



Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-426

Proposal Title: Expanding the Minnesota Ecological Monitoring Network

Project Manager Information

Name: Erika Rowe

Organization: MN DNR - Ecological and Water Resources Division

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Project Basic Information

Project Summary: This project proposes to expand the Ecological Monitoring Network by establishing an additional 500 plots to inform the conservation and management of Minnesota's native forests, wetlands, and grasslands.

Funds Requested: \$1,587,000

Proposed Project Completion: 2024-06-30

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?

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.

Most of the information collected on Minnesota's native plant communities was from surveys done at a single point in time. Invaluable as this data is, it was not collected for the purpose of repeatable or comparative analysis. While this information establishes a critical foundation for an understanding of the types and amounts of native plant communities we have and where they occur, it does not provide information about how plant communities change through time. The information collected by this project will provide objective, ground-based data collected systematically over time across many different ownerships and native plant communities from randomly selected, permanently marked plot locations. Our statistically designed protocols, which have been tested during the first phase of this project, are intended to provide detailed information on all plant species present at plot locations, from the ground layer to the canopy; something that other similar projects are not doing. In addition, information on bees and butterflies will also be collected at a limited number of plots that use these native plant communities. We also hope to further expand additional data collection on other taxa going forward such as soils and mosses.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

Information from the resurvey of these established monitoring plots can serve as a kind of early warning system about the effects of invasive species, extreme weather, land use changes, and other stressors on native vegetation. Informed decisions about how to best manage and conserve native habitats rely on detailed vegetation data collected from these kinds of monitoring plots, something that is currently not available. This project will complete work begun by the Minnesota Biological Survey Program (MBS) with 2016 ENRTF funding to design a monitoring program to track status and trends in Minnesota's prairies, forests and wetlands. With the help of many collaborators, methods were developed and tested, and the first 100 of 600 monitoring plots were installed to begin building the Ecological Monitoring Network. This network of plots is designed to be available to others conducting ecological and related research in Minnesota. Already, collaborators at the University of Minnesota are sampling lichens and mosses on a subset of these plots, and efforts to attract additional collaborators will continue. The goal of this project is to provide detailed, integrated data on the status and trends of Minnesota's native habitats in formats that will be available to interested users.

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 data gathered on vegetation and other metrics from monitoring plots in this network will be available to natural resource agencies, organizations, landowners, and the public. Examples of results from this project that could inform management and conservation decisions include the effects of warming temperatures on prairies and wetlands, impacts from earthworms and buckthorn on forests, shifts in dominant canopy trees in forests, and the effects of increased flooding in wetlands. We will install an additional 500 plots to reach the minimum number of plots necessary to provide scientifically valid, repeatable statewide data and deliver project results in several formats.

Activities and Milestones

Activity 1: Complete Installation of 500 New Plots

Activity Budget: \$1,487,000

Activity Description:

Install 500 new plots to the existing network of 100 plots established in the ML16 project. Data will be collected on all plant species, and depending on the plant community type of each plot, variables such as deer browse, coarse woody debris, water chemistry, and grassland structure will be collected. Our current database will be expanded in order to link to our existing Natural Heritage Information System, so that data will be more easily accessible to the public. Data collected will be entered into the database at the end of each field season. Plant and insect collections will be processed and delivered to the UMN for accession in permanent collections.

Activity Milestones:

Description	Completion Date
Database developed and incorporated into the Natural Heritage Information System	2021-04-30
Data collected at 500 newly established monitoring plots (166 plots each summer)	2023-09-30
Data entered into the Ecological Monitoring Network Database	2024-02-28
Specimen preparation and delivery of specimens to museum collections	2024-06-30

Activity 2: Data Distribution, Education and Outreach

Activity Budget: \$100,000

Activity Description:

Results will be published on the DNR Ecological Monitoring Network website. Report forms including Individual site data will be sent to the owners or managers of the land where each site is located. A written report summarizing all of the collected data will be available on the website. Presentations to nonprofit organizations, natural resource managers, and universities will be made to inform audiences of monitoring results and recruit other researchers to use the network.

Activity Milestones:

Description	Completion Date
Annual summary reports distributed to landowners or managers after each field season	2024-02-28
Conduct public outreach and technical guidance activities.	2024-06-30
Descriptions of the project's methods, initial findings posted on project website	2024-06-30

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
U.S. 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
U.S. Fish & Wildlife Service	Department 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
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
The Nature Conservancy	The Nature Conservancy	Help with initial project objectives and study design, providing help with land access, staffing in the field, potential collaboration with additional research at plots on their land.	No
Division of Fish and Wildlife	MN DNR	Help with initial project objectives and study design, 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 Forestry	MN DNR	Help with initial project objectives, providing help with land access, staffing in the field.	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 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

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 and have 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 worker for

several field staff, coordinating seasonal logistics and ensuring the data is entered and quality checked annually and sending out landowner data.

Organization: MN DNR - Ecological and Water Resources Division

Organization Description:

The Ecological and Water Resources Division is one of seven divisions within the DNR. It's 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		Field and Data Leads			28%	1.5		\$480,000
Plant Ecologist/Botanist		Field and Data Specialist			27%	3		\$540,000
Soil scientist		Field and Data Specialists			27%	0.24		\$70,000
Invertebrate Ecologist		Field and Data Specialists			27%	0.3		\$116,000
Data/Specimen Manager		Data specialist			27%	0.06		\$16,000
Information Outreach Specialist		Data delivery and outreach manager			30%	0.06		\$16,000
							Sub Total	\$1,238,000
Contracts and Services								
MN Information and Technology Services (MN IT)	Professional or Technical Service Contract	Service level agreements for project database development and enhancement, website development				0.9		\$35,000
							Sub Total	\$35,000
Equipment, Tools, and Supplies								
	Equipment	Field equipment will be reused from previous projects to the extent possible. Additional supplies needed include meter tapes, waterproof notebooks, insect/tick repellent, safety vests; plot marking supplies such as rebar, magnets and magnetized nails, witness tree tags; measuring tools such as tree calipers, rulers, water chemistry meters and calibration supplies, pvc pipes for marking plots in wetlands, compasses, GPS receivers; plant, insect, soil specimen collecting and preservation supplies.	Supplies needed for three 3-person crews for three field seasons to collect data and permanently mark 500 monitoring plots					\$10,000

							Sub Total	\$10,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Travel for three 3-person crews for three field seasons to install and sample monitoring plots; 450 field days, 72,000 miles. Vehicles (\$38,000), lodging (\$157,000), and meals (\$5,000) 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.					\$199,866
							Sub Total	\$199,866
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
		Direct and necessary costs to cover HR support (\$23679), Safety Support (\$4,286), Financial Support (\$17,323), Communication Support (\$1,388), IT Support (\$56,321), and Planning Support (\$1,138).	These funds are needed to pay other DNR personnel for things like HR and IT.					\$104,134
							Sub Total	\$104,134
							Grand Total	\$1,587,000

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.	Pending	\$304,000
Cash	General Fund dollars	Supervision, project oversight, guidance	Pending	\$100,000
			State Sub Total	\$404,000
Non-State				
Cash	Federal State Wildlife Grant appropriations	Much of the proposed ENRTF funds qualify as State match these appropriations.	Pending	\$100,000
Cash	US Forest Service additional funds	Money to support the project and install additional plots on Superior National Forest lands.	Pending	\$15,000
			Non State Sub Total	\$115,000
			Funds Total	\$519,000

Attachments

Required Attachments

Visual Component

File: [6add069-d21.pdf](#)

Alternate Text for Visual Component

Statewide map showing the location of plots already established with ML 2016 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 patent, royalties, or revenue potential?

No

Does your project include research?

Yes

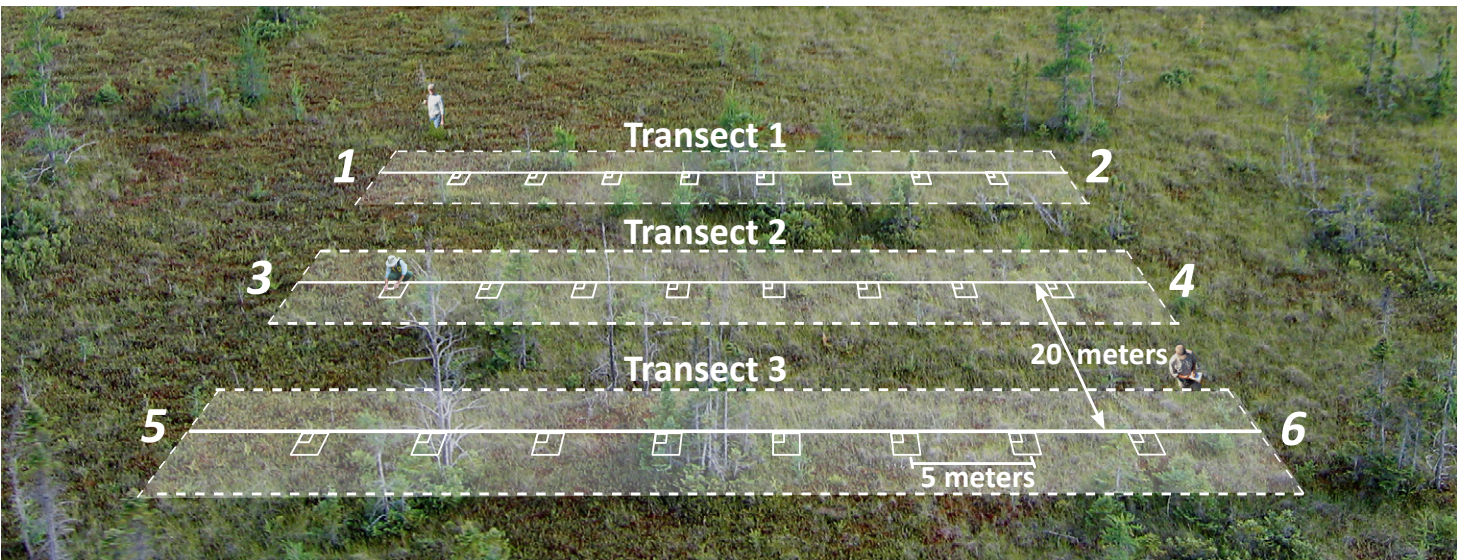
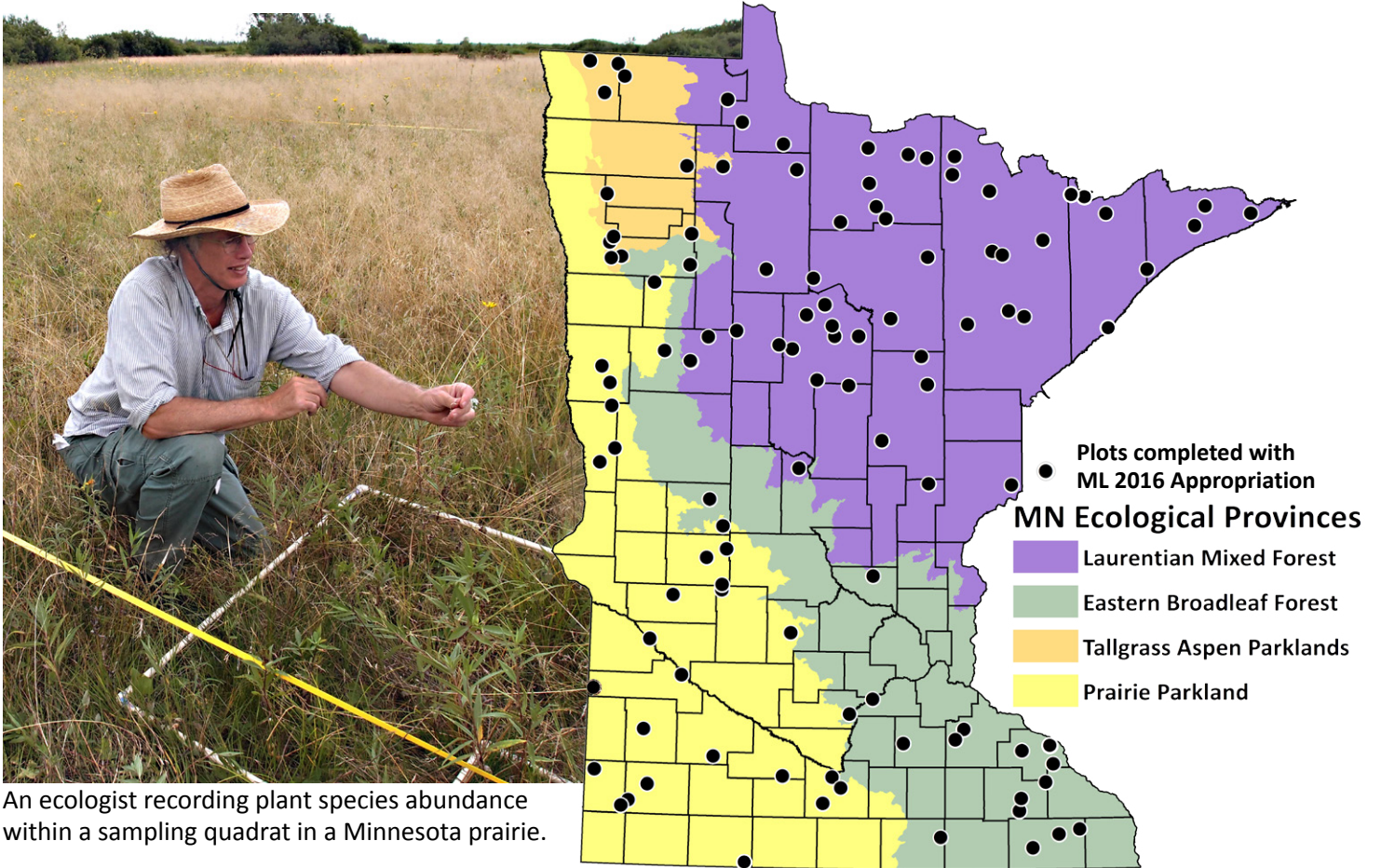
Does the organization have a fiscal agent for this project?

No



Expanding the Minnesota Ecological Monitoring Network

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



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

