



Environment and Natural Resources Trust Fund (ENRTF)

M.L. 2020 ENRTF Work Plan (Main Document)

Today's Date: November 21, 2019

Date of Next Status Update Report: April 1, 2021

Date of Work Plan Approval:

Project Completion Date: June 30, 2023

Does this submission include an amendment request? No

PROJECT TITLE: Expanding the Minnesota Ecological Monitoring Network

Project Manager: Hannah Texler

Organization: MN DNR – Minnesota Biological Survey

College, Department, or Division: Division of Ecological and Water Resources

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Project Manager Direct Telephone Number: 651 259-5048

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Web Address: <https://www.dnr.state.mn.us/mbs/ecologicalmonitoring/index.html>

Location: Statewide

Total Project Budget: \$800,000

Amount Spent: \$0

Balance: \$800,000

Legal Citation: M.L. 2020, Chp 186, Sec. 2, Subd. 002A

Appropriation Language:

PROJECT STATEMENT:

This project proposes to expand the Ecological Monitoring Network by adding 250 plots to inform the conservation and management of Minnesota's native forests, wetlands, and grasslands.

Most of the information collected on Minnesota's native plant communities was collected at one point in time. 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 provided by this project will provide empirical, ground-based data collected systematically over time.

The data gathered on vegetation and other metrics from monitoring plots in this network will be available to natural resource agencies and organizations, landowners, and the public. Monitoring results 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 carefully collected data. Examples of results that could inform management and conservation decisions include the effects of warming temperatures on prairies, impacts from earthworms and buckthorn in forests, shifts in dominant canopy trees in hardwood forests, and the effects of increased flooding in wetlands.

This project will complete work begun by the Minnesota Biological Survey Program (MBS) with 2016 ENRTF funding (M.L. 2016, Chp 186, Sec. 2, Subd. 03d) to design and test methods for tracking and reporting 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.

Here we propose to:

- **Install an additional 250 monitoring plots** to reach the minimum number of plots necessary to provide scientifically valid, repeatable statewide data. These plots will be resampled every 5-6 years to track and interpret changes in native vegetation.
- **Collect key data** 1) on all plots: vegetation, wildlife habitat metrics, and forest stand metrics; and 2) on a subset of plots: plant-pollinator interactions; water chemistry and peat profiles; soil chemistry; and soil microbes and fungi.
- **Ensure that enough prairie plots are included** to adequately address the status and trends of these important communities.
- **Add plots in the seven-county metro area** to measure change in native vegetation in a major metropolitan area.
- **Deliver project results in several formats:** data that are accessible to the public, landowner specific site reports, and reports that summarize results from the network of plots to land managers, stakeholders, and the public.

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 end-goal of this project is detailed, integrated data and information on the status and trends of Minnesota's native habitats in formats that will be immediately available to a wide range of users.

II. OVERALL PROJECT STATUS UPDATES:

First Update April 1, 2021

Second Update October 1, 2021

Third Update April 1, 2022

Fourth Update October 1, 2022

Fifth Update April 1, 2023

Final Report between project end (June 30) and August 15, 2023

III. PROJECT ACTIVITIES AND OUTCOMES:

ACTIVITY 1: Collect field data on native vegetation

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, coarse 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 1 ENRTF BUDGET: \$750,000

Outcome	Completion Date
1. New database developed and added to the Natural Heritage Information System	4/1/2021
2. Data collected at 250 monitoring plots	9/30/2022
3. Data entered into the Ecological Monitoring Network Database	2/28/2023
4. Specimen preparation and delivery of specimens to museum collections	6/30/2023

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ACTIVITY 2: Data Distribution, Education and Outreach

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 2 ENRTF BUDGET: \$50,000

Outcome	Completion Date
<i>1. Annual summary reports distributed to landowners or managers after each field season</i>	<i>2/28/2023</i>
<i>2. Descriptions of the project's methods & initial findings posted on project website</i>	<i>6/30/2023</i>
<i>3. Public outreach and technical guidance activities completed</i>	<i>6/30/2023</i>

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Fourth Update October 1, 2022

Fifth Update April 1, 2023

Final Report between project end (June 30) and August 15, 2023

IV. DISSEMINATION:

Description:

All of the information on the web page for this project will be continually updated, including revised brochures, revisions to the Standard Operating Procedures, and information from data analyses. The web site address is: <https://www.dnr.state.mn.us/mbs/ecologicalmonitoring/index.html>

Reports summarizing data collected in each plot will continue to be sent to the respective landowner or land manager for each plot following each field season.

PowerPoint presentations will be revised and presented at a number of venues to make natural resource managers, scientists, and the general public aware of this project.

The Minnesota Environment and Natural Resources Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the [ENRTF Acknowledgement Guidelines](#).

First Update April 1, 2021

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Fifth Update April 1, 2023

V. ADDITIONAL BUDGET INFORMATION:

A. Personnel and Capital Expenditures

Explanation of Capital Expenditures Greater Than \$5,000:

Equipment purchased with this appropriation will be used to continue to establish and sample Ecological Monitoring Network plots for the duration of the EMN project, which is expected to extend several decades into the future.

Explanation of Use of Classified Staff: N/A

Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:

Enter Total Estimated Personnel Hours for entire duration of project: 56,628	Divide total personnel hours by 2,080 hours in 1 yr = TOTAL FTE: 27.225
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Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:

Enter Total Estimated Contract Personnel Hours for entire duration of project:	Divide total contract hours by 2,080 hours in 1 yr = TOTAL FTE:
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VI. PROJECT PARTNERS:

- A. Partners outside of project manager's organization receiving ENRTF funding: None.
- B. Partners outside of project manager's organization NOT receiving ENRTF funding:

The DNR MBS Program will lead this project with support from the following collaborators: DNR Divisions of Forestry, Ecological and Water Resources, Parks and Trails, and Fish and Wildlife; the Nature Conservancy (TNC); University of Minnesota (UMN); U.S. Forest Service (USFS); U.S. Fish & Wildlife Service (USFWS). This request does not include funding for the following: TNC, UMN, USFS, and USFWS.

VII. LONG-TERM- IMPLEMENTATION AND FUNDING:

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.

VIII. REPORTING REQUIREMENTS:

- Project status update reports will be submitted April 1 and October 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2023

IX. SEE ADDITIONAL WORK PLAN COMPONENTS:

A. Budget Spreadsheet

B. Visual Component or Map

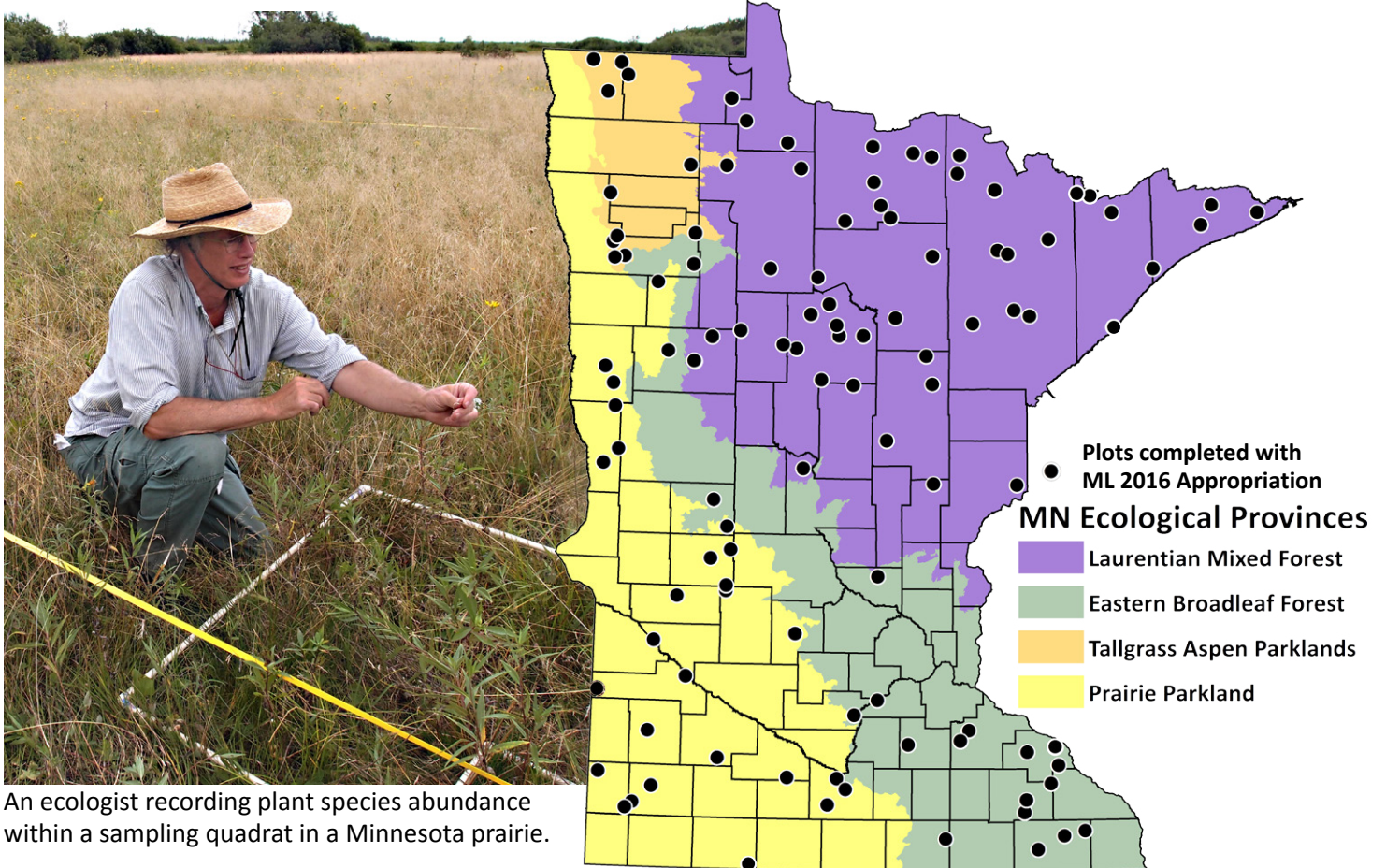
Attachment A: Project Budget Spreadsheet**Environment and Natural Resources Trust Fund****M.L. 2020 Budget Spreadsheet****Legal Citation:** M.L. 2020, Chap. 186, Sec. 2, Subd. 002A**Project Manager:** Hannah Texler**Project Title:** Expanding the Minnesota Ecological Monitoring Network**Organization:** MN DNR**Project Budget:** \$800,000**Project Length and Completion Date:** 3 years - June 30, 2023**Today's Date:** November 21, 2019

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET		Budget	Amount Spent	Balance
BUDGET ITEM				
		\$ 596,200	\$ -	\$ 596,200
Plant Ecologist/Botanists, Field and Data Leads, \$240,000 (72% salary 28% benefits), 0.75 FTE each year for 3 years.				
Plant Ecologist/Botanists, Field and Data Specialists, \$270,000 (73% salary, 27% benefits), 1.5 FTE each year for 3 years.				
Interns, \$70,200 (100% salary), .75 FTE each year for 3 years				
Data/Specimen Manager, \$8,000 (73% salary 27% benefits), 0.0125 FTE each year for 3 years.				
Information Outreach Specialist, \$8,000 (70% salary, 30% benefits), 0.0125 FTE each year for 3 years.				
Professional/Technical/Service Contracts				
MN. IT service level agreements for project database and website development.		\$ 35,000	\$ -	\$ 35,000
Equipment/Tools/Supplies				
Field equipment will be reused from previous projects to the extent possible. Supplies needed for three 3-person crews for 1.5 field seasons to collect data at monitoring plots, including tapes, plot markers, waterproof notebooks, insect/tick repellent, safety vests, rebar, magnets, magnails, witness tree tags, calipers, rulers, water chemistry calibration supplies, pvc pipes, compasses, GPS receivers, plant, insect, soil specimen collecting and preservation supplies.		\$ 10,000	\$ -	\$ 10,000
Travel expenses in Minnesota				
Travel for three 3-person crews for 1.5 field seasons to install and sample monitoring plots; 225 field days, 36,000 miles. Vehicles (\$19,000), lodging (\$76,838), and meals (\$2,500) in accordance with the Commissioner's Plan.		\$ 98,338	\$ -	\$ 98,338
Other				
Direct and necessary costs to cover HR support (\$13,908), Safety Support (\$2,517), Financial Support (\$8,429), Communication Support (\$1,388), IT Support (\$33,082), and Planning Support (\$1,138).		\$ 60,462	\$ -	\$ 60,462
COLUMN TOTAL		\$ 800,000	\$ -	\$ 800,000
SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT				
	Status (secured or pending)	Budget	Spent	Balance
Non-State:				
Federal: State Wildlife Grant appropriations. Much of the proposed ENRTF funds qualify as State match for these appropriations.	Pending	\$ 100,000	\$ -	\$ 100,000
State:				
Heritage Enhancement - Research Scientist Project Lead	Pending	\$ 304,000	\$ -	\$ 304,000
General Fund - Supervision, project oversight, guidance	Pending	\$ 100,000	\$ -	\$ 100,000
Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS				
	Amount legally obligated but not yet spent	Budget	Spent	Balance
M.L. 2016 Chap. 186 Sec. 02 Subd. 03d - Statwide Monitoring Network for Changing Habitats		\$ 500,000	\$ 500,000	\$ -

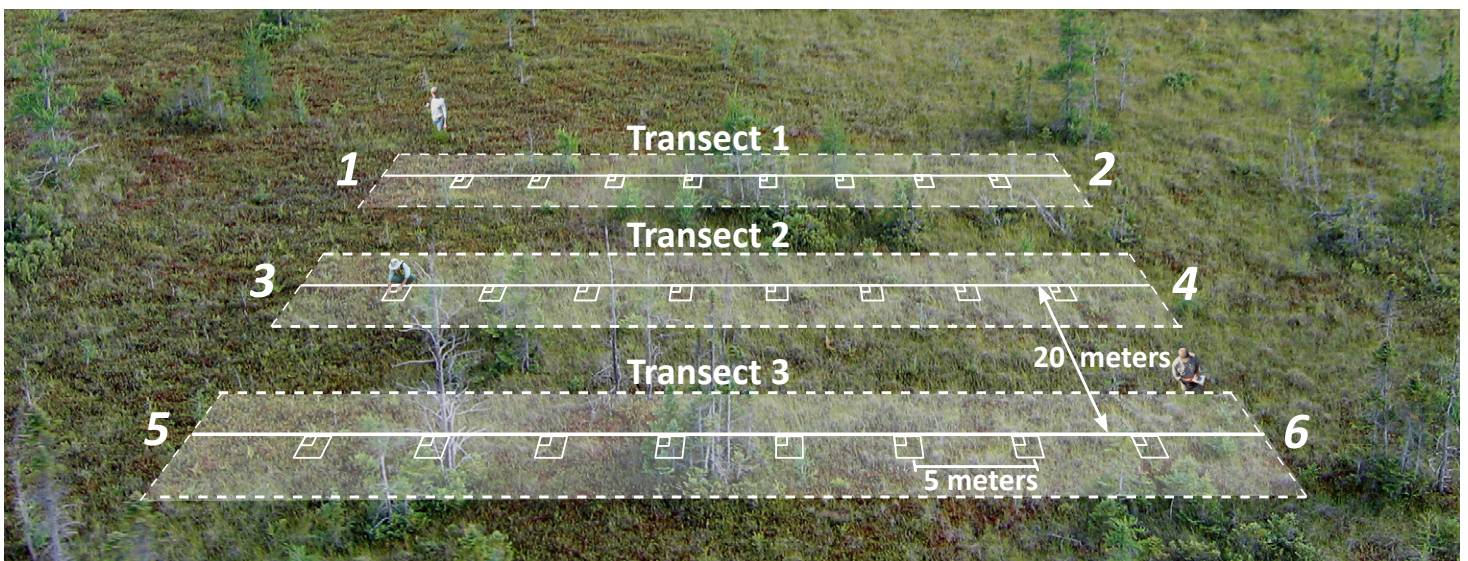


Expanding the Minnesota Ecological Monitoring Network

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