5 days x 5 trips = $1700; $1088+2200+1700 = $4988 (Activity #2)	Travel of PI and Co-I from Minneapolis to SE Minnesota to study streams to organize field study and field work with MN DNR					$4,988
	Conference Registration Miles/ Meals/ Lodging	Upper Midwest Stream Restoration Symposium. Registration $450, 4 days (4 nights lodging $110/night + M&IE 68 / day x 4 days = $1162)	Interview stream restoration practitioners for human dimensions study (Activity #2) and disseminate study results					$1,162
							Sub Total	**$10,500**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Publication	Page charges for 2 peer-reviewed publications ($2000 / publication x 2)	Journal page charges for peer-reviewed publication of practitioner restoration goals and design, brook trout habitat use science synthesis and field study results.					$4,000
							Sub Total	**$4,000**

Other Expenses								
		ATS radio telemetry receiver maintenance	Refurbish radio telemetry receiver loaned from MN DNR by Advanced Telemetry Systems					$500
							Sub Total	**$500**
							Grand Total	**$298,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
Cash	Trout Unlimited Coldwater Conservation Fund	Cover ineligible indirect expenses: General operations, overhead, and other indirect expenses, including office maintenance, office utility expenses, and office materials and supplies; office rent.	Potential	$50,000
Cash	Lyda Hill Philanthropies	Develop and refine semi-structured interview processes and survey methods for restoration practitioners for use in understanding restoration project design and goals for Brook Trout.	Secured	$35,000
			Non State Sub Total	**$85,000**
			Funds Total	**$85,000**

Total Project Cost: $383,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: aaca8639-573.pdf

Alternate Text for Visual Component

Photos of habitat restoration and an angler fishing a restored stream in the Driftless Area...

Financial Capacity

Title	File
Trout Unlimited 990	8c32a6a1-65c.pdf

Board Resolution or Letter

Title	File
Trout Unlimited Letter	afaf9450-b35.pdf

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
A Driftless Area stream with an eroding streambank that requires habitat restoration.	b7fbfac8-144.jpe
Co-Investigator Dr. Emma Lundberg demonstrates surgery for implanting Brook Trout with a temperature tag.	c293f39f-e47.jpe
Principal Investigator Dan Dauwalter fishing a restored Brook Trout stream in the Driftless Area	63a03c3c-7ca.jpe
Co-Investigator Dr. Emma Lundberg's study on Q study on restoration practitioners in the Driftless Area.	41d0dc60-22a.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the Commissioner's Plan applies.

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing $10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this proposal:

Dr. Emma Lundberg, Trout Unlimited

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

N/A