



# Environment and Natural Resources Trust Fund

## 2025 Request for Proposal

### General Information

**Proposal ID:** 2025-239

**Proposal Title:** Enhancing the Value of Minnesota Public Grasslands

### Project Manager Information

**Name:** Eric Mousel

**Organization:** U of MN - College of Food, Agricultural and Natural Resource Sciences

**Office Telephone:** (218) 513-0781

**Email:** emmousel@umn.edu

### Project Basic Information

**Project Summary:** Evaluate prescribed fire, brush mowing and targeted conservation grazing to develop ready-to-use management strategies for public lands managers to mitigate woody species encroachment in public grasslands.

**ENRTF Funds Requested:** \$390,000

**Proposed Project Completion:** June 30, 2028

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

### Project Location

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

Region(s): NW

**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

## Narrative

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

Greater than 95% of Minnesota's prairies have been lost to the plow and development. Many of the remaining acres of native and restored grasslands have been degraded from lack of fire and the spread of invasive woody species. Woody plant (i.e. brush and trees) encroachment in grasslands is a hallmark trait of climate change but tends to be exacerbated by improper management. The Tallgrass Aspen Parkland (TAP) is an ecoregion located in southeastern Manitoba and northwestern Minnesota. This boreal-grassland transition zone is a zone of constant competition and tension as prairie and woodlands struggle to overtake each other within the parkland. The Caribou Wildlife Management Area (CWMA), located within the TAP in northwestern Minnesota has experienced significant levels of brush encroachment into their respective grassland components resulting in reduced wildlife and pollinator habitat quality, shifts in ecological feedback loops and loss of biodiversity. The objectives of this study will be to evaluate the effect of high density grazing following prescribed fire and/or mechanical brush removal on reducing woody species density. The results will create more sustainable management practices that promote vegetation diversity, improve soil health and benefit the environment on public lands for the benefit of all Minnesotans.

### **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 propose to conduct field trials at CWMA and CWR to evaluate the effect of different combinations of prescribed burning, mechanical brush mowing and livestock grazing on mitigation of brush species encroachment into grassland, vegetation species diversity, and carbon sequestration. This project aims to develop ready-to-use landscape management systems that successfully and consistently allow MNDNR managers to mitigate brush encroachment in grasslands, increase species diversity through disturbance and increase carbon sequestration on public lands in the northern half of the state.

### **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?**

This project aims to evaluate applied field research to advance the sustainable management of public lands management in MN. The outcomes of the project include mitigating brush encroachment in grasslands, increasing species diversity through disturbance and helping to mitigate atmospheric greenhouse gas emissions by increasing carbon sequestration on public lands. These outcomes will enhance the experience of stakeholders on public lands, particularly MNDNR Wildlife Management Areas by promoting sustainable management systems that can be enjoyed by all Minnesotans for generations to come.

## Activities and Milestones

### Activity 1: Brush encroachment mitigation strategies

**Activity Budget:** \$292,000

**Activity Description:**

Field trials will be conducted at CWMA and CWR near Lancaster, MN. A prescribed fire will be conducted by MN DNR burn crew on both sites. Following prescribed fire, grassland areas will be brush-mowed to remove woody species not burned in the fire. Cattle from a neighboring ranch will be used to graze regrowth to maintain vegetation balance.

**Activity Milestones:**

Description	Approximate Completion Date
Evaluate landscape management strategies' effect on woody species density.	June 30, 2028
Develop new management strategies to combat brush encroachment in grasslands.	June 30, 2028

### Activity 2: Vegetation diversity evaluation

**Activity Budget:** \$50,000

**Activity Description:**

Vegetation diversity indices will be measured before trial establishment and again after application of land management treatments. From this we will be able to determine the effect of these management tool combinations on changes in vegetation diversity.

**Activity Milestones:**

Description	Approximate Completion Date
Determine changes in vegetation diversity following application of different land management treatments.	June 30, 2028
Evaluate effect of management strategies on habitat quality indices and pollinator species richness	June 30, 2028

### Activity 3: Carbon sequestration

**Activity Budget:** \$48,000

**Activity Description:**

Field trials established for brush encroachment mitigation will be used for this purpose. Soil carbon stocks will be measured before trial establishment and again after application of land management treatments. From this we will be able to determine the effect of these management tool combinations on carbon sequestration potential and total carbon stocks.

**Activity Milestones:**

Description	Approximate Completion Date
Determine total carbon stocks before and after application of different land management treatments.	June 30, 2028
Determine carbon sequestration potential of public grasslands	June 30, 2028

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Jason Wollin	MN DNR	Collaborator	No
Jacob Anderson	The Nature Conservancy	Collaborator	No

## 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?**

Results from this proposal will support training programs for public lands managers and public stakeholders to understand the necessity of applying land management tools on public lands to sustain their utility into the future. This project will provide information for policy makers to develop legislation and agency rule-making that supports environmentally sound management techniques for enhancing the experience of stakeholders in their enjoyment of public lands. Previous, current and future work have been supported by state and federal agencies and the U of M. Federal and state agencies will be the primary targets for funding for future work as needed.

## Project Manager and Organization Qualifications

**Project Manager Name:** Eric Mousel

**Job Title:** Assistant Professor / Beef Systems Specialist

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

Dr. Eric Mousel holds a Ph.D. in Range Science and Management from the University of Nebraska - Lincoln and has been researching grazing ecology and targeted conservation grazing for nearly 20 years. Dr. Mousel's primary areas of interest include sustainable grazing management, primarily in the area of conservation grazing; modeling the positive impacts of conservation grazing under different climate change scenarios and the ecology of conservation grazing, soil carbon sequestration and soil health. Dr. Mousel has published over 1,000 scientific and popular press articles on these topics. The overall objective of his research is to enhance the viability of agro-ecosystems of the upper Great Plains, Northern High Plains and Prairie Pothole Regions. He is a member of The Ecological Society of America, The Nature Conservancy, The Society of Rangeland Ecology and Management and the American Society of Animal Science.

**Organization:** U of MN - College of Food, Agricultural and Natural Resource Sciences

**Organization Description:**

Higher Education Institution

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Principal investigator		Management of project implementation and execution			37.1%	0.6		\$81,720
Masters level graduate student		Oversee field trials and support data collection			25.1%	3		\$127,005
							<b>Sub Total</b>	<b>\$208,725</b>
<b>Contracts and Services</b>								
TBD	Professional or Technical Service Contract	mowing brush at research sites				0.25		\$125,000
TBD	Professional or Technical Service Contract	Laboratory fees for soil C lab analysis				0.25		\$21,000
TBD	Professional or Technical Service Contract	Travel between data collection points in the field				0.3		\$6,000
							<b>Sub Total</b>	<b>\$152,000</b>
<b>Equipment, Tools, and Supplies</b>								
	Tools and Supplies	Vegetation sampling supplies (4 sets of clippers, collection bags)	Collecting vegetation data					\$1,500
	Tools and Supplies	Soil probes, containers and storage (2 soil probes, soil boxes, storage containers)	Collecting soil samples for C analysis					\$1,500
	Tools and Supplies	GPS supplies (2 units)	Permanent, non-physical marking of data collection points					\$1,050
							<b>Sub Total</b>	<b>\$4,050</b>
<b>Capital Expenditures</b>								

							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	Trips from Grand Rapids to research sites at Caribou WMA in NW MN (6 per year, 3-4 people))	Establish field experiments, data collection and present results as required by LCCMR					\$19,225
							<b>Sub Total</b>	<b>\$19,225</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
	Printing	Printing of reports and bulletins	Materials for concurrent and post-project outreach events					\$2,500
	Publication	Publication of scientific manuscripts (2 expected)	Cost of publication of scientific findings					\$3,500
							<b>Sub Total</b>	<b>\$6,000</b>
<b>Other Expenses</b>								
							<b>Sub Total</b>	-
							<b>Grand Total</b>	<b>\$390,000</b>

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				
			State Sub Total	-
Non-State				
			Non State Sub Total	-
			Funds Total	-

Total Project Cost: \$390,000

This amount accurately reflects total project cost?

Yes



## Attachments

### Required Attachments

#### *Visual Component*

File: [7c504cb6-354.pdf](#)

#### *Alternate Text for Visual Component*

Aerial photo of proposed research site at Caribou WMA and Carbiou Woodland Reserve in NW MN...

### Supplemental Attachments

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

Title	File
UMN Authorization Letter	<a href="#">24c98989-2ad.pdf</a>
Support Letter - The Nature Conservancy	<a href="#">648999e8-015.pdf</a>
MN GLCA	<a href="#">2dda3f75-f8e.pdf</a>

## 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?**

Yes, Sponsored Projects Administration

**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:**

Kelsey Grachek

