



Environment and Natural Resources Trust Fund

2025 Request for Proposal

General Information

Proposal ID: 2025-273

Proposal Title: Riparian Zones: Managing the Landscape to Protect Streams

Project Manager Information

Name: Andrew Robertson

Organization: Saint Mary's University

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Project Basic Information

Project Summary: Assessing riparian zone buffering efficiency for preserving or improving physical stream health across different riparian zone types.

ENRTF Funds Requested: \$250,000

Proposed Project Completion: June 30, 2027

LCCMR Funding Category: Small Projects (H)

Secondary Category: Water Resources (B)

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 streams in the Driftless Area (DA) are negatively impacted; > 80% of streams in SE MN have been classified as impaired for nutrients, sediments, and macroinvertebrates. Human factors negatively impact stream health such as landscape alterations (i.e., agriculture and roadways) of the floodplain and storm events. Stream restoration activities seek to improve habitat for sensitive biota (e.g., trout, macroinvertebrates) which are regularly implemented with goals of “restoring” habitat for aquatic life. Why are trout streams of southeastern Minnesota still listed impaired? Managing and understanding streams from the proper scale (i.e., catchment > riparian zone) can better aid with increasing stream health by understanding relationships of certain characteristics (i.e., slope, floodplain dynamics, land use, grass buffers, tree buffers etc.). Identifying correlations within the catchment scale and riparian zone type (i.e., forested, grassy) to instream habitat can yield valuable information on how to improve stream health in the DA through catchment and riparian zone development and or protection using naturally occurring landscape features. Using existing catchment (e.g., grass waterways) and riparian zone features (e.g., wide buffers or fencing for protection) has been shown to improve stream health and can be applied to streams in SE MN.

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.

To enhance stream health in the DA, this project proposes the following:

1. Identify reference streams that are minimally impacted that best represent ideal condition and function for streams in SE MN.
2. Identify catchment and riparian zone physical features that are most efficient at buffering and protecting streams from eroding soils and nutrient inputs.
3. Identify streams that could potentially benefit from catchment scale enhancements while facilitating a focus on riparian zone management and community practice.

As a result, this project will implement a more viable approach to stream ecosystem protection, enhancement, and management for future generations. There are three aspects to this project. First, to better manage streams, this project will investigate catchment features important for reducing nutrients and erosion (i.e., valley slope and width, land use %, proximity, edge of field practices to name a few). Second, we will investigate riparian zone type (i.e., grass and forest) and its effectiveness in buffering and protecting and enhancing stream health. Third, improve a community of practice on stream health improvements by collaborating with multiple, private and public entities. Collaborations will aim to improve stream health, community outreach (awareness), education for the public (understanding science), and site prioritization.

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?

1. Identify catchment and riparian attributes required for stream health improvements.
2. Improve stream health throughout the DA by addressing and or bringing together most efficient catchment and riparian zone management strategies for future generations.
3. Build and continue collaborative partnerships focused on improving stream health through simple cost-effective measures enhancing catchment and riparian zone features.
4. Increase awareness of issues revolving around sensitive stream ecosystems and their value in the DA through education, partner collaborations, and dissemination.

Activities and Milestones

Activity 1: Identify, assess, and establish reference sites for riparian zone efficiency comparisons.

Activity Budget: \$166,667

Activity Description:

The Driftless Area is a unique bio-ecoregion affected by human activities such as landscape alterations for agriculture. Catchment and Riparian zone management protocols will be developed in this project to improve stream health. Step 1 – identifying quality, minimally impacted streams, with minimally impacted catchments and riparian zones, will be instrumental in determining attributes conducive to good stream health. Data will include catchment and riparian zone features (e.g., valley slope, valley width, land use %, grass and forest buffers (width), physical instream habitat measurements, nutrient data (nitrogen and phosphorus as examples), and biological data (fish and macroinvertebrate)). We will compare other catchment and riparian zone types to our reference site. Step 2 – we will develop an applied approach to assessing and managing streams at the catchment scale. Step 3 – train and develop one graduate student for all field work and analysis, collaborate with partners for nutrient and other chemical analysis. To develop and execute an effective project design, we will need to gather essential materials for stream sampling and data analysis for the duration of the project.

Activity Milestones:

Description	Approximate Completion Date
Identify stream habitat project sites and compile existing data	July 31, 2025
Equipment acquisition	September 30, 2025
Graduate student development and training	September 30, 2025

Activity 2: Learning opportunities and outcomes.

Activity Budget: \$83,333

Activity Description:

To increase stream health, we will promote collaborative efforts that enhance learning opportunities for better managing stream ecosystems at broad scales. Coldwater streams of SE MN are valuable to local economies generating an estimated US\$1.6 billion from tourism for trout angling. There are over 17,000 miles of trout streams in DA with a high demand for improving stream health. In SE MN, > 60 miles of streams have received habitat improvements by Minnesota Trout Unlimited with an investment of > US\$18 million. By changing our approach to stream health improvements, building collaborative efforts, and maintaining strong relationships with multiple organizations (MNDNR, MPCA, WSU, MN TU, TUDARE) along with good landowner stewardship, will increase and enhance our understanding of stream ecosystems dynamics and health. Analysis of catchment features and riparian zone type and their relationship to improving stream health will aid in defining and describing what a typical “healthy stream” should exhibit. Results of this project will be presented and disseminated at local and or regional conferences, public talks, and publications of findings.

Activity Milestones:

Description	Approximate Completion Date
Analyze and report findings	June 30, 2027
Disseminate findings and publications	June 30, 2027

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Justin Watkins	MN Pollution Control Agency	Advisor - Watkins is a Watershed Unit Supervisor with the Minnesota Pollution Control Agency in southeast Minnesota. Justin brings a wealth of knowledge on the effects of pollution on coldwater streams along with a background in stream and river ecosystem ecology with over 20 years of experience managing watersheds	No
Martin Thoms	University of New England, Australia	Advisor - Dr. Martin Thoms at the University of New England, Australia) has a background in freshwater ecology, population dynamics of aquatic organisms, ecosystem function, fluvial geomorphology and river restoration science.	No
William Varela	Saint Mary's University of Minnesota	Varela is a PhD candidate and has researched and published peer-reviewed articles on coldwater streams of southeast Minnesota affected by changes in the landscape and currently is working on assessing river habitat improvement projects across SE MN.	Yes

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?

Long-term implementation will be in the form of publications and community outreach. Both will facilitate the sharing of data, information, and learnings of catchment and riparian zone management among a community focused on improving stream health in the DA. Awareness of sensitive ecosystems will promote monitoring on landscapes and streams. Our community of collaborators can work together to build an online platform to share data. Future projects can be identified and improved with funding strings from outside sources. This will be an ongoing effort to show results of this scientific approach into stream health improvements.

Project Manager and Organization Qualifications

Project Manager Name: Andrew Robertson

Job Title: Executive Director

Provide description of the project manager's qualifications to manage the proposed project.

Andrew Robertson is Executive Director of GeoSpatial Services at Saint Mary's University of Minnesota where he leads an experiential learning project center that focuses on providing students with work experience in natural resource management through targeted internships. He is a Registered Professional Forester with expertise in industrial forest management, wetland ecology, wetland restoration, riparian biodiversity, watershed planning and geospatial technologies and modelling. Andrew also has over 20 years of applied science experience across the Driftless Area of Minnesota assessing agricultural best management practices for managing water quality improvements. Assisting with this project are Justin Watkins and William Varela. Watkins is a Watershed Unit Supervisor with the Minnesota Pollution Control Agency in southeast Minnesota. Justin brings a wealth of knowledge on the effects of pollution on coldwater streams along with a background in stream and river ecosystem ecology with over 20 years of experience managing watersheds and landscape changes. Varela is PhD student (under the guidance of Dr. Martin Thoms at the University of New England, Australia) with a background in freshwater ecology, population dynamics of aquatic organisms, ecosystem function, fluvial geomorphology and river restoration science. Varela has researched coldwater streams of southeast Minnesota affected by changes in the landscape and currently is working on assessing river habitat improvement projects across SE MN. The project team has considerable experience contributing to previous LCCMR projects with such partners as the MN DNR, MPCA, TNC and the University of Minnesota.

Organization: Saint Mary's University

Organization Description:

Saint Mary's University of Minnesota is a private, Lasallian Catholic university located in Winona, Minnesota, United States. It was founded in 1912 by the Brothers of the Christian Schools, a Catholic religious order that was founded by Saint John Baptist de La Salle.

Saint Mary's University of Minnesota offers undergraduate and graduate degree programs in a wide range of academic fields, including business, education, healthcare, social work, and the liberal arts. The university is known for its strong commitment to social justice and service, as well as its emphasis on experiential learning and student leadership development.

The university's main campus is located on a scenic bluff overlooking the Mississippi River in Winona, and it also has satellite locations in the Twin Cities and Rochester areas of Minnesota. The university has a diverse student body, with students from over 30 states and 20 countries, and it offers a variety of extracurricular activities, including athletics, student clubs, and community service opportunities.

Saint Mary's University of Minnesota is accredited by the Higher Learning Commission and is a member of the Council of Independent Colleges and the National Association of Independent Colleges and Universities.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Principal Investigator		Supervise and oversee project milestones, 2 years. Project design.			32%	1.2		\$50,490
Secondary PI		Project design, project oversight.			8%	0.8		\$34,425
Environment Technician		Project design, field and lab support			8%	2		\$99,829
Graduate Student		Field and lab support			8%	0.4		\$24,280
							Sub Total	\$209,024
Contracts and Services								
Winona State University Chemistry	Professional or Technical Service Contract	Nutrient processing and analysis				-		\$7,000
University of California Davis	Professional or Technical Service Contract	Stable Isotope Analysis				-		\$5,000
							Sub Total	\$12,000
Equipment, Tools, and Supplies								
	Equipment	Soil sampler, sample jars, waders, gloves, computer	sample collection					\$3,000
	Equipment	YSI pro multiparameter water quality meter	water quality sampling					\$2,500
	Equipment	SonTek flow tracker 2 – flow meter	flow measurement					\$4,000
	Equipment	Surveying equipment	site surveys					\$3,500
							Sub Total	\$13,000
Capital Expenditures								
							Sub Total	-

Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Mileage, car rental fees to travel to 15-20 sites across two field seasons in SE MN. 1 Graduate student, 1 student technician.	Travel to stream sites approx. 120 mil/site x 30 sites = 3,600 mi x 0.58/mi = \$2,088 x 2 = \$4,176 lodging ~ 20 overnights = \$2,000 x 2 = \$4,000					\$8,176
							Sub Total	\$8,176
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Publication	Dissemination of findings	US and International Publications					\$7,800
							Sub Total	\$7,800
Other Expenses								
							Sub Total	-
							Grand Total	\$250,000

Classified Staff or Generally Ineligible Expenses

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

Category	Specific Source	Use	Status	Amount
State				
In-Kind	Justin Watkins – Minnesota Pollution Control Agency	Project oversight, guidance, resource acquisition and allocation, field assistance.	Secured	\$44,000
			State Sub Total	\$44,000
Non-State				
In-Kind	William Varela University of New England Australia	Project oversight, guidance, field assistance, data analysis	Secured	\$40,000
			Non State Sub Total	\$40,000
			Funds Total	\$84,000

Total Project Cost: \$334,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [08ea5571-b23.pdf](#)

Alternate Text for Visual Component

Map of the Driftless Area across four states. Minnesota Driftless area in the upper left quadrant, southeastern MN, is where this project will be executed. Map courtesy of Minneapolis/St. Paul travel and visitor guide....

Financial Capacity

Title	File
Capacity Letter	9182d7d6-8ab.pdf

Supplemental Attachments

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

Title	File
Support Publication	57aafa3c-8e5.docx

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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:

