Environment and Natural Resources Trust Fund

M.L. 2025 Approved Work Plan

General Information

ID Number: 2025-270

Staff Lead: Michael Varien

Date this document submitted to LCCMR: June 11, 2025

Project Title: A Riparian Area Adaptation Strategy for Southeast Minnesota

Project Budget: $243,000

Project Manager Information

Name: Christian Lenhart

Organization: The Nature Conservancy

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Email: christian.lenhart@tnc.org

Web Address: https://www.nature.org/en-us/

Project Reporting

Date Work Plan Approved by LCCMR: June 24, 2025

Reporting Schedule: March 1 / September 1 of each year.

Project Completion: June 30, 2028

Final Report Due Date: August 14, 2028

Legal Information

Legal Citation: M.L. 2025, First Special Session, Chp. 1, Art. 2, Sec. 2, Subd. 08o

Appropriation Language: $243,000 the first year is from the trust fund to the commissioner of natural resources for an agreement with The Nature Conservancy, in partnership with the University of Minnesota, to assess an alternative adaptation strategy to restore riparian areas by excavating and planting riparian shrubs to reconnect the floodplains. This appropriation may also be used for outreach materials and educational activities.

Appropriation End Date: June 30, 2028

Narrative

Project Summary: We will conduct research on a riparian climate change adaptation strategy involving floodplain reconnection and shrub planting in Southeast Minnesota in partnership between TNC and the University of Minnesota

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

The Driftless Area of Minnesota is particularly prone to rapid runoff and erosion issues. Many of the valleys have been filled with legacy sediment from past erosion. As the streams cut back down through the deep sediment deposits, many streams had reduced floodplain connectivity and functionality. This created further environmental problems by increasing channel erosion and worsening flooding issues downstream. At the same time, we are experiencing increased rainfall and runoff, particularly in Southeast Minnesota. The Driftless Area has experienced the greatest increases in rainfall of any area in the state. Higher temperatures in streams are problematic for aquatic life as well. These combined stressors create a pressing need to develop a viable adaptation strategy in riparian areas of the Driftless Area that increase floodplain connectivity and make our streams more resilient to climate change. We have the opportunity to research a unique riparian adaptation restoration project being implemented at Vesta Creek in 2024-25. The project introduces a unique adaptation strategy involving low-tech stream restoration and climate-adapted shrub plantings. By comparing to traditional restoration approaches and a control site with no management done, the project will help inform badly needed stream adaptation strategies for the Driftless Area.

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.

We will investigate riparian area adaption strategies that makes streams more adaptable to increased flows by increasing floodplain connectivity in a cost-effective manner, while promoting climate-adapted shrubs and trees in the riparian zone. Floodplain connectivity is increased by excavating out excess floodplain sediment and depositing it outside of the active floodplain. Costs are kept down by minimizing in-stream structures and use of large rock. Reducing installation and maintenance costs make the projects more sustainable and resilient to future flow changes. We will plant more southern sources of shrubs and species near the northern end of their ranges to increase the resilience of the experimental restoration site being constructed in 2024 along Vesta Creek in Fillmore County. We will assess the benefits of the adaptation approach compared to a more traditional stream restoration project around the Choice Wildlife Management Area (WMA) and nearby streams. We will also research a control site, where no restoration or management has been done. The results of the study will inform an alternative approach to riparian corridor restoration and management that is complementary to existing restoration efforts. The new approach will increase resilience by increasing floodplain connectivity of streams that were contained within steep stream boundaries.

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?

The project will inform policy on floodplain function enhancement and climate change adaptation strategies, particularly in steep terrain and areas with entrenched streams. The approach is expected to enhance the ecological value of riparian corridors and floodplains. By grading back steep banks and connecting the floodplain it will reduce channel loading of sediment helping to improve water quality downstream. It will also promote more long-lived restoration projects that require less maintenance and are more resilient to climate change. Lastly, the approach is more cost-effective, helping to make stream restoration projects more economically feasible.

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?

Statewide

When will the work impact occur?

During the Project and In the Future

Activities and Milestones

Activity 1: stream geomorphic assessment

Activity Budget: $170,000

Activity Description:
We will assess hydrologic conditions, sediment removal and other water quality benefits including nitrogen and phosphorus removal potential at the study sites. The research questions we will address include: How has hydrologic connectivity, sediment and nutrient removal been changed by restoration? We'll setup three study sites in the area: a control (no restoration), adaptation approach (Vesta Creek), and traditional restoration approach (Maple Creek or similar recently restored site). The control site will not have restoration actions done. The traditional approach will involve placement of in-stream and bank practices but not climate adaptation plantings nor floodplain excavation. The adaptation approach will include both excavation and planting of riparian shrub. At the research sites we will collect hydrologic data on water level and sediment accumulation in the floodplain. We will install monitoring wells in the floodplain and a velocity probe in-stream at each study site. We will measure sediment aggradation using topographic surveys and measurement of aggradation on mats. We'll also measure nutrient concentration in the floodplain using soil samples and empirical tools such as the WRET or others. Finally, we'll estimate bank erosion rates and net sediment gain or loss from the gully control project and stream restoration work.

Activity Milestones:

Description	Approximate Completion Date
Survey of potential "control" sites for the study	October 31, 2025
Installation of hydrologic monitoring equipment at study sites	October 31, 2025
Complete monitoring and data collection on hydrology and sediment at study sites	October 31, 2027
Report on findings	June 30, 2028

Activity 2: riparian planting assessment

Activity Budget: $50,000

Activity Description:
We will assess the survival and compositional changes of riparian shrub plantings at the experimental site in Vesta Creek, comparing them with a traditional stream restoration project at the traditional restoration site. Shrub species selection will prioritize native species based on considerations of ecological suitability and resilience to climate change. Our approach will be conservative, allowing for species movement within their current or historic range and slightly into projected future hardiness zones ('facilitated adaptation'). At Maple Creek, a standard seed mix typical for southeastern floodplain habitat will be planted in the traditional restoration. Biannual plant surveys will be conducted to track changes over the study duration. Additionally, vegetation composition and natural regeneration will be surveyed at control sites where no active management occurred. All sites will be in the Root River watershed, allowing for comparative analysis of treatments. Furthermore, we will conduct a site inventory to assess current conditions across the study area. The data collected will serve as the basis for future long-term monitoring of trends in population dynamics, phenological shifts, and habitat changes if additional funding is obtained. The outcomes of our study will inform approaches to enhance ecosystem resilience and biodiversity in riparian habitats of the Driftless.

Activity Milestones:

Description	Approximate Completion Date
Reconnaissance-level surveys to identity control site (no-restoration)	October 31, 2025
Year 1 plant surveys at study sites	October 31, 2025

Measure other vegetative conditions in floodplain and complete plant surveys	December 31, 2027
Project report	June 30, 2028

Activity 3: Outreach and education activities

Activity Budget: $23,000

Activity Description:

We will organize a public workshop, conduct field trips, and produce 1-2 publications. The workshop will focus on sharing project goals, methodologies, and proposed outcomes. Additionally, field trips will offer participants the opportunity to learn about the project's progress and initial results. In fall 2025, partners and stakeholders will be invited to join a field trip to the Vesta Creek and/or the other restoration site. During this trip, they will learn about the study design and compare it with other research sites, fostering knowledge exchange and collaborative learning. We will specifically work with collaborators from the Minnesota DNR, Nick Proulx and others, to ensure that lessons learned from this study are directly implemented into future restoration projects. Through these outreach and education activities, our goal is to raise awareness, build capacity, and inspire collective action towards floodplain restoration efforts in the region. We also plan to engage students from the University of Minnesota and possibly Winona State University in the project as well.

Activity Milestones:

Description	Approximate Completion Date
Lead one partner field trip to research sites by end of 2025	December 31, 2025
Conduct workshop on findings and the riparian adaptation approach	December 31, 2027
Submit article for publication	June 30, 2028

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Nick Proulx	Minnesota Department of Natural Resources (DNR)	Nick will provide review of the study and participate in the workshops. He helped us design the stream restoration project at Vesta Creek which we'll be studying. Most importantly he can take lessons learned and implement them in restoration projects led by the DNR.	No
Marcella Windmuller-Campione	University of Minnesota - Forest Resources	Science review and input. Dr. Windmuller-Campione is a professor in Forest Resources and led a prevous study on riparian adaptation plantings along the Mississippi River. She may utilize the sites in some of the labs for her UMN classes.	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.
As outlined in our education and outreach section, we will organize a public workshop, conduct field trips, and produce 1-2 publications. The workshop will focus on sharing project goals, methodologies, and proposed outcomes. Additionally, field trips will offer participants the opportunity to learn about the project's progress and initial results. In fall 2025, partners and stakeholders will be invited to join a field trip to the Vesta Creek and/or the other restoration site. During this trip, they will learn about the study design and compare it with other research sites, fostering knowledge exchange and collaborative learning. We will specifically work with collaborators from the Minnesota DNR, Nick Proulx and others, to ensure that lessons learned from this study are directly implemented into future restoration projects. Through these outreach and education activities, our goal is to raise awareness, build capacity, and inspire collective action towards floodplain restoration efforts in the region. We also plan to engage students from the University of Minnesota and possibly Winona State University in the project as well. The Environment and Natural Resources Trust Fund will be acknowledged through use of the trust fund logo or attribution language on PowerPoint presentations that I do at the university or conferences. We may also construct a sign at Vesta Creek where we would place the ENRTF logo.

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?
TNC is currently developing a climate adaptation strategy in the Driftless area which will help carry the lessons learned from this study forward. We are working with the Minnesota DNR, local government units and the University of Minnesota to implement findings and direct related research, outreach and education. A series of field trips and workshops in 2025-26 will help extend the findings to other groups. The lessons learned from this project will be presented at conferences. More importantly, we'll collaborate with partners that are already working on climate adaptation strategies within the Driftless Area to promote the strategy.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Community Response Monitoring for Adaptive Management	M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 03r	$483,000

Quantifying Environmental Benefits of Peatland Restoration in Minnesota	M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 08l	$754,000

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Restoration Scientist		Lead all aspects of study, coordinating work of junior researchers, fellows and technicians. He will coordinate between the University of Minnesota and TNC staff as well. The water quality sampling plan will be led developed by the restoration scientist. The TNC restoration technician and graduate student (through contract) will collect samples and send to the RAL for analysis.			44.86%	0.16		$16,232
TNC Science Fellow or Scientist		The fellow or scientist will lead the riparian plant surveys and work with the University of Minnesota graduate student. TNC has science fellows for 2-3 year time periods.			44.86%	0.5		$48,521
Program Manager for Conservation or Resilient Waters		The Conservation Program Manager for the Driftless Area, David Ruff, coordinates restoration and protectoin efforts in the region for TNC. He will participate in meetings. Most importantly he'll take lessons learned from the study and apply them to projects in the Driftless Region.			44.86%	0.02		$1,970
Restoration Technician		Coordinate field work, this person is based in Winona and will focus on the vegetation monitoring and assesment and occasonal checking on monitoring equiplment as well as collecting water quality samples			44.86%	0.06		$4,764
Hydrologic Restoration Technician II		Assist with hydrologic monitoring and water quality sampling			44.86%	0.06		$6,293
Freshwater Intern		Assist with data collection focusing on hydrologic monitoring and sediment assessment.			13.12%	0.14		$5,430
							Sub Total	**$83,210**
Contracts and Services								
University of Minnesota, Department of	Subaward	The money will be used to fund a graduate student and some time from a research professor 2 years. Since Dr. Lenhart has a joint position with the University of Minnesota, we have found this will be				1		$105,000

Bioproducts & Biosystems Engineering		the most cost-effective way to get the research done.						
University of Minnesota - Research Analytical Lab (RAL)	Internal services or fees (uncommon)	We will send samples to the University's RAL for sediment and nutrient concentrations to determine the benefits of the restoration study site compared to the other two sites. Phosphorus and organic matter analyses will be done at the lab, as well as other potential pollutants of concern.				0		$10,000
							Sub Total	**$115,000**
Equipment, Tools, and Supplies								
	Tools and Supplies	Plant Survey Supplies (GPS, quadrents, cutting and storage gear)	need for riparian plant assessment					$2,000
	Tools and Supplies	Soil Kits (auger, deposition measurement pads, bins/cans)	to assess soil erosion and deposition rates within floodplains at study sites					$2,000
	Tools and Supplies	Water level data loggers to place in floodplain, 15 total (4 study locations x 5 per location)) at $550 each	he water levelloggers and barometric loggers are for recording water level at the floodplains of each study site					$11,000
	Tools and Supplies	barometric loggers (Solinst or Hobo brand) 2 total at $500 each (1 per study site)	to correct water level data, the Barologgers are needed					$1,000
	Equipment	mounted wildlife camera for pictures at high flow	obtain confirmation of water levels during flood conditions					$1,000
	Tools and Supplies	water-proof notebooks and other supplies for surveying	gear needed for field work					$500
	Equipment	topographic survey gear	to obtain cross sections to measure bank erosion or deposition at study sites					$2,250
							Sub Total	**$19,750**
Capital Expenditures								
		Area-velocity loggers to measure stream discharge at each study site. We will purchase 3 loggers at $7500 each for a total of $22,500	We will purchase hydrologic monitoring equipment to measure the flow in the streams at each study site. Each datalogger measures the depth and velocity of flow. Cost is $7500 each	X				$16,000

							Sub Total	**$16,000**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	40 trips to site for data collection, survey and assessment at $200 per trip from Twin Cities to Fillmore County, MN	travel to resaerch sites					$7,000
	Conference Registration Miles/ Meals/ Lodging	present at meeting	to disseminate research					$1,500
							Sub Total	**$8,500**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
	Publication	producing copies of publication for distribution	producing copies of publication for distribution					$40
	Publication	publication fees charged by journal	to get paper published on research					$500
							Sub Total	**$540**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$243,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Capital Expenditures		Area-velocity loggers to measure stream discharge at each study site. We will purchase 3 loggers at $7500 each for a total of $22,500	The equipment is required to monitor streamflow for the research study. There is no device that does this that is under the $5000 capital expense limit. **Additional Explanation :** Each streamflow monitoring device will be used to monitor flow at the two study sites through the length of the study. Additional years of monitoring data will be collected if the equipment is still working

Non ENRTF Funds

Category	Specific Source	Use	Status	$ Amount
State				
			State Sub Total	**-**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**-**

Total Project Cost: $243,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: 701a18ae-1ba.pdf

Alternate Text for Visual Component

A low-tech approach to restoring connectivity and increasing resilience to climate changes in Driftless Area streams is shown. A photo of Vesta Creek is shown that is currenlty entrenched and will be restored in 2024. We will study the adaptation approach, traditional restoration and a control site....

Financial Capacity

Title	File
TNC financial statement	21a6f35e-f05.pdf

Board Resolution or Letter

Title	File
TNC Director authorization letter	36955f46-a7f.pdf

Supplemental Attachments

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

Title	File
2025-270 Research Addendum revised_Final	d60e7368-b14.docx

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

I added detail to the workplan and milestones, but did not make any changes to the proposed study plan. I did shift some of the funding for different equipment and supply categories but the total amount did not change.

In February 2025, I added details to address comments on the acknowledgement of funding and the analysis of water samples and submitting to RAL.
In June 2025, I changed the end date to June 30, 2028 as noted in the LCCMR staff comments. I adjusted some of the project dates to reflect the later due date. No major work plan changes were made.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

Yes

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 project:

Sydnie Petteway, TNC and Auste Eigirdas, TNC, there will be University of Minnesota staff and students participating in the project via contract

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