



# Environment and Natural Resources Trust Fund

## 2024 Request for Proposal

### General Information

**Proposal ID:** 2024-186

**Proposal Title:** Modernizing Minnesota's Plant Community Classification and Field Guides

### Project Manager Information

**Name:** Bruce Carlson

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

**Office Telephone:** (651) 259-5083

**Email:** bruce.carlson@state.mn.us

### Project Basic Information

**Project Summary:** Update the state's 20-year-old native plant community classification guides to incorporate new data; streamline user application and access to products; and increase connections to evolving climate and vegetation trends.

**Funds Requested:** \$1,800,000

**Proposed Project Completion:** June 30, 2027

**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 and In the Future

## Narrative

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

Published in 2003, the DNR Native Plant Community (NPC) Classification and associated field guides are used every day throughout Minnesota for vegetation management, conservation, and land-use planning. The classification and guides provide a common language for vegetation conservation, management, and decision-making among multiple DNR divisions; federal agencies including the U.S. Forest Service, Natural Resources Conservation Service, National Park Service, and U.S. Fish and Wildlife Service; County land departments; nonprofit organizations; educators; researchers; and environmental consultants.

The classification was developed by analyzing over 5,000 vegetation samples collected in Minnesota between 1964 and the early 2000s. In the 20 years since publication, over 5,000 more vegetation samples have been collected in Minnesota, many of them during ENRTF-supported surveys by the Minnesota Biological Survey (MBS) and by DNR Forestry, Parks & Trails, and Fish & Wildlife and external partners. This work has filled important geographic and ecological gaps in the vegetation plot data. MBS and all these parties have also mapped over 4.7 million acres of plant communities across the state, adding more information on plant community ranges and status.

### **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.**

We will produce a new and improved native plant community classification system for Minnesota. This new product will address many of the issues and requests for changes and improvements identified by users of the classification over the past 20 years and will incorporate 20 years of new vegetation data collection and mapping data. We will include analysis of climate and other environmental change and threat data to produce new information that helps us understand the condition of plant communities today and how they are trending into the future.

We are proposing ENRTF funds to help us:

- 1) Manage and coordinate a complex project involving iterative data analysis and review by multiple DNR Divisions and external government, NGO, and research partners;
- 2) Collect field data that address specific gaps in our vegetation plot and soils data identified during use of the classification since 2003 (e.g., river shores, young and middle-aged forests, ecotones that separate prairie wetlands from wet prairies) and other gaps identified during data analysis; and
- 3) Develop and deliver new plant community fact sheets, updated field keys, and a digital tool for classifying user-collected plant community data.

### **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?**

Information and materials developed under this project will be delivered through existing DNR websites and social media channels, training activities, and technical and educational material developed to assist and train users of the classification. To meet the need to manage and conserve plant communities in a changing climate, we will produce new resources that interpret NPCs relative to climate change. With the addition of new data, decades of user experience, and a collaborative development process, the new plant community classification will greatly improve our abilities to conserve and enhance the state's native vegetation and wildlife habitats into the future.

## Activities and Milestones

**Activity 1: Coordinate and manage a data analysis and product development project involving multiple partners and agencies.**

**Activity Budget:** \$260,000

**Activity Description:**

Form and manage an inter-agency project team of partners to help identify relevant sources of data, guide data collection and analysis, and develop and review final products. Create a process for all classification users to provide input on revisions, contribute ideas for improved and new features and tools, and receive updates on progress.

**Activity Milestones:**

Description	Approximate Completion Date
Hire a project coordinator	September 30, 2024
Recruit project partners, form a team, and develop an overall project plan	December 31, 2024
Organize and host collaborative meetings and events among team members	June 30, 2027
Solicit, manage, and respond to user comments and inputs.	June 30, 2027

**Activity 2: Gather, prepare, and analyze new vegetation and environmental data, and incorporate results of analysis into the existing classification.**

**Activity Budget:** \$270,000

**Activity Description:**

Before starting data analysis, we will identify and enter any additional sources of vegetation plot data from partners. We will also identify other sources of relevant vegetation data (NPC mapping, DNR old-growth forest data), environmental data (updated geologic surveys and soil mapping, water chemistry, hydrology, climate), and GIS or modeling data (LiDAR, climate models) to assimilate into the analysis.

Preparation of vegetation plot data for analysis includes quality control and assuring datasets are representative and balanced geographically and ecologically across the range of plant communities in Minnesota. A preliminary assessment and summary of vegetation and environmental data will help us refine priorities for collection of additional vegetation plot data and environmental data during two field seasons (see Activity 3).

Analyses will involve iterative comparisons of vegetation plot data using a suite of classification tools (e.g., ordinations, indicator species analysis, cluster analysis, and others) to identify plant community distribution and classification patterns and understand factors driving them. We will also identify and examine associations of plant species data with climate and other environmental data and patterns.

**Activity Milestones:**

Description	Approximate Completion Date
Identify and enter vegetation plot data not currently in DNR relevé database.	June 30, 2025
Identify and incorporate other vegetation and environmental data into plot data analysis.	June 30, 2025
Prepare vegetation plot data for analysis (data qc and standardization)	September 30, 2025
Run iterative analyses to identify and examine plant community classification and distribution patterns.	December 31, 2026

**Activity 3: Work with partners to do targeted field work for two seasons to gather high priority vegetation plot and environmental data.**

**Activity Budget:** \$1,000,000

**Activity Description:**

Conduct two seasons of intensive and targeted field surveys to address high priority data gaps. Field surveys to include:

1. Vegetation samples in young to middle-aged forests; lake shore, river shore and nearshore plant communities; wet ash forest communities; and temporary wetlands
2. Sampling and description of soil profiles in forest, prairie, and wetland plant communities
3. Moss and liverwort surveys in wetlands and peatlands
4. Lichen surveys in cliff and rock outcrop plant communities
5. Vegetation samples to address questions and gaps identified during data analysis

**Activity Milestones:**

Description	Approximate Completion Date
Collect vegetation plot data (100 plots over two years)	September 30, 2026
Collect soils data (50 sites or profiles over two years)	December 31, 2026
Collect bryophyte data (mosses, liverworts, lichens) (100 sites over two years)	December 31, 2026
Enter data into DNR databases	June 30, 2027

**Activity 4: Produce and deliver updated classification products.**

**Activity Budget:** \$270,000

**Activity Description:**

DNR’s NPC websites will be updated with new field keys and fact sheets. Fact sheets will include updated NPC comparison tables, distribution maps, and plant species frequency and cover tables. We will also develop new information for forest growth stages, soils and surficial geology, wetland water chemistry and hydrology, climate change relationships, and pollinator relationships. We will create printable and tablet-ready addendums to accompany each of the existing field guidebooks. These addendums will feature the full sets of updated fact sheets and field keys for each of the three guidebooks.

New products will include tablet- and smartphone-based applications for use in field data collection in plant communities, and a new web-based classification tool that will enable users to enter and classify vegetation plot samples (and similar kinds of vegetation native plant community species lists) collected in the field. This new classification tool is in direct response to requests from users over the past 20 years.

**Activity Milestones:**

Description	Approximate Completion Date
Updated native plant community class fact sheets	June 30, 2027
Updated Ecological Classification System (ECS) Section field keys	June 30, 2027
Printable and tablet-ready addendums for each of three existing field guides	June 30, 2027
Digital vegetation classification tool for users to collect and classify vegetation plot samples	June 30, 2027

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Katie Freker, David Morley,	Superior National Forest	Vegetation and soil surveys and data analysis, project team members.	No
Jeffery Kroll, Kade Anderson	NRCS	Soil surveys and data analysis, ecological site descriptions, project team members	No
Cindy Heyd, Anna Plumb	Chippewa National Forest	Vegetation and soil surveys and analysis, project team members.	No
Paul Dubuque	MN DNR Division of Forestry	Ecological Classification System expertise, NPC silviculture applications, data analysis, project team member.	No
Ed Quinn, Tavis Westbrook	MN DNR Division of Parks & Trails	Vegetation data collection, analysis, management applications; project team members.	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?**

MN Biological Survey data, products, and technical guidance have proven critical and foundational to societal and scientific applications. MBS receives operational funding from General Fund, Heritage Enhancement Fund, and Reinvest in Minnesota Fund and project funding from ENRTF, Fish & Game Fund, State Wildlife Grants, and other federal funds. MBS will continue to address relevant needs and add value to existing ENRTF investments through statewide baseline biological surveys, biodiversity monitoring, outreach and product delivery, targeted field surveys to inform conservation planning and decisions, and surveys for under-surveyed taxa and ecological systems.

## Project Manager and Organization Qualifications

**Project Manager Name:** Bruce Carlson

**Job Title:** MN Biological Survey Program Supervisor

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

Bruce Carlson has been Supervisor of the MN Biological Survey (MBS) since 2015. He manages MBS budgets, priorities, and staff to survey, monitor, analyze, and disseminate information on Minnesota native biodiversity and ecological systems. Background and professional experience include extensive work in native plant community and native species field survey and mapping, ecological land management, project management, and collaborative natural resource and conservation planning. Bruce will provide overall project direction, budget management, staff supervision, work plans, and activity updates. In his capacity as MBS Program Supervisor and previous work experience, Bruce has demonstrated his ability to manage budgets, direct staff, coordinate with partners, and efficiently and effectively deliver project outcomes.

**Work Experience:**

2015 – present Program Supervisor, MBS, DNR Division of Ecological & Water Resources  
 2007 – 2015 NE Regional Plant Ecologist, DNR Division of EWR  
 1997 – 2007 Plant Ecologist/Botanist, MBS, DNR Division of EWR  
 1996 – 1997 Project Specialist, Wetlands Program, MN office, National Audubon Society  
 1995 – 1996 Field Research Assistant, University of MN, Dept. of Horticulture Science

1992 – 1995 Herbarium Curatorial Specialist, Bell Museum of Natural History, U of MN

Education

1995 Bachelor of Science, Biology, University of Minnesota

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

**Organization Description:**

The DNR Division of EWR Minnesota Biological Survey Unit systematically collects, interprets, and delivers baseline data on the distribution and ecology of native animals, plants, plant communities, and native landscapes. Delivery of these data helps guide management, conservation, and monitoring of critical habitat and ecological functions.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Project Coordinator		Coordinate and manage a data analysis and product development project involving multiple partners and agencies.			25%	3		\$255,000
Natural Resource Specialist SR		Field survey leads, data management and analysis, project team participation			25%	4.5		\$442,500
Natural Resource Specialist SR		Soil survey lead, data management and analysis, project team participation			25%	3		\$360,000
Natural Resource Specialist Intermediate		Field surveys, data management			25%	3		\$225,000
Information Officer		Product development and dissemination			25%	0.4		\$42,000
Data Manager		Enter data into DNR systems, prepare data for analysis			25%	0.4		\$30,000
							<b>Sub Total</b>	<b>\$1,354,500</b>
<b>Contracts and Services</b>								
MN.IT	Professional or Technical Service Contract	GIS and data application support				-		\$50,000
Contracts with Biologists	Professional or Technical Service Contract	Specialized biological surveys (e.g. young forest, mosses, lichens, fungi) and analysis				0		\$219,187
							<b>Sub Total</b>	<b>\$269,187</b>
<b>Equipment, Tools, and Supplies</b>								
							<b>Sub Total</b>	<b>-</b>

<b>Capital Expenditures</b>								
							<b>Sub Total</b>	-
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	-
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	Fleet, lodging, meal expenses while in travel status for field surveys and project team meetings.	Fleet, lodging, meal expenses while in travel status for field surveys and project team meetings.					\$50,000
							<b>Sub Total</b>	<b>\$50,000</b>
<b>Travel Outside Minnesota</b>								
							<b>Sub Total</b>	-
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
		Direct & Necessary	DNR's direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated projects. People Support (~\$26,235), Safety Support (~\$5,454), Financial Support (~\$23,209), Communication Support (~\$2,123), IT Support (~\$68,255), and Planning Support (~\$1,036).					\$126,313
							<b>Sub Total</b>	<b>\$126,313</b>
							<b>Grand Total</b>	<b>\$1,800,000</b>



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
<b>State</b>				
Cash	General Fund	A portion of MBS program management and supervision; office space; project operations support; classified project staff.	Pending	\$100,000
Cash	Heritage Enhancement	Classified staff project contributions, senior staff project leadership	Pending	\$300,000
Cash	Reinvest in Minnesota	Classified staff project contributions.	Pending	\$200,000
			<b>State Sub Total</b>	<b>\$600,000</b>
<b>Non-State</b>				
			<b>Non State Sub Total</b>	-
			<b>Funds Total</b>	<b>\$600,000</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [830837f2-0e8.pdf](#)

#### *Alternate Text for Visual Component*

A 1-page fact sheet briefly describing the project and graphically displaying the project's activities and outcomes....

### Optional Attachments

#### *Support Letter, Photos, Media, Other*

Title	File
Letter of Support from Superior National Forest	<a href="#">5a2be4c0-e53.pdf</a>
Letter of Support from Chippewa National Forest	<a href="#">2a0b8ab2-a80.pdf</a>

## 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?**

No

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

No

**Does your project include the design, construction, or renovation of a building, trail, campground, or other capital asset costing \$10,000 or more?**

No

**Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services, as defined in Minnesota Statutes section 299C.61 Subd.7?**

No

