**PROJECT TITLE: Expanding the Minnesota Ecological Monitoring Network**

**I. PROJECT STATEMENT**

This project proposes to expand the Ecological Monitoring Network by adding 500 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 500 monitoring plots** to reach the minimum number of plots necessary to providescientifically 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.
* **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. PROJECT ACTIVITIES AND OUTCOMES**

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| **Activity 1: Complete Installation of 500 New Plots** **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 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 and insect collections will be processed and delivered to the UMN for accession in permanent collections.**ENRTF BUDGET: $**1,487,134 |  |  |  |  |
| **Outcome** | **Completion Date** |
| 1. *New database developed and added to the Natural Heritage Information System*
 | *4/1/2021* |
| 1. *Data collected at 500 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* |

**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.

**ENRTF BUDGET: $** 100,000

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| **Outcome** | **Completion Date** |
| *1. Annual summary reports distributed to landowners or managers after each field season* | *2/28/2023* |
| *2. Descriptions of the project’s methods, initial findings posted on project website.*  | *6/30/2023* |
| *3. Conduct public outreach and technical guidance activities.*  | *6/30/2023* |

**III. PROJECT PARTNERS AND COLLABORATORS:**

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. Collaborators include DNR zoologists under separate funding who will be collecting data on bees, moths, and overall insect diversity on a subset of our plots.

**IV. 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.

**V. SEE ADDITIONAL PROPOSAL COMPONENTS:**

**A. Proposal Budget Spreadsheet**

**B. Visual Component or Map**

**F. Project Manager Qualifications and Organization Description**