

Environment and Natural Resources Trust Fund

2026 Request for Proposal

General Information

Proposal ID: 2026-462

Proposal Title: Managing Driftless Ecosystems After Invasive Shrub Removal

Project Manager Information

Name: Ellen Titus Organization: The Nature Conservancy Office Telephone: (651) 316-4534 Email: ellen.titus@tnc.org

Project Basic Information

Project Summary: We will expand hypothesis-driven research of target and non-target effects of invasive shrub management into the Driftless and create a system to track projects and outcomes over time

ENRTF Funds Requested: \$514,000

Proposed Project Completion: June 30, 2031

LCCMR Funding 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.

Invasive shrubs like buckthorn and bush honeysuckles negatively impact Minnesota's ecosystems; outcompeting native species, reducing ecosystem function, and impeding prescribed fire efforts. Typically when management actions are taken to remove invasive shrubs a new problem arises: re-growth of invasive shrubs or establishment of other invasive plants capitalizing on the open canopy, requiring follow-up management.

Research on follow-up management in Minnesota has overwhelmingly occurred in central Minnesotan forests, and these emerging best practices may not scale to bluff prairies and forests of the Driftless region. In addition, in the rare cases that Driftless management projects include post-project monitoring, that monitoring tends to focus on direct effects to plant communities over short time scales. We therefore lack assessment of indirect effects of shrub management to broader ecosystem functions and assessment of plant communities over longer time scales.

A final gap in invasive shrub management in the Driftless is the lack of a central reporting system for managers to monitor, evaluate, and learn from their projects over time. A system without consistent metrics especially complicates monitoring management projects where multiple partners collaborate on initial shrub control and later follow-up management, a common model in the driftless.

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.

Our project will bring an evaluation and monitoring framework to turn short-term reduction of invasive shrub biomass and stem counts into long-term ecosystem change towards native plant communities in the Driftless. We have sites across southeastern Minnesota with a history of management for invasive shrubs including prescribed fire, chainsaw removal, herbicides, goat grazing, and seeding grasses which we can use to investigate the most effective methodologies.

Our study will measure invasive shrub re-growth and native plant community establishment after management to help land stewards decide the best use cases for varying management and follow-up management combinations. This research will take place over a five-year time frame to capture initial ecosystem metrics immediately after management and follow those same metrics through time. Our study also examines the effects of shrub management on local microclimate and soil carbon for a more holistic approach to invasive shrub science and ecosystems.

The first steps to create an adaptive management tool for managers to the Driftless is creating a centralized system and common methods for project tracking. Our project will develop this tool, and the research on direct and indirect effects of shrub management will function as a pilot test of this system.

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?

Building off past work by The Nature Conservancy, Minnesota Department of Natural Resources, and other non-profit partners to manage habitats in the Driftless, we will provide evidence for the best practices to ensure shrub removal and habitat enhancement are long-term accomplishments of projects contributing to the preservation and enhancement of Minnesota's forests and bluff prairies. Our piloted research-backed framework to help managers collect management information and plant community data will expand the conservation and enhancement of habitats across the region during and after the project by centralizing data collection for invasive shrub projects.

Activities and Milestones

Activity 1: Measuring the direct effects of invasive shrub management on plant communities

Activity Budget: \$260,417

Activity Description:

Using sites managed by both non-profits and the Department of Natural Resources across Fillmore, Houston, Winona, Olmsted, and Wabasha counties, the monitoring coordinator and Winona State University (WSU) will use metrics of shrub density, size, and health to track efficacy of shrub management using different treatments (hand clearing, herbicide treatment, goat grazing, prescription fire, and post-treatment seeding). The Nature Conservancy (TNC) and WSU will work together in 2026 to determine the best metrics to assess direct effects, using previous LCCMR funded monitoring research in the Driftless and previous literature to determine the best metrics for monitoring shrub management effectiveness and native plant richness and community health. TNC and WSU will also choose sites in summer and fall of 2026 to include in the analysis where management history is known and that capture any upcoming invasive shrub management during the project to capture pre-management and post-management data when available. In subsequent years, TNC and WSU will continue to monitor shrub removal projects from the first field season and capture any additional projects that start during the study. After each field season data will be analyzed by both TNC and WSU.

Activity Milestones:

Description	Approximate Completion Date
First partial field season to scout sites and methods for direct assessment of management effects	November 30, 2026
WSU and TNC finalize sites and metrics to measure direct effects	May 31, 2027
First full field season, TNC and WSU monitor plant communities	November 30, 2027
Second full field season, TNC and WSU monitor plant communities	November 30, 2028
Third full field season, TNC and WSU monitor plant communities	November 30, 2029
Fourth and final full field season, TNC and WSU monitor plant communities	November 30, 2030
All data on direct effects analyzed and reports on direct effects of shrub management written	June 30, 2031

Activity 2: Measuring the indirect effects of shrub management on carbon and climate

Activity Budget: \$61,150

Activity Description:

TNC conducted a pilot survey of managed and unmanaged bluff prairies in the Driftless in the summer of 2024 and found that soil carbon storage and microclimate (temperature and humidity) varied based on management history. Prescription burned and intact bluff prairies stored more carbon and were hotter and drier than unmanaged bluffs, but bluffs with goat management- which was used on a site with an extensive invasive shrub problem-varied widely between the two extremes. Additionally, the hotter, drier bluffs had fewer invasive plant species and more native species. This pilot study highlighted a need for more sample locations and a greater examination of soil carbon and microclimate post invasives management in the Driftless. A TNC scientist will collect temperature and humidity data and soil cores in three consecutive summers at the same sites as Activity 1 and analyze the soil cores for soil carbon and nutrient content. Analysis and report writing will be conducted by TNC science team.

Activity Milestones:

Description	Approximate Completion Date
Sites selected for soil carbon analysis	December 31, 2026
First summer of soil carbon and microclimate data collection completed	September 30, 2027

Second summer of soil carbon and microclimate data collection completed	September 30, 2028
Third summer of soil carbon and microclimate data collection completed	September 30, 2029
All soil carbon and microclimate data analyzed and report written	June 30, 2030

Activity 3: Creating a central system for management reporting and monitoring for partners in the driftless

Activity Budget: \$192,433

Activity Description:

Land managers in the Driftless have been asking for a tool to bridge the gap between management science and practice in the field. One of the first steps towards a tool that can track invasive and native vegetation over time, provide an assessment of current habitat conditions, and posits recommendations on the best management methods to achieve habitat objectives is to build the framework and collect data to get a comprehensive baseline across partners, sites, and projects. TNC will create a system which collects geographical data on past and current management in the field using ArcGIS Online during the first winter. This system will use a subset of the metrics from Activity 1 to track invasive and native vegetation over time, using Survey123 and Field Maps applications to collect data in the field. TNC will pilot this tool in the field during the first full field season. This tool will be presented to local land managers for feedback after the first field season. Following the next three field seasons the tool will be continually revised, incorporating manager feedback and data from Activity 1. The final product will collect management and monitoring data and share between all Driftless land managers.

Activity Milestones:

Description	Approximate Completion Date
TNC develops pilot tool using metrics from first partial field season	May 31, 2027
Pilot tool tested on field sites for the first full field season	November 30, 2027
Tool presented to land managers in the driftless for review	April 30, 2028
Second field season test complete	November 30, 2028
Third field season test complete	November 30, 2029
Third and final field season test complete	November 30, 2030
System and tool packaged for use by Driftless land managers and shared	April 30, 2031

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Austin Yantes	Winona State University	Supervises undergraduate students from Winona State University helping to collect data in the field, and consults on scientific study design and data analysis	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?

Our system for collecting management and monitoring data will be shared with partners and implemented in the Driftless to coordinate and centralize project management and will be housed on TNC servers representing no additional cost after this project. Ultimately, we would like to expand this tool to different regions of the state as we believe that this tool fills a gap that many managers and scientists have identified in invasive shrub control. The expansion of this tool could use internal non-profit funding or include a second phase of funding from LCCMR.

Other ENRTF Appropriations Awarded in the Last Six Years

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

Project Manager and Organization Qualifications

Project Manager Name: Ellen Titus

Job Title: Adaptive Management Research Specialist

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

Ellen Titus has a master's degree in Biological Sciences from East Carolina University with a thesis in quantitative community ecology and a decade's experience working in the biological sciences. Ellen has gained skills designing, conducting, analyzing, and publishing research over this career. Ellen is also the monitoring coordinator for a LCCMR award funded to The Nature Conservancy (TNC) entitled 'Community Response Monitoring for Adaptive Management' in the southeastern Minnesota Driftless area, ending June 2026. This award for \$483,000 establishes a monitoring framework to determine how management- or lack of management- affects the plant and animal communities of Driftless bluff prairies. In this role Ellen has partnered with Minnesota Department of Natural Resources (DNR) staff, managed a large subaward to the DNR, hired and managed field technicians, and supervised much of the project workflow and activity tracking. Ellen also creates or modifies existing monitoring protocols, conducts fieldwork on plant and animal communities, analyzes data, writes reports, and develops positive working relationships with on-the ground land managers working for both the DNR and TNC and other non-profits in the role, skills that will directly transfer to the proposed project. Finally, this previous LCCMR award has resulted in an in-depth knowledge of Driftless ecosystems and the plant communities within them.

Organization: The Nature Conservancy

Organization Description:

Founded in 1951, The Nature Conservancy is a global conservation organization dedicated to conserving the lands and waters on which all life depends. Guided by science, we create innovative, on-the-ground solutions to our world's toughest challenges so that nature and people can thrive together. We are tackling climate change, conserving lands,

waters and oceans at unprecedented scale, providing food and water sustainably and helping make cities more sustainable. We use a collaborative approach that engages local communities, governments, the private sector, and other partners.

Budget Summary

Category /	Subcategory	Description	Purpose	Gen.	%	#	Class	\$ Amount
Name	or Type			Ineli	Bene	FTE	ified	
Personnel				gible	TITS		Staff?	
Project		Loads fieldwork, analysis, collaboration with			11 69%	2		\$107.691
Coordinator		nartners dissemination GIS tool framework design			44.00%	2		\$197,081
coordinator		and project reporting						
Soil Carbon		Collect cores of soil samples from the field collect			44 68%	03		\$38 550
Scientist		climate data process samples and coordinate			44.0070	0.5		<i>\$</i> 30,330
Solentise		laboratory analysis of carbon, and analyze dat						
GIS and Data		TNC in-house GIS specialist will assist in analysis of			44.68%	1.4		\$154,252
Specialist		field data and creation of ArcGIS Online framework						
		for data collection and visualization for Activity 3						
Fieldwork		Summer technician hired to assist with field data			11.94%	1		\$60,755
Assistant		collection for Activity 1 during the summer						
							Sub	\$451,238
							Total	
Contracts								
and Services								
Winona	Subaward	Professor at Winona State University Austin Yantes				0.2		\$20,000
State		will assist with providing fieldwork experiences for						
University		undergraduate students supporting Activities 1 and						
		3, coordinating summer project students,						
		supervising students in the field, and consulting on						
	Sonvico	Analysis for three year's carbon coil camples at a						¢19.600
	Contract	Analysis for three years carbon son samples at a				-		\$18,000
	Contract	$\frac{1}{2}$ $\frac{1}$						
		shipping and handling or laboratory additional						
		processing fees per year, repeated thrice for three						
		summers with soil carbon sample collection						
							Sub	\$38,600
							Total	
Equipment,								
Tools, and								
Supplies								
	Tools and	Plant surveying supplies	Plant community surveying supplies					\$662
	Supplies		for fieldwork supporting Activity 1					

	Tools and Supplies	Soil carbon and climate surveying supplies	Soil carbon core collection and climate			\$2,000
	Supplies		supporting Activity 2			
					Sub Total	\$2,662
Capital Expenditures						
					Sub Total	-
Acquisitions and Stewardship						
					Sub Total	-
Travel In Minnesota						
	Miles/ Meals/ Lodging	Mileage from Winona to field sites in the Driftless, 80 miles a day with 75 trips a year totaling 6,000 miles per year at a mileage rate of \$0.70 per mile, for five field seasons	Field work at sites around the driftless to collect data for Activities 1 and 2 and pilot test tool in Activity 3			\$21,000
					Sub Total	\$21,000
Travel Outside Minnesota						
					Sub Total	-
Printing and Publication						
	Printing	Printing	Printing final report and booklet explaining tool for distributing to local land managers			\$500
					Sub Total	\$500
Other Expenses						
					Sub Total	-
					Grand Total	\$514,000

Classified Staff or Generally Ineligible Expenses

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

Non ENRTF Funds

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

Total Project Cost: \$514,000

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component File: c1e3fcda-b91.pdf

Alternate Text for Visual Component

Map showing Driftless sites where shrub management has occurred or will occur. Previous projects have been led by TNC, DNR, or non-profit partners, and future sites with planned shrub management projects during the time frame led by TNC are also pictured....

Financial Capacity

Title	File
Secretary of State Good Standing	<u>1cee313c-4d5.pdf</u>
Most Recent IRS 990	fb5c27b1-b06.pdf
Most Recent Audit	3cb47daa-df2.pdf

Board Resolution or Letter

Title	File
Approval from TNC Director	<u>3f4aa535-670.docx</u>
TNC Delegation of Authority from Board to Director	<u>33752a4f-0fb.pdf</u>

Supplemental Attachments

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

Title	File
Support Letter-Yantes	<u>9ac9e0e7-03e.pdf</u>

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:

Megan Wilcots (The Nature Conservancy), Marya McIntosh (The Nature Conservancy), April Yoder (The Nature Conservancy), Kaitlyn Bottorff(The Nature Conservancy), Austin Yantes (Winona State University)

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

Yes, I understand