# Environment and Natural Resources Trust Fund

2022 Request for Proposal

## General Information

**Proposal ID:** 2022-238

**Proposal Title:** Expanding The Minnesota Ecological Monitoring Network

## Project Manager Information

**Name:** Erika Rowe

**Organization:** MN DNR - Ecological and Water Resources Division

**Office Telephone:** (651) 259-5134

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## Project Basic Information

**Project Summary:** This project proposes to expand the Ecological Monitoring Network by establishing an additional 250 plots to inform the conservation and management of Minnesota's native forests, wetlands, prairies.

**Funds Requested:** $800,000

**Proposed Project Completion:** June 30 2025

**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, including from the metropolitan area. 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.

**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 plant communities, effects of increased flooding on wetlands, impacts from earthworms and other invasives on forests, and documenting changes in dominant canopy trees in forests. We will Install a minimum 250 plots to help reach the minimum number of plots needed to provide scientific, repeatable statewide data and deliver project results in several formats.

# Activities and Milestones

## Activity 1: Complete Installation of 250 New Plots

**Activity Budget:** $750,000

**Activity Description:**
Install 250 new plots to the existing network of 125 plots established in the ML16 project. Data will be collected on all plant species, and depending on the vegetation type of each plot, variables such as deer browse, course woody debris, water chemistry, and grassland structure will be collected. A new database will be developed and added to the 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 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 | April 30 2023 |
| Data entered into the Ecological Monitoring Network Database | February 28 2024 |
| Data collected at 250 monitoring plots | September 30 2024 |
| Specimen preparation and delivery of specimens to museum collections | June 30 2025 |

## Activity 2: Data Distribution, Education and Outreach

**Activity Budget:** $50,000

**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 | February 28 2025 |
| Descriptions of the project's methods, initial findings posted on project website | June 30 2025 |
| Conduct public outreach and technical guidance activities. | June 30 2025 |

## 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 Fish and 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, 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 |
| 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 |
| 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 |

## 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 it's 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% | 2.25 | | $240,000 |
| Plant Ecologist/Botanist | | Field and Data Specialist | | | 27% | 4.5 | | $270,000 |
| Interns | | Field and Data Entry | | | 0% | 2.25 | | $70,200 |
| Data/Specimen Manager | | Data specialist | | | 27% | 0.03 | | $8,000 |
| Information Outreach Specialist | | Data delivery and outreach manager | | | 30% | 0.03 | | $8,000 |
| | | | | | | | **Sub Total** | **$596,200** |
| **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 3 field seasons to install and sample monitoring plots; 225 field days, 36,000 miles. Vehicles ($19,000), lodging ($76,511), and meals ($2,500) 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. | | | | | $98,011 |
| | | | | | | | **Sub Total** | **$98,011** |
| **Travel Outside Minnesota** | | | | | | | | |
| | | | | | | | **Sub Total** | **-** |
| **Printing and Publication** | | | | | | | | |
| | | | | | | | **Sub Total** | **-** |
| **Other Expenses** | | | | | | | | |
| | | Direct and necessary costs to cover HR support ($15,078), Safety Support ($2,335), Financial Support ($8,978), Communication Support ($1,311), IT Support ($32,079), and Planning Support ($1,008). | These funds are needed to pay other DNR personnel for things like HR and IT. | | | | | $60,789 |
| | | | | | | | **Sub Total** | **$60,789** |
| | | | | | | | **Grand Total** | **$800,000** |

## Classified Staff or Generally Ineligible Expenses

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

## 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: 6addd069-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 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

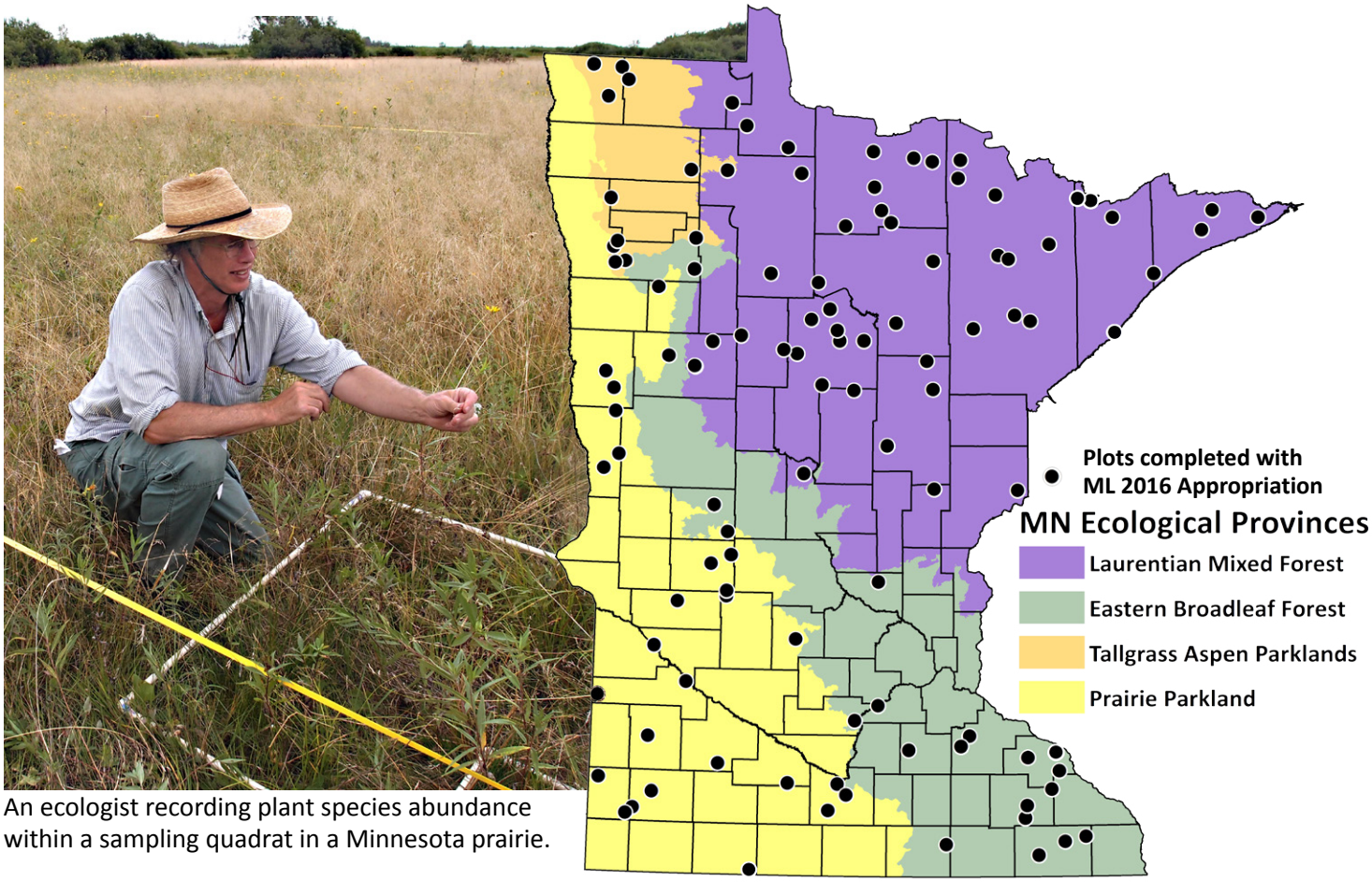
**Does the organization have a fiscal agent for this project?**

No

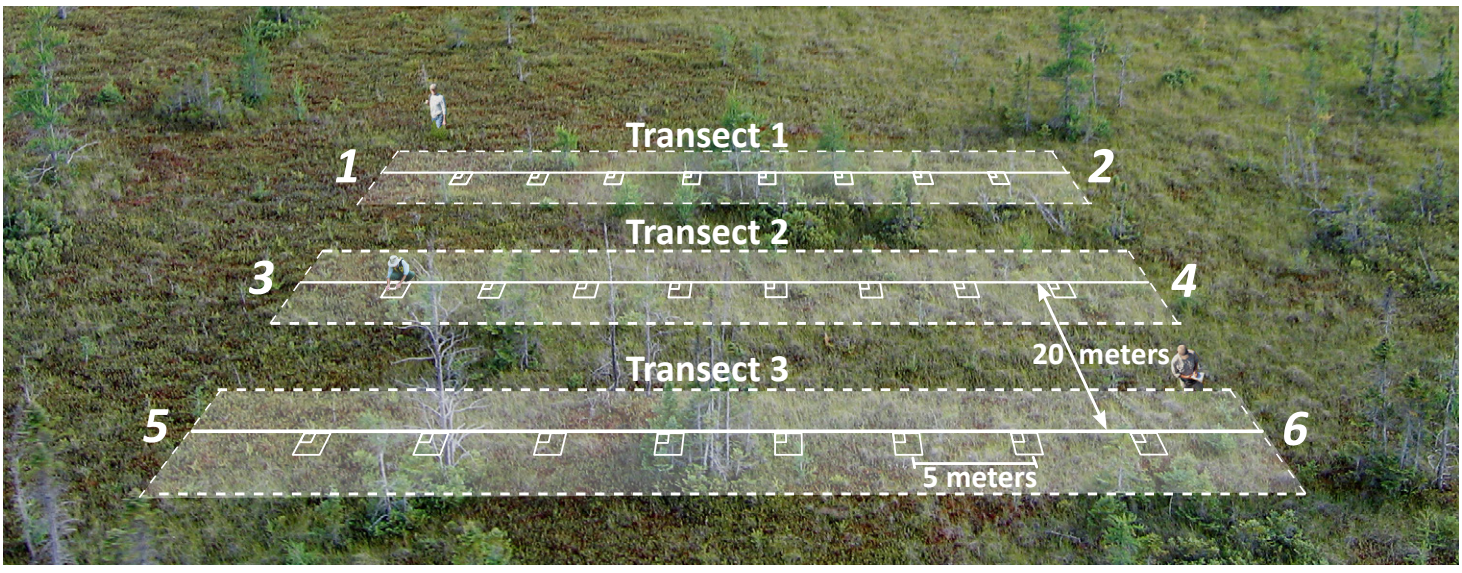
ENVIRONMENT AND NATURAL RESOURCES TRUST FUND

# Expanding the Minnesota Ecological Monitoring Network

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




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

DEPARTMENT OF NATURAL RESOURCES