



Environment and Natural Resources Trust Fund

2023 Request for Proposal

General Information

Proposal ID: 2023-101

Proposal Title: Completing Installment of the Minnesota Ecological Monitoring Network

Project Manager Information

Name: Erika Rowe

Organization: MN DNR - Ecological and Water Resources Division

Office Telephone: (651) 259-5134

Email: erika.rowe@state.mn.us

Project Basic Information

Project Summary: The Ecological Monitoring Network will install the final 250 plots. Data are needed to understand how climate change is impacting Minnesota and identify resilient natural lands for conservation or enhancement.

Funds Requested: \$1,160,000

Proposed Project Completion: June 30, 2026

LCCMR Funding Category: Air Quality, Climate Change, and Renewable Energy (E)

Project Location

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

Statewide

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

Statewide

When will the work impact occur?

During the Project

Narrative

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

The Ecological Monitoring Network is Minnesota's first, and only, state-wide monitoring project collecting statistically rigorous data on native biodiversity. Most of the existing data collected on Minnesota's native plant communities were collected for the purpose of documenting where they occur across our state, as well as quality and abundance; not for understanding how they were changing over time. Data collected from the monitoring network will help us understand and quantify how a broad range of native plant communities are adapting in response to multiple stressors including climate change, an increased frequency of extreme weather events, and the spread of invasive species. This in turn will inform resilient and sustainable conservation and enhancement practices in light of climate change. MN Climate Action Framework's Initiative 2.2 specifically recognizes conserving and enhancing native biodiversity as critical to adapt to climate change. Furthermore, this network includes all landownerships - another step toward engaging all Minnesotans in our effort to mitigate and adapt to climate change.

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.

This proposal will install the final 250 plots, for a total of 600 randomly placed monitoring plots throughout the state. This entire plot network will provide scientifically rigorous statewide data for analyses and reports to inform ongoing management and conservation questions, in particular long-term strategies for enhancing the climate adaptation potential of Minnesota's natural lands. Each individual plot provides data on native plant biodiversity and threats such as invasive species specific to that native plant community that are immediately useful to the landowner to inform conservation decisions. The final network, though intended to be long term, will also provide immediate information useful to informing landscape level goals and priorities. For example, identifying hotspots of invasive plant species encroachment across Minnesota, describe the relationship between invasive earthworm infestation and native plant biodiversity, and describe the relationship between deer browse and tree regeneration. The established plots will also provide a foundation for academic researchers or other collaborators to expand on the base data. As the network is re-sampled over time (on a 7–8-year cycle), the data become more powerful in their ability to quantify how Minnesota's native plant communities are changing in response to the continued stressors created by climate change.

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?

Monitoring at temporal and geographic scales such as this are critical for assessing changes in our natural resources. For example, data may highlight how warming temperatures are influencing tree regeneration in our forests or how increased droughts are impacting wetlands throughout the state. The ENRTF has already supported the first two-thirds of this project's initial investment and this final installment would establish a vast statewide network of plots providing the State of Minnesota with a scientifically rigorous statewide dataset for making science-based decisions for sustainably conserving and enhancing resilient natural lands for the benefit of all Minnesotans into the future.

Activities and Milestones

Activity 1: Finalize Network with 250 New Plots

Activity Budget: \$1,060,000

Activity Description:

Install 250 new plots to the existing network of 350 plots completed from current and previous appropriations. Data will be collected on all plant species. Variables such as deer browse, coarse woody debris, water chemistry, and grassland structure will also be collected depending on the type of plot. Plant collections will be processed and delivered to the UMN for accession in permanent collections.

Activity Milestones:

Description	Completion Date
Data collected at 250 newly established monitoring plots (80-85 plots each summer)	September 30, 2025
Data entered into the Ecological Monitoring Network Database	April 30, 2026
Specimen preparation and delivery of specimens to museum collections	June 30, 2026

Activity 2: Data Distribution, Education and Outreach

Activity Budget: \$100,000

Activity Description:

Results will be published on the DNR Ecological Monitoring Network website, including a written report that examines all data collected during the initial establishment of plots throughout the network. That report will summarize the variation in biodiversity and threats to native plant communities across Minnesota. Presentations to nonprofit organizations, natural resource managers, and universities will be made to inform audiences of monitoring results and recruit other researchers to build upon the network. Specific outreach efforts will be made to distribute the summary report to landowners and stakeholders. Reports including individual site data will also be sent to the landowners or managers of the land where each site is located.

Activity Milestones:

Description	Completion Date
Annual summary reports distributed to landowners or managers after each field season	February 28, 2025
A summary report using all network plots will be written and distributed to stakeholders.	June 30, 2026
Conduct public outreach and technical guidance activities.	June 30, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Division of Forestry	MN DNR	Help with initial project objectives, providing help with land access, staffing in the field.	No
Division of Parks and Trails	MN DNR	Help with initial project objectives and study design, providing help with land access, staffing in the field.	No
Division of Wildlife	MN DNR	Help with initial project objectives and study design, providing help with land access, staffing in the field.	No
The Nature Conservancy	The Nature Conservancy	Help with initial project objectives and study design, access to land and providing help with land access, staffing in the field, potential collaboration with additional research at plots on their land.	No
College of Food, Agricultural and Natural Resource Sciences	University of Minnesota	Staff, primarily within the Department of Forest Resources helped with original study design and objectives. We see potential for future research or statistical analysis collaboration on monitoring plots. Data collection on lichens and mosses has already begun at a select number of our plots by U of MN researchers.	No
US Fish and Wildlife Service	Dept of the Interior	Helped with initial study design and objectives, assistance with land access and permits, potential future partner for additional research on plots placed on their land.	No
US Forest Service	Department of Agriculture	Helped with initial study design and objectives, assistance with land access and permits, potential collaborator on future additional research on plots within their ownership.	No
National Park Service	Department of the Interior	Consultation on initial project objectives and study design.	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?

The DNR is actively developing long-term cooperative funding for sustaining this Ecological Monitoring Network over time. Resampling plots will take considerably less time and resources compared to initial installation, and will be incorporated into the work of the DNR MBS Program.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Statewide Monitoring Network for Changing Habitats in Minnesota	M.L. 2016, Chp. 186, Sec. 2, Subd. 03d	\$500,000
Expanding Minnesota Ecological Monitoring Network	M.L. 2021, First Special Session, Chp. 6, Art. 5, Sec. 2, Subd. 03b	\$800,000

Project Manager and Organization Qualifications

Project Manager Name: Erika Rowe

Job Title: Research Scientist

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

I am a trained botanist/plant ecologist who has worked for the MN DNR since 2001. I have been the coordinator for the

Ecological Monitoring Network since its inception in 2016 and have been responsible for designing the field data collection protocols and developing the database to store the monitoring data. I have also been the lead in coordinating project logistics such as landowner contacts and permits, training staff, safe field operations, and ensuring the data is entered and quality checked annually.

Organization: MN DNR - Ecological and Water Resources Division

Organization Description:

The Ecological and Water Resources Division is one of seven divisions within the DNR. Its mission is focused on Ecosystem Management and Protection, Inventory, Monitoring and Analysis, and Conservation Assistance and Regulation. The Minnesota Biological Survey (MBS), a program housed within this Division, has been responsible for leading the Ecological Monitoring Network. The Minnesota Biological Survey systematically collects, interprets, monitors and delivers data on plant and animal distribution as well as the ecology of native plant communities and functional landscapes.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Plant Ecologist / Botanists – Int. & Sr.		Vegetation data collection, synthesis, planning and leading field plot installation.			28%	4.5		\$435,000
Plant Ecologist / Botanist		Support for in-field plot installation and vegetation data collection			27%	4		\$265,000
Interns		Seasonal field support for plot installation			0%	1.5		\$60,000
Project Manager		Project records and document management, landowner and partner coordination, project business management			28%	0.4		\$30,000
Information Outreach Specialist		Maintain project website, data outreach, posting updated reports and materials			30%	0.4		\$45,000
							Sub Total	\$835,000
Contracts and Services								
TBD	Professional or Technical Service Contract	Contracting with a field botanist(s) with advanced plant identification skills to help install plots				-		\$150,000
							Sub Total	\$150,000
Equipment, Tools, and Supplies								
	Equipment	Field equipment will be reused from previous projects to the extent possible. Additional supplies needed may include meter tapes, waterproof notebooks, insect/tick repellent, safety vests; plot marking supplies such as rebar, magnets and magnetized nails, tree tags; measuring tools such as tree calipers, rulers, water chemistry meters and calibration supplies, pvc pipes for marking plots in	Necessary for either marking the plots permanently, collecting data or specimens					\$15,000

		wetlands, compasses, GPS receivers; plant specimen collecting and preservation supplies.						
							Sub Total	\$15,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel for three 3-person crews for 2 field seasons to install and sample monitoring plots; 200 field days, 30,000 miles. Vehicles (\$14,100), lodging (\$54,000), and meals (\$6,600) in accordance with the Commissioner's Plan.	Each team will require one vehicle (3 total) for the summer to access plots across the state; Each team will need access to lodging/hotels while in transit during the week; and reimbursement for meals while in transit.					\$74,697
							Sub Total	\$74,697
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
		Direct and necessary costs to cover HR support (\$19,688), Safety Support (\$3,967), Financial Support (\$14,421), Communication Support (\$1,811), IT Support (\$44,396), and Planning Support (\$1,020).	These funds are needed to pay other DNR personnel for things like HR and IT.					\$85,303
							Sub Total	\$85,303
							Grand Total	\$1,160,000

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				
Cash	Heritage Enhancement Fund	Funds the Research Scientist/Coordinator (Lead for the project), as well as other staff support	Pending	\$300,000
Cash	General Fund dollars	Supervision, project oversight, guidance and other staff support	Pending	\$50,000
			State Sub Total	\$350,000
Non-State				
Cash	Federal State Wildlife Grant appropriations	Much of the proposed ENRTF funds qualify as State match for these appropriations.	Pending	\$100,000
			Non State Sub Total	\$100,000
			Funds Total	\$450,000

Attachments

Required Attachments

Visual Component

File: [f30bd43f-682.pdf](#)

Alternate Text for Visual Component

Statewide map showing the location of plots already established from past appropriations, future plots with 2023 appropriation, and a depiction of what the plot layout looks like on the ground....

Administrative Use

Does your project include restoration or acquisition of land rights?

No

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

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

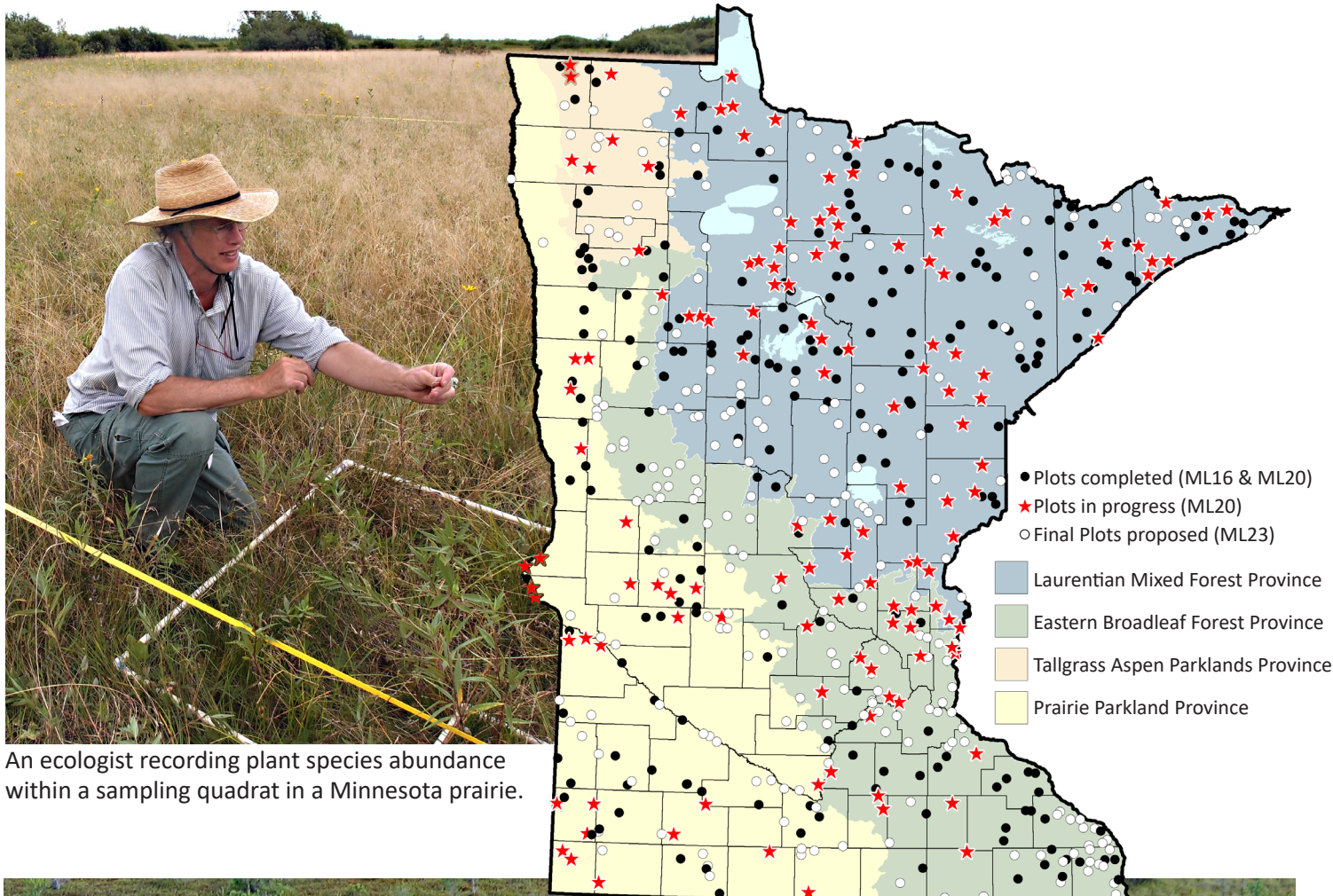
Does the organization have a fiscal agent for this project?

No

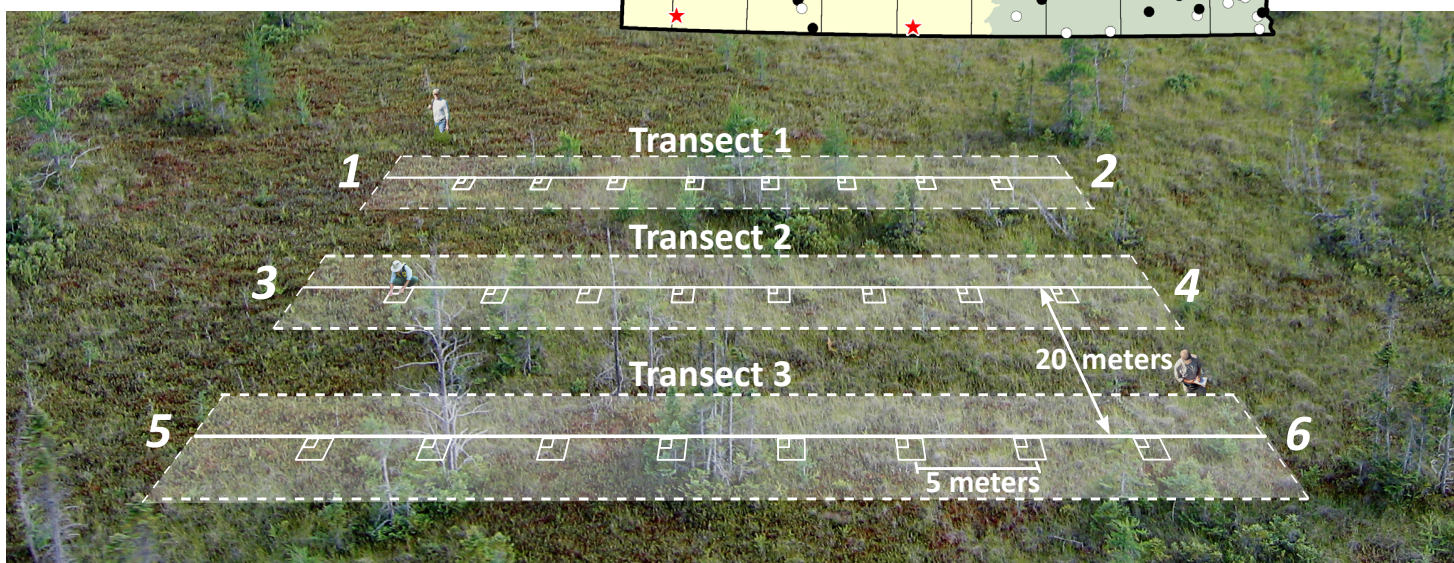
Completing Installment of the Minnesota Ecological Monitoring Network

Improving land use decision making and sustainable resource management through greater reliance on scientific knowledge

MBS Proposal, Activity 1: Finalize Network with 250 New Plots



An ecologist recording plant species abundance within a sampling quadrat in a Minnesota prairie.



A scale diagram of the plot, showing three 45-meter transects along which vegetation, soils, water chemistry, deer browse, and other measurements