

Final Abstract

Final Report Approved on April 13, 2026

M.L. 2021 Project Abstract

For the Period Ending June 30, 2025

Project Title: Minnesota Biological Survey: Setting A Future Course

Project Manager: Bruce Carlson

Affiliation: MN DNR - Ecological and Water Resources Division

Mailing Address: MN Department of Natural Resources - Division of Ecological & Water Resources 500 Lafayette Road

City/State/Zip: St. Paul, MN 55155

Phone: (651) 259-5083

E-mail: bruce.carlson@state.mn.us

Website: <https://www.dnr.state.mn.us/ewr/index.html>

Funding Source:

Fiscal Year:

Legal Citation: M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 03e and M.L. 2024, Chp. Sec. 2, Subd. 18

Appropriation Amount: \$1,500,000

Amount Spent: \$1,441,424

Amount Remaining: \$58,576

Sound bite of Project Outcomes and Results

The Minnesota Biological Survey: Setting a Future Course project wraps up the 35-year county-survey effort by completing data and specimen processing and a final report. It also provides new information on Minnesota's biodiversity by collecting and interpreting biological data and delivering results that support natural resource protection and management decisions.

Overall Project Outcome and Results

MBS with ENRTF support completed county-by-county baseline biological surveys for native and rare terrestrial plants and vertebrate animals, native plant communities, and ecologically intact landscapes between 1987-2022 (ML19-004A and previous). The Minnesota Biological Survey: Setting a Future Course project (ML2021-113) wraps up the county survey project by completing 1) data entry into the state's Natural Heritage Information System, 2) digitizing, georeferencing, and archiving of survey records, 3) preparation of biological specimens for accession to UMN Bell Museum collections, 4) map and data products for rare species, native plant communities, and sites of biodiversity significance, and 5) a final report of the methods and findings of the Minnesota County Biological Survey 1987-2022.

ML2021-113 looked to the future with targeted field surveys that addressed priority gaps in existing information and updates to biodiversity data from one-point-in-time observations made in the 1980s-90s. This included completion of baseline surveys in 140 sites including 19 sites for lichen species, 28 sites for insect pollinators (moths and butterflies), and 93 lakes for aquatic plant species. This work refines and greatly expands the information MBS can provide on the distribution and condition of these taxa in Minnesota. This work also discovered several species not previously documented in MN and a moths species new to science.

Results from this project and previous MBS ENRTF appropriations have broad use and applicability throughout the state. Recent applications of MBS data and information include identification and management of Scientific and Natural Areas; recommended updates to the Minnesota list of endangered, threatened and special concern species; development of pollinator best-management practices; site selection and seed mix development for cover crop, buffer and clean water initiatives; collection of biological specimens for use in the Minnesota Biodiversity Atlas; and technical support tools for sustainable forest management and calcareous fen groundwater management.

Project Results Use and Dissemination

Data from ML2021-113 and the 35-year MCBS are disseminated via DNR websites, GIS QuickLayers, Rare Species Guide, MN Conservation Explorer, MN GeoCommons, MN Biodiversity Atlas, non-public data DNR license agreements, and per request. Subject matter expertise about the work is provided to a variety of subjects and audiences including environmental review, habitat management, government, academia, and non-government organizations.

A final report summarizing the methods and primary results of the 35-year MN County Biological Survey project was completed and available on the MBS website. Lichen data from this project help establish the first conservation status ranks for 799 species in Minnesota.



Environment and Natural Resources Trust Fund

M.L. 2021 Approved Final Report

General Information

Date: April 13, 2026

ID Number: 2021-113

Staff Lead: Tom Dietrich

Project Title: Minnesota Biological Survey: Setting A Future Course

Project Budget: \$1,500,000

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

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

Project Reporting

Final Report Approved: April 13, 2026

Reporting Status: Project Completed

Date of Last Action: April 13, 2026

Project Completion: June 30, 2025

Legal Information

Legal Citation: M.L. 2021, First Special Session, Chp. 6, Art. 6, Sec. 2, Subd. 03e and M.L. 2024, Chp. Sec. 2, Subd. 18

Appropriation Language: \$1,500,000 the first year is from the trust fund to the commissioner of natural resources to complete the statewide baseline biological survey by finalizing data, analyses, and publications and by conducting targeted field surveys to fill missing gaps of information needed to support conservation of Minnesota's biodiversity. Any revenues generated through the publication of books or other resources created through this appropriation may be reinvested as described in the work plan approved by the Legislative-Citizen Commission on Minnesota Resources according to Minnesota Statutes, section 116P.10. and (a) The availability of the appropriations for the following projects

is extended to June 30, 2025: (13) Laws 2021, First Special Session chapter 6, article 6, section 2, subdivision 3, paragraph (e), Minnesota Biological Survey;

Appropriation End Date: June 30, 2025

Narrative

Project Summary: Provide information on Minnesota’s biodiversity by collecting and interpreting data and delivering results that support conservation actions by natural resource managers, decision-makers, and scientists.

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

The ongoing need to protect and manage functional ecological systems, with their component plant and animal communities, is accelerating with demands for clean water, energy, outdoor recreation, and natural resources. Data and analyses that help to conserve, manage, and restore the state’s biodiversity are necessary to address issues such as habitat loss and fragmentation, water contamination, loss of species and genetic diversity, and the spread of invasive species.

The Minnesota Biological Survey (MBS) collects, interprets, and delivers data on native plant and animal communities and functional landscapes to support conservation and management of biodiversity. These data and the information and products developed from them help public and private decision-makers and resource managers alike to evaluate options and prioritize actions to conserve, manage and restore Minnesota's natural heritage. Since 1987, MBS with ENRTF support has been working towards completion of county-by-county baseline biological surveys for native and rare terrestrial plants and vertebrate animals (ML19-004A and previous).

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.

MBS will achieve statewide completion of field work (i.e. data collection) for the county surveys by June 30, 2022 (see ML19-004A). The ML21 work plan proposed here wraps up and closes out the entire county survey project by bringing to final completion all 1) data entry into the state’s Natural Heritage Information System, 2) curation and permanent archiving of biological survey records, 3) preparation of biological specimens and accession to the Bell Museum of Natural History, 4) map products, and 5) analyses of MBS county survey findings for the period 1987-2022.

In addition, the ML21 work plan proposes to continue progress on (see ML19-004A and previous):

- statewide baseline surveys for invertebrate animals (insects, specifically pollinators) and aquatic plant communities. These are two subject areas that were not included at the start of the county biological survey in 1987 but launched at later dates in response to demand for this information; and
- targeted biological surveys in high priority locations to update biodiversity data from one-point-in-time observations made more than 20 years ago. This work is in response to ongoing and increasing demand for providing a current status of existing biodiversity data such that those data can more efficiently and

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?

Results from this project and previous MBS ENRTF appropriations have broad use and applicability throughout the state. Recent applications of MBS data and information include identification and management of Scientific and Natural Areas; updates to Minnesota’s list of endangered, threatened and special concern species; development of pollinator best-management practices; site selection and seed mix development for cover crop, buffer and clean water initiatives; collection of biological specimens for use in the Minnesota Biodiversity Atlas (ENRTF ML18 004-A); and technical support tools for groundwater management.

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

Activities and Milestones

Activity 1: County Biological Surveys 1987-2022: Final Data Synthesis and Delivery

Activity Budget: \$848,994

Activity Description:

MBS will bring to completion final data entry, interpretation, mapping, specimen preparation for recently finished county biological surveys in north-central Minnesota (ML19 MBS and previous). This will complete baseline biological surveys statewide and provide the complete set of documentation and records spanning the entire 35-year statewide survey, start to finish. MBS will complete the final synthesis, standardization (e.g. digitizing hard-copy records), and archiving of project records. MBS reports, website, social media, presentations, public exhibits, and online data and information delivery systems will also be updated with final statewide survey results that provide interpretations of status, significance, and future outlook of the state's biodiversity.

Activity Milestones:

Description	Approximate Completion Date
Final survey records and documents compiled and accessioned to DNR or other State archives.	June 30, 2024
Digital maps (GIS polygon data) finalized for native plant communities and MBS sites.	June 30, 2024
Final biological specimens prepared and accessioned to the Bell Museum and the UMN Entomology collections.	June 30, 2024
Final plant and animal survey data, field notes, photos entered into DNR databases.	June 30, 2024
Final statewide survey results and analyses delivered through standard MBS online platforms and hard-copy formats.	June 30, 2024

Activity 2: Conduct targeted surveys in high priority sites and habitats.

Activity Budget: \$651,006

Activity Description:

MBS will continue from the ML19 and previous MBS appropriations to update and expand county biological survey data that is >20 years old. Focus in this work plan will be placed in high priority sites in southwest, southeast, and east-central MN. MBS will continue progress on statewide baseline aquatic plant surveys, focusing this work plan on lakes in southern and east-central MN. ML19 and previous ENRTF appropriations to MBS have provided plant data for 2,020 lakes to-date and the discovery of species not previously documented in the state. MBS will continue progress on statewide baseline surveys for Lepidoptera (moths and butterflies), focusing this work plan on southwest, southeast, and east-central MN. ML19 and previous ENRTF appropriations to MBS focused Lepidoptera surveys in the far north and northwest part of the state and have resulted in the discovery of moth species new to science, documentation of species not previous recorded in the state, and significant improvements to our basic understanding of pollinator occurrence and distribution in the state.

Activity Milestones:

Description	Approximate Completion Date
1980s–90s era county surveys updated and enhanced in >20 sites in southern and east-central	June 30, 2024
Surveys for Lepidoptera (moths and butterflies) in ~50 sites in southern and east-central Minnesota.	June 30, 2024
Surveys for native and rare aquatic plants in ~75 lakes in southern and east-central Minnesota.	June 30, 2024
Data, specimens, field notes, photos from this Activity entered into DNR databases and UMN collections.	June 30, 2024

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Midwest Regional Endangered Species Coordinator	US Fish & Wildlife Service - Midwest Region Ecological Services	Listed species coordination and collaboration.	No
Ralph Holzenthal - Professor; Collections Manager	UMN Dpt. Of Entomology	Biological specimen curation.	No
George Weiblen - Professor and Science Director	UMN Bell Museum	Biological specimen curation and delivery of related project outcomes through the MN Biodiversity Atlas.	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines. MBS publishes and distributes project and program results in a variety of formats for various audiences.

MBS data are stored primarily in the DNR Natural Heritage Information System. Many GIS datasets, including MBS mapped native plant communities and MBS sites of biodiversity significance, are publicly delivered through MN Geospatial Commons (<https://gisdata.mn.gov/>) and within the DNR via the standard GIS data delivery system, QuickLayers. Data on state and federal-listed species are available through agreements with the requesting agency and the DNR, a data request form is available online: <http://www.dnr.state.mn.us/nhnrp/nhis.html>. MBS delivers data to national and international audiences through NatureServe (<https://www.natureserve.org/>) with much of these data accessible through their Explorer website (<https://explorer.natureserve.org/>). MBS often delivers data in response to requests from researchers at academic institutions, government agencies, and other organizations.

Many products are available on the DNR and MBS websites (www.dnr.state.mn.us/mbs/index.html) including MBS procedures, program and project updates, maps, reports, native plant community field guides, and references on biodiversity sampling techniques and methods. MBS web pages are updated with new information and have links to associated resources. MBS also communicates program and project highlights through the DNR and partner programs' Facebook pages.

Staff routinely make presentations that describe MBS methodologies and results to a wide range of audiences including county boards, local planning groups, citizen advisory groups, other biologists, land managers, and students. MBS staff provide local planners with ecological interpretations describing important native and rare species, ecological communities, and sites of biodiversity significance to assist with management plans.

Biological collections are deposited at Minnesota repositories, primarily at the University of Minnesota's J.F. Bell Museum of Natural History and at the UMN Entomology insect collection. As part of a larger network of museums and biological collections, these cooperators are essential to the documentation, permanent curation, and sharing of MBS

results. MBS biological specimens are publicly available to view digitally through the Bell Museum’s Biodiversity Atlas (<https://bellatlas.umn.edu/>). MBS and museum staff meet periodically to address curatorial, data management, and specimen and data sharing needs.

MBS has published several ecological books and field guides that are variously free to the public or sold through the MN Bookstore and the UMN Press. The DNR, Legislative, local, and academic libraries often have these products in their collections.

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.

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?

MBS 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, Federal State Wildlife Grants and project funding from ENRTF, Fish & Game Fund, and federal funds. DNR is developing strategies to sustainably fund MBS, recently completing a 10-year strategic plan for the program. 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.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Minnesota Biological Survey	M.L. 2015, Chp. 76, Sec. 2, Subd. 03c	\$2,450,000
Minnesota Biological Survey - Continuation	M.L. 2017, Chp. 96, Sec. 2, Subd. 03d	\$2,900,000
Minnesota Biological Survey	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03a	\$1,500,000

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount	\$ Amount Spent	\$ Amount Remaining
Personnel										
Project Manager		Project records and document management, volunteer coordination, landowner and partner coordination, project business management			25%	1.6		\$125,000	-	-
Natural Resource Specialist Int. - Entomologist		Pollinator field surveys, data and specimen preparation.			25%	1.6		\$85,000	-	-
Natural Resource Specialist SR - Plant Ecologist		Plant and vegetation data synthesis, analysis, mapping, and targeted field surveys.			25%	2.2		\$210,000	-	-
Natural Resource Specialist Int - Botanist/Plant Ecologist		Terrestrial and aquatic plant surveys, data and specimen processing, data synthesis, analysis, mapping.			25%	2.2		\$175,000	-	-
Information Officer 2		Digital and print media and information design, management, and dissemination.			25%	0.5		\$45,000	-	-
Natural Resources Specialist SR - Plant Ecologist		Plant and vegetation data synthesis, analysis, mapping, and targeted field surveys			25%	2	X	\$209,607	-	-
Natural Resources Specialist SR - Botanist/Plant Ecologist		Aquatic plant surveys, data and specimen processing, data synthesis, analysis, mapping.			25%	2	X	\$176,082	-	-
Research Scientist - Mammologist		Small mammal data synthesis and analysis, mapping, specimen processing, final reports			30%	0.8	X	\$108,000	-	-

							Sub Total	\$1,133,689	\$1,133,689	-
Contracts and Services										
MN.IT	Professional or Technical Service Contract	GIS, mapping, and spatial data/database design and technical expertise, delivery of data to public platforms, digital field data collection applications.				0.5		\$46,056	\$46,056	-
TBD External Vendors	Professional or Technical Service Contract	Contracts with biologists with advance field skills for surveys in support of Activity 2 Milestone 1.				1.5		\$168,375	\$113,094	\$55,281
UMN Bell Museum	Subaward	Contract with the Bell Museum Herbarium to speed the process of accessioning MBS specimens in support of Activity 1 Milestone 3.				0.2		\$17,713	\$17,713	-
Conservation Corp of MN & IA	Subaward	Addition of a CCMI Individual Placement position to support Activity 1.				0.5		\$25,000	\$21,705	\$3,295
							Sub Total	\$257,144	\$198,568	\$58,576
Equipment, Tools, and Supplies										
	Tools and Supplies	Field survey tools and supplies, specimen preparation supplies.	Tools and supplies for conducting field surveys and preparing biological specimens for accession to MN collections.					\$5,510	\$5,510	-
							Sub Total	\$5,510	\$5,510	-
Capital Equipment										
							Sub Total	-	-	-
Acquisitions and Stewardship										
							Sub Total	-	-	-

Travel In Minnesota										
	Miles/ Meals/ Lodging	Fleet, lodging, meal expenses while in travel status for field surveys.	Fleet, lodging, meal expenses while in travel status for field surveys.					\$16,334	\$16,334	-
							Sub Total	\$16,334	\$16,334	-
Travel Outside Minnesota										
							Sub Total	-	-	-
Printing and Publication										
							Sub Total	-	-	-
Other Expenses										
		Direct & Necessary	DNR's direct and necessary costs pay for activities that are directly related to and necessary for accomplishing appropriated projects. HR Support (\$21,594), Safety Support (\$4,011), Financial Support (\$15,717), Communication Support (\$1,324), IT Support (\$43,528), and Planning Support (\$1,149).					\$87,323	\$87,323	-
							Sub Total	\$87,323	\$87,323	-
							Grand Total	\$1,500,000	\$1,441,424	\$58,576

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Personnel - Natural Resources Specialist SR - Plant Ecologist		Plant and vegetation data synthesis, analysis, mapping, and targeted field surveys	Classified : The positions being classified were originally hired entirely to support this and previous ENRTF projects. However, the positions' longevity (>3 years) and now mix of funding no longer qualifies the positions for the State's LCCMR unclassified exemption. The positions' unique skills and expertise are required to successfully complete the ENRTF project. The positions' funding over the course of the grant will not change, there is not another source of funding to replace the ENRTF funding for this position at this time; thus, ENRTF funds will not be replacing or decreasing the amount of non ENRTF sources of funds spent on the position during the project period. When the project period ends, the positions' ENRTF funding will end, and the ENRTF approved complement of the agency reduced accordingly.
Personnel - Natural Resources Specialist SR - Botanist/Plant Ecologist		Aquatic plant surveys, data and specimen processing, data synthesis, analysis, mapping.	Classified : The positions being classified were originally hired entirely to support this and previous ENRTF projects. However, the positions' longevity (>3 years) and now mix of funding no longer qualifies the positions for the State's LCCMR unclassified exemption. The positions' unique skills and expertise are required to successfully complete the ENRTF project. The positions' funding over the course of the grant will not change, there is not another source of funding to replace the ENRTF funding for this position at this time; thus, ENRTF funds will not be replacing or decreasing the amount of non ENRTF sources of funds spent on the position during the project period. When the project period ends, the positions' ENRTF funding will end, and the ENRTF approved complement of the agency reduced accordingly.
Personnel - Research Scientist - Mammologist		Small mammal data synthesis and analysis, mapping, specimen processing, final reports	Classified : The work this classified position normally does will be directed to an assistant mammologist on staff. This research scientist will be removed from their normal duties and placed on a special project focused on Activity 1 of this work plan as related to small mammal data, specimens, and reports produced from the county surveys. This person's unique experience and expertise are required to complete this ENRTF project. When the project period ends, the position's ENRTF funding will end, and the ENRTF approved complement of the agency reduced accordingly.

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount	\$ Amount Spent	\$ Amount Remaining
State						
Cash	Heritage Enhancement	Senior ecologists and zoologists who lead and provide oversight to field survey efforts and associated analysis. Associated operations budget.	Secured	\$375,000	\$375,000	-
Cash	General Fund	A portion of MBS program management and supervision; office space; program operations.	Secured	\$250,000	\$250,000	-
			State Sub Total	\$625,000	\$625,000	-
Non-State						
Cash	State Wildlife Grant (Federal)	Animal surveys and monitoring, data management, outreach, technical guidance	Secured	\$225,000	\$225,000	-
			Non State Sub Total	\$225,000	\$225,000	-
			Funds Total	\$850,000	\$850,000	-

Attachments

Required Attachments

Visual Component

File: [2a02ffaf-79c.pdf](#)

Alternate Text for Visual Component

A 1-page fact sheet showing Activity 1 with a series of MN maps showing the 35-year progress and final completion of statewide county biological surveys and a map of Activity 2 showing locations of the field survey milestones....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Background Check Certification Form	37722d18-659.pdf

Media Links

Title	Link
MN Conservation Explorer	https://mce.dnr.state.mn.us/
MN Biological Survey website	https://www.dnr.state.mn.us/eco/mbs/index.html
MCBS Final Report 1987-2022 v1.0	https://files.dnr.state.mn.us/eco/mcbs/mcbs-statewide-report-1987-2022-version1.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

We proposed \$3.2 million and were recommended for \$1.5 million. All of Activity 2 in the \$3.2m proposal was removed and the budget reduced accordingly. We feel that the milestones in the \$3.2m proposal's Activity 2 can stand alone as future proposals. The draft \$1.5m work plan has 2 Activities that are largely the same as the \$3.2m proposal but reductions in personnel, equipment/supplies, and travel were necessary to arrive at a \$1.5 million budget. In addition, the \$3.2m proposal's Activity 1 had a milestone for a statewide report and 9 regional reports on the statewide survey but with reduced budget and personnel we have reduced that deliverable in Activity 1 of the draft \$1.5m work plan.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the Commissioner's Plan applies.

Does your project have potential for royalties, copyrights, patents, sale of products and assets, or revenue generation?

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

Work Plan Amendments

Amendment ID	Request Type	Changes made on the following pages	Explanation & justification for Amendment Request (word limit 75)	Date Submitted	Approved	Date of LCCMR Action
1	Amendment Request	<ul style="list-style-type: none"> Budget - Personnel 	Amendment is requested to change 2.0 FTE personnel from unclassified to classified. The positions being classified were originally hired unclassified to entirely to support this and previous ENRTF projects. However, the positions' longevity (>3 years) and now mix of funding no longer qualifies the positions for the State's LCCMR unclassified exemption. The positions' unique skills and expertise are required to successfully complete the ENRTF project.	June 30, 2023	Yes	July 5, 2023
2	Amendment Request	<ul style="list-style-type: none"> Budget - Personnel Budget - Professional / Technical Contracts 	An amendment is requested to reduce Personnel by \$98,810.00 and move those funds to two new contract categories: 1) one to support Activity 2 Milestone 1, enhanced 1980s-90s era surveys (\$93,860.00) and 2) to support Activity 1 Milestone 3, speed accessioning of plant specimens collected for the county biological surveys (\$4,950.00). We do not anticipate either can be completed under current MBS staff capacity.	December 19, 2023	Yes	December 21, 2023
3	Completion Date	<p>Previous Completion Date: 06/30/2024 New Completion Date: 06/30/2025; Governor Approved on 04/15/2024</p>	This appropriation is a continuation from previous overlapping MN Biological Survey appropriations. Previous awards were delayed and extended due to COVID that resulted in spending on this appropriation not beginning until the second year. This combined with hiring freezes and restrictions further slowed project progress. Additionally, we have been able to contribute more department funds to the project than expected due to	November 8, 2023	Yes	May 21, 2024

			unplanned biennium-end dollars becoming available late in the fiscal year.			
4	Amendment Request	<ul style="list-style-type: none"> • Budget • Other • Budget - Personnel • Budget - Professional / Technical Contracts • Budget - Capital, Equipment, Tools, and Supplies • Budget - Travel and Conferences • Budget - Non-ENRTF Funds Contributed 	Amendment requested to add a Mammologist classified position to Personnel to work on Activity 1 milestones for small mammals and to reduce Personnel by \$24K and redirect to 1) \$10K to Contracts with Biologists to continue work to the end of the new grant completion date and to add a small contract with advanced skills needed for this work and 2) \$14,000 to Contract with Bell Museum to speed plant specimen accessioning.	July 19, 2024	Yes	August 5, 2024
5	Amendment Request	<ul style="list-style-type: none"> • Budget - Personnel • Budget - Professional / Technical Contracts • Budget - Capital, Equipment, Tools, and Supplies • Budget - Travel and Conferences 	Amendment requested to decrease Personnel by \$3,718, MNIT Contract by \$63,944, Bell Museum Subward by \$1,237, and Travel by \$22,733; increase Contracts with biologists by \$66,122 and Supplies by \$510; and add \$25K for a Subaward to CCMI. MN.IT, Travel, Personnel, and UMN subaward are coming in underbudget allowing for additional attention to Activity 2 lichen surveys and Activity 1 Rare Species Guide profile writing and records management.	January 31, 2025	Yes	February 3, 2025
6	Amendment Request	<ul style="list-style-type: none"> • Budget • Budget - Personnel • Budget - Professional / Technical Contracts • Attachments 	Amendment requested for a final budget adjustment. The budget adjustment will increase salary by \$1,607. Those funds will be removed from Contracts with Biologists, which was underspent by approximately \$60,000.	January 30, 2026	Yes	March 12, 2026

Status Update Reporting

Final Status Update August 14, 2025

Date Submitted: February 19, 2026

Date Approved: March 12, 2026

Overall Update

Final processing of data and results of the 35-year MN County Biological Survey from this and previous appropriations have been completed. Work to digitize hard-copy MCBS documents achieved 90% completion while a final MCBS report was completed and available on the MBS website.

Activity 1 is complete including 415 Bryophyte (moss) and over 2,300 mammal specimens prepared this reporting period for accession to the Bell Museum collections. The sub award to the Bell Museum to mount and digitize 2,000 plant specimens is complete. Mapping Sites of Biodiversity Significance was completed for 87 counties while native plant community (NPC) mapping was completed for 86 counties with Itasca County in course for completion in 2026.

Activity 2 is complete with 140 surveys of the roughly 145 originally expected to be accomplished for aquatic plants and Lepidoptera and to update and enhance 1980s–90s era MCBS surveys with lichen surveys.

Contracts with biologists were underspent by \$60,183, mostly due to fewer lichen surveys completed than planned. An amendment is requested for a final budget adjustment, moving \$1,607 from contracts to personnel.

Activity 1

Survey records for 87 counties from the 35-year survey were compiled and stored in DNR archives including data sheets, field notebooks, photos, and maps; during this reporting period work was completed on a dozen counties, 75 field notebooks, and nearly 200 large format maps. Efforts to digitize all hard-copy records is 90% complete and will be completed in 2026 after this appropriation ends with non-ENRTF funds. Digital maps for MBS Sites of Biodiversity Significance were completed for 87 counties while native plant community mapping in High and Outstanding-ranked Sites was completed for 86 counties and is in the final stages of completion for the last county, Itasca, that will be completed in 2026 after this appropriation ends with non-ENRTF funds. The remaining plant and animal specimens from the survey were prepared and submitted to UMN Bell Museum with over 3,500 specimens submitted during this reporting period including 1,000+ plant, 336 Bryophyte (moss), and 2,300 mammal specimens. DNR databases were populated and are up to date with rare species observation records and vegetation plot data from the survey. A final report was completed and available on the MBS website providing survey methods and findings of the 35-year survey. *(This activity marked as complete as of this status update)*

Activity 2

Data entry, management and specimen processing was completed for lichen survey data collected in 2024 on this appropriation. An additional 10 survey targets were identified for 2025, but unexpected contractor limitations resulted in only two surveys completed by the end of this appropriation. Overall, the 19 sites surveyed for lichens to enhance 1980s–90s era county surveys were very successful for the new-to-science data and information gained about these species in Minnesota and the conservation value of the sites and habitats in which the lichen species occur. In total, 140 sites were surveyed on this appropriation, 19 sites for lichen species to enhance 1980s–90s era county surveys, 28 sites for lepidopteran species and 93 lakes for aquatic plant species. Note that Lepidopteran surveys were considered complete for this appropriation in previous update reports. We called them completed for this appropriation because we sought and received a new ENRTF grant for Lepidoptera surveys (2024 03i). We moved our one Lepidopterist on staff to the new grant as we were not successful in our efforts to add capacity by hiring a temporary lepidopterist position. The amendment approved with the Feb. 1 2025 update was influenced by this change in Lepidoptera surveys.

(This activity marked as complete as of this status update)

Dissemination

Data from the 35-year survey are disseminated via DNR/MBS websites, GIS QuickLayers, Rare Species Guide, MN Conservation Explorer, MN GeoCommons, non-public data DNR license agreements, and per request. Subject matter expertise developed from the survey is provided to a variety of subjects including environmental review and sustainable forest management and audiences including government, academia, and non-government organizations.

A final report summarizing the methods and primary results of the 35-year MN County Biological Survey project was completed and available on the MBS website.

Lichen data produced under this and previous appropriations were disseminated to subject matter experts to establish the conservation status for 799 lichen species in Minnesota. That effort resulted in 151 species identified as rare and/or vulnerable to decline.

Improvements to the delivery of native plant community survey results were completed through the creation of an online data collection application for vegetation plots (relevés).

ENRTF is acknowledged in these efforts through placement of the logo and/or attribution language on published and presented materials, recognition of ENRTF in metadata (for digital data products) and social media posts, and verbal acknowledgement in presentations.

Status Update Reporting

Status Update February 1, 2025

Date Submitted: January 31, 2025

Date Approved: February 3, 2025

Overall Update

This update reports progress through December 31, 2024. Significant progress continues in this appropriation to wrap up the 35-year MN County Biological Survey project.

Work continues to process biological specimens with particular attention to Bryophyte (moss) and fluid-preserved mammal specimens readied for final accessioning to the Bell Museum. Work continues to organize and digitize MCBS hard-copy survey data and records with another 11 counties completed. Mapping of native plant communities continued in four counties involving over 482,000 acres in 13 MBS sites. Work continues on the MCBS Final Report with parts variously under editorial review and first-drafting.

Lichen surveys were completed in 17 SE MN sites that resulted in the discovery of at least 14 new State records and over 200 specimens collected for accession to the Bell Museum.

As this appropriation nears completion, work tasks are being redistributed to support the greatest needs. Amendment requested to decrease Personnel, MNIT Contract, Bell Museum Subward, and Travel; increase Contracts with biologists, Supplies; an add a Subaward to CCMI. MN.IT, Travel, Personnel, and UMN Subaward are coming in underbudget allowing for additional attention to Activity 2 lichen surveys and Activity 1 Rare Species Guide profile writing and records management.

Activity 1

There was an increased focus on biological specimens this reporting period. Work progressed on fluid-preserved mammal specimens. They were examined to verify identification, confirm the associated NHIS records were accurate, and transferred to final storage jars for accessioning to the Bell Museum. A total of 79 Bryophyte (moss) specimens, a particularly hard to identify taxonomic group, were identified and readied for accessioning to the Bell.

Work continues to organize, georeference, and stage for digitizing MCBS hard-copy survey data, field notes and accompanying documents. Another 11 counties' documents are now fully complete. Progress was made on 28 field notebooks, 124 large format maps, and site summary logs were completed for 22 counties. An amendment is requested to allow for additional capacity toward these milestones.

Desktop GIS mapping of native plant communities (NPC) continued with progress made across four counties. Thirteen sites were completed with draft mapping, totally slightly over 100,000 acres. Final quality control and certification was completed on an additional 382,000 acres.

Work continues on the MCBS Final Report. Complete drafts of the Introduction and Approach sections are under review by the editor. The Results section is being drafted that includes focus on data visualizations, figures, and maps.

Activity 2

This activity was previously marked complete in error. The Lepidopteran and aquatic plant surveys are complete. The lichen survey work is ongoing.

In total, 17 sites within The Blufflands were surveyed for lichen species as enhancements to 1980-90's era surveys.

Surveys targeted Cliff-Talus and Upland Prairie native plant communities focused on rock faces, cliffs and rocky tops of bluff prairies. Surveys discovered, at minimum, 14 new species to Minnesota (additional state records possible pending final verifications). Eleven species found were recorded for the first time in the Blufflands. New populations were discovered for two state-listed species; 5 new occurrences of *Dermatocarpon mouliinsii* and one of *Usnea rubicunda*. In addition, 63 new occurrences were discovered across 16 rare and Watchlist species. This work resulted in over 200 voucher specimens that will be accessioned at the Bell Museum Herbarium.

Because of the great success of this work, we are requesting an amendment to increase funds toward continued lichen surveys in east-central Minnesota. Lichen surveys can still be conducted in early spring 2025, prior to the expiration of this appropriation. Increased funds would also support dissemination of this new information for a relatively unknown, under-surveyed taxon via the DNR online Rare Species Guide.

Dissemination

Data and information are disseminated via standard formats such as the DNR/MBS website, GIS QuickLayers, Rare Species Guide, MN Conservation Explorer, and MN GeoCommons. An additional 37 Rare Species Guide profiles for rare plant species were written and are currently in review.

In this reporting period, MBS staff provided technical guidance to multiple entities related to this appropriation including:

- providing expertise to a project developing evaluation criteria for prioritizing peatland protection projects,
- providing guidance on the risks of inbreeding and outbreeding depression in native Hemlock,
- continued engagement in reviewing Minnesota systems within a nationwide mapping product developed by NatureServe,
- advising on a management planning for the Magney-Snively Natural Area, and
- provided ecological expertise on peatlands and morainal landscape to MN Association of Professional Soil Scientist at Marcell Experimental Forest.

MBS staff participated as subject matter experts in several training events this reporting period:

- a Tribal Wetland Working Group Wetland Plant ID workshop,
- a Minnesota Grasses Workshop,
- a Minnesota Ferns and Lycophytes Workshop, and
- an informal field tour with Federal partners advising on how the Minnesota's Native Plant Community Classification integrates with the Federal Ecological Sites framework.

Status Update Reporting

Status Update August 1, 2024

Date Submitted: July 19, 2024

Date Approved: August 5, 2024

Overall Update

Statewide completion of native plant community mapping, sites of biodiversity significance final determinations, and final site descriptions is in-progress in the last six counties. Processing plant specimens has accelerated thanks to three new volunteers and a subaward to the Bell Museum Herbarium for mounting and digitization.

A final report is underway that will summarize the development, rationale, methods, results, and accomplishments of the Minnesota County Biological Survey (MCBS) 1987-2022. The report will contain four sections: Introduction, Approach, Results, and Products.

Field work for aquatic plant and Lepidopteran surveys are complete. Aquatic plants were surveyed at 93 lakes, one river and one floodplain, delivering well over the expected 75 sites. Lepidopteran surveys were completed at 28 sites.

An amendment is requested to add a classified mammologist that involves offloading work to an unclassified assistant position who is on grant funding that will end allowing them to take on the work. Placing the classified mammologist on this appropriation is urgently needed to finish the MCBS mammal parts of Activity1 on time as they are the only mammologist who can do this work. Availability of the assistant to take on the classified work and the available budget provides the opportunity to do this.

Activity 1

Desktop GIS mapping of native plant communities (NPC) continued with most progress made in Koochiching County. Approximately 175,000 acres were mapped. Another 460,000 acres of NPC mapping were certified for distribution. The final mapping in Wadena County was completed.

Final quality control checks of MBS sites and NPC mapping are in-progress. Twenty sites were completed in Koochiching County and 99 were completed in Cass County. 60 site descriptions were completed for sites in Cass County.

Approximately 1,000 plant specimens were mounted and digitized via a sub award to the Bell Museum Herbarium. Volunteers processed and accessioned backlogged plant specimens for five counties. Another five counties are underway.

Work continues to organize, georeference, and stage for digitizing MCBS hard-copy survey data, field notes and accompanying documents. Progress was made on 19 field notebooks, 22 large format maps, site summary logs for 15 counties, and document scanning for 9 counties.

The outline for the MCBS Final Report was approved. The Introduction and Approach are drafted and under review. Data summaries for the Results section are currently being created.

Activity 2

Final survey plans were completed by contractors, approved by MBS staff, and field work for enhanced surveys began. Survey highlights thus far include the discovery of seven new State record lichen species, new populations of *Dermatocarpon moulinsii* (endangered), *Usnea rubicunda* (threatened) and six other rare lichen species. Numerous species, rare and common, were not previously known from the Blufflands, representing a substantial improvement in

our understanding of their occurrence and distribution in the state.

Lepidopteran surveys were conducted using both nocturnal and diurnal methods at six new sites. This work resulted in approximately 150 specimens, including numerous new county records and the second Minnesota record of *Psaphida styracis*. Twenty-eight surveys have been completed on this appropriation to date. Considerable time was spent processing over 2300 specimens (representing almost 800 species) from the 2023 field season.

Data processing from the 2023 field season continued. Quality control checks for 2023 aquatic plant surveys are complete and approximately 300 specimens were submitted for accessioning. Aquatic plant survey species lists per lake were generated and edited, with 128 finalized for dissemination. Field planning 2024 was completed. An additional 13 lake surveys were completed, bringing the total for this appropriation to 93 lakes.

(This activity marked as complete as of this status update)

Dissemination

Data and information from this and previous MBS appropriations are disseminated via standard formats such as the DNR/MBS website, GIS QuickLayers, Rare Species Guide, MN Conservation Explorer, and MN GeoCommons.

In this reporting period, MBS staff provided technical guidance to multiple entities related to this appropriation including topics about State-listed species, peatland land protection opportunities, and rare plant seed banking. NPC data and subject matter expertise produced by this project was delivered to a peer review of a nationwide mapping product developed by NatureServe. Technical guidance was provided to the Isanti Soil and Watershed Conservation District regarding rare aquatic plant species protection along with detailed information from survey efforts in five basins within the District.

A comprehensive Ecological Evaluation of the Polemonium Bog Site of Biodiversity Significance in St. Louis County was completed.

MBS conducted an annual event in which staff presented highlights from their most recent field work. This year's event was held virtually across four days and attracted over 450 attendees from MN and across the nation. This appropriation supported two presentations focused on aquatic plant surveys and lepidopteran surveys. A presentation summarizing results from the full County Survey for aquatic plant species

Status Update Reporting

Status Update February 1, 2024

Date Submitted: February 22, 2024

Date Approved: February 26, 2024

Overall Update

This update reports on progress through December 31, 2023. Progress was made on most Milestones of Activity 1, including continued work on native plant community (NPC) mapping, compiling and digitizing project documents and records, biological specimen processing, and work was initiated to develop final statewide survey products. Internal capacity for NPC mapping was reduced with the unexpected resignation of a staff member. Alternative ways to increase capacity, such as contracting out NPC mapping, are currently being explored.

Progress was also made for all Milestones of Activity 2, including continued field surveys for lepidoptera and aquatic plants, with their associated specimen processing, and work was initiated to conduct updated or enhanced surveys via contract.

Several new collaborations within MBS's aquatic plant surveys were initiated. Aquatic plant surveys were paired with targeted bee surveys and successfully located two specialist bee species. And, preliminary discussions into developing Species Distribution Models for aquatic plant species have begun in collaboration with another ENRTF funded project to MBS (2022-048).

Four new State record species were discovered during this reporting period, three Lepidopterans and one non-vascular aquatic plant.

Approximately 25% of the project would remain incomplete if the extension request is not granted.

Activity 1

Desktop GIS mapping of native plant communities (NPC) continued with the most progress made in St. Louis and Koochiching Counties. Mapping in 10 MBS sites was completed, totaling just over 150,000 acres. Another almost 70,000 acres of mapping is complete within MBS sites still in progress.

Final quality control checks of MBS sites and NPC mapping are in-progress. For example, final checks identified several natural areas not originally included, which led to the addition of several small new High and Outstanding Sites and the expansion of a few existing Sites. A GIS script for tracking mapping progress statewide was finalized that provides quick mapping status summaries. Two new GIS tools are being developed to streamline the final data entry for Site Descriptions and making edits to Sites.

A working group was formed to develop final statewide survey products. An outline for a final report was created, put out of review, and revised. Content creation for elements that do not require final data processing are in-progress.

Progress continues with dedicated volunteers to organize, georeference, and stage for digitizing MBS hard-copy survey data, field notes and accompanying documents from county surveys 1987-2022.

Activity 2

Surveys for rare lichen species in four south-eastern counties was completed by contractors. This work will enhance previous plant surveys by targeting data gaps in bedrock and cliff habitats where lichens dominate. This work is also

important to improving understanding of poorly understood State-listed lichen species.

Aquatic plant surveys were conducted on 24 lakes across 11 counties. This work resulted in six new rare species occurrences, 16 new county records, 190 collected specimens and one new State record, Chara hydrophytes. The total surveys completed on this appropriation to date are 80 lakes, one river and one floodplain. Data processing for this work is in progress.

Lepidopteran surveys were conducted using both nocturnal and diurnal methods at 11 new sites this reporting period. Work focused the Inner Coteau and Minnesota River Prairie subsections. This work resulted in approximately 900 specimens, including three new State records. The total surveys completed on this appropriation to date is 22. Considerable time was spent processing over 1,000 newly or previously collected specimens.

Dissemination

Data and information from this and previous MBS appropriations are disseminated via standard formats such as the DNR/MBS website, GIS QuickLayers, Rare Species Guide, MN Conservation Explorer, and MN GeoCommons.

MBS staff participated as subject matter experts in several events this reporting period. This work was represented at a booth at the Native Plant Society Annual meeting. MBS contributed expertise at two ecological public field events in the Northeast, one for the Arrowhead Native Plant Explorers and one for the MN Point Great Lakes Regional Challenge event. MBS contributed to a two-day aquatic plant identification workshop hosted by DNR's Lake Ecology Unit.

MBS staff provide technical guidance to multiple entities about State-listed species, dune ecology, and human use and development for MN Point in Duluth – an Outstanding Site of Biodiversity Significance. MBS provided technical guidance to St. Louis County related to the Polemonium Bog, a potential wetland preservation bank at the site.

The MBS Aquatic Botanist reported current finds as requested to several Counties, internal DNR partners (e.g. DNR's Watercraft Inspection program) and water management organizations. They also assisted various entities including, Counties, contractors, and private landowners, with species identification and proper aquatic plant specimen collection techniques.

Status Update Reporting

Status Update August 1, 2023

Date Submitted: August 1, 2023

Date Approved: September 26, 2023

Overall Update

This update reports on progress through June 30th, 2023. This ML21 appropriation is a continuation of the now completed ML19 appropriation. Significant progress continues on the project in areas of native plant community mapping, compiling and digitizing project documents and records, field surveys for lepidoptera, and biological specimen processing associated with this and previous appropriations.

Some Milestones await starting until others are first completed. For example, Activity 1, Milestones 1, 2, 3, and 4 all need to be completed before Activity 1 Milestone 5 make much progress. We have also put greater emphasis in the first years of this grant on Activity 1 and have had to pause most progress on Activity 2, Milestone 1. This, in part, due to staffing limitations and a continued knock-off effect on this grant from the delays invoked by the COVID pandemic on the ML17 and ML19 MBS appropriations.

Contributions from Other Funds to this project went up significantly with an unplanned biennium-end lump sum increase in State Funds. This contributes to lower-than-expected direct spending on the grant during the reporting period.

For these reasons, we anticipate requesting a one-year, no cost extension for this grant as part of the ML24 LCCMR/ENRTF bill.

Activity 1

Desktop GIS mapping of native plant communities (NPC) continued in numerous locations statewide. 395,458 acres were mapped and classified to NPC during this reporting period. This includes completing MBS NPC mapping in Cass County and substantial progress in Koochiching and Clearwater counties. Additionally, initial GIS NPC polygon delineation (i.e. mapped but not classified) is now complete for all MBS Sites of High and Outstanding Biodiversity Significance in all MN counties.

Plant specimen preparation and accessioning from counties surveyed under ML19 is ongoing and nearing completion as we wait to hear on final species determinations from experts. Notable progress includes taxa-expert annotation for 20 challenging Botrychium and Poa specimens, and the addition one more project scientist for whom all specimen work for the ML19 and previous appropriations is complete.

Progress continues to organize, georeference, and stage for digitizing MBS survey data, field notes and accompanying documents originating from MBS county surveys spanning the past 30+ years. Much of this work to-date (continued from ML19 MBS appropriation) has focused on southern and western MN counties and staff who are nearing retirement or recently retired.

Volunteers under the direction of grant-funded project scientists contributed substantially to the accomplishments under this Activity.

Activity 2

Lepidopteran specimens (mostly moths) from 2022 were processed and staged for accession to collections. Highlights

include:

- 163 species from Forestville/Mystery Cave State Park, Fillmore Co.
- 174 species from private bluff prairie in Fillmore Co.
- 127 species from Cedar Rock SNA, Redwood Co.
- 141 species from River Warren Outcrops SNA, Renville Co.
- 164 species from Blue Mounds State Park, Rock, Co.
- 145 species from Hole-in-the-Mountain Prairie, Lincoln Co., including the oddball, *Meroptera mirandella*.
- 7 potential new state records of moth.

Preparation for 2023 field surveys was completed and floristic surveys were completed for 16 lakes and one river in McLeod, Sherburne, Steele, and Waseca counties. Discoveries included 6 new county records in Sherburne and Steele, 10 in McLeod, and 4 in Waseca.

Aquatic plant specimen preparation, annotation, and accession to UMN collections continued from surveys conducted summer 2022. This involved 74 aquatic plant specimens including 44 rare species. Lake plant survey data from 2022 was used to generate new aquatic plant lists for 53 lakes. Aquatic plant data were compiled and harvested from iNaturalist and other sources for State-Listed aquatic plant species *Sagittaria montevidensis* ssp. *calycina*, *Potamogeton bicupulatus*, and *Decodon verticillatus* to refine 2023 survey methods for these species.

Dissemination

MBS native plant community data and information were delivered for use by Superior National Forest Ecologists in a revision to the Ecological Classification System at the Section, Subsection and Land Type Association levels; by the DNR Wetland Monitoring Program to choose long-term monitoring locations; and by researchers needing native vegetation reference-site data for comparison in a study of peatland restoration.

MBS compiled and provided over 100 aquatic taxa lists to the New York Botanical Garden: Searchable Databases/Collections.

MBS GIS datasets downloaded or added to a view for FY23 are summarized below:

DNR QuickLayers (# Layer Adds for FY23):

NHIS Rare Features Data - Nonpublic (996)

DNR Native Plant Communities (358)

NHIS - Observation Database Standardized (303)

NH Screen Package (198)

MBS Sites of Biodiversity Significance (197)

DNR Relevé Sites (167)

NHIS - Observation Database Simplified (99)

DNR Native Plant Communities - NPCs by G-ranks (72)

DNR Native Plant Communities and Land Cover - EWR (39)

MBS Ecological Evaluations (37)

MBS Lakes and Aquatic Plant Data (37)

MN Geospatial Commons (# Resource Page Views for FY23):

DNR Native Plant Communities (1554)

MBS Sites of Biodiversity Significance (867)

DNR Native Prairies (447)

MBS Lakes and Aquatic Plant Data (129)

MBS Railroad Rights-of-Way Prairies

Status Update Reporting

Status Update February 1, 2023

Date Submitted: February 1, 2023

Date Approved: February 13, 2023

Overall Update

This update reports on progress made through December 31, 2022. This ML21 appropriation is a continuation of ML19 and previous ENRTF appropriations. The ML19 appropriation is currently in its last year as a result of a one-year extension due to COVID-19 related limitations. See both ML19 and this ML21 update report for the complete accounting of accomplishments on this body of work. Additional staff and support were brought on board during this reporting period to provide additional capacity specifically aimed at completing milestones two and four of Activity 1. Significant progress continued towards final data synthesis and delivery of this 35-year project with particular accomplishments in mapping native plant communities and digitizing and archiving paper field records and GIS mapping of native plant communities in MBS Sites of Biodiversity Significance. Field survey accomplishments during the reporting period related to Activity 2 were supported by both ML19 and ML21.

Activity 1

A GIS database and associated shapefiles were developed to archive and deliver (via DNR QuickLayers and MN GeoSpatial Commons) the locations of all MBS Ecological Evaluation reports that were a result of work accomplished on this and the previous ENRTF appropriations for this 35-year project.

Desktop GIS mapping of native plant communities continued in numerous locations statewide with approx. 145,000 acres delineated and classified and over 33,000 acres certified during this reporting period. Volunteers substantially contribute to these accomplishments.

Plant specimen preparation and accessioning from counties surveyed under ML19 is near complete.

Progress continues to organize, georeference, and stage for digitizing MBS survey data, field notes and accompanying documents originating from MBS county surveys spanning the past 30+ years. Most the accomplishments for this project are achieved with volunteers.

Work on MBS's Rare Species Guide continued. Draft reports for most of Minnesota's Threatened and Endangered species are complete. MBS Sites of Biodiversity Significance were used in the creation of a Lake Superior Binational Important Habitat Map to aid in setting priorities for protection and restoration in the Lake Superior watershed. MBS staff provided technical guidance to a wide range of audiences related to outcomes of this project.

Activity 2

Lepidoptera field surveys occurred in 11 sites across the Eastern Broadleaf Forest Province. As of this reporting period, 393 species have been recorded and 809 specimens processed from this work.

Native and rare aquatic lake plant surveys occurred in 40 lakes across four counties. These surveys discovered 27 species not previously known from a county and six new populations of rare species. Targeted searches for *Sagittaria calycina* in the Cannon River Floodplain were also conducted.

Insect and aquatic plant specimen preparation, annotation by experts, and accessioning to UMN collections was accomplished. Notably, 77 aquatic macroalgae specimen identifications were annotated by experts from the New York

Botanical Garden. Work continued to create and deliver new plant lists for lakes that MBS surveyed under this and previous appropriations for this project.

Dissemination

MBS delivered a wide range of data, interpretations, analysis, and reports during this reporting period to partners and related to conservation and land management plans. MBS also publishes and distributes data in various standardized repositories. Examples include: MN Geospatial Commons, MN Conservation Explorer, the DNR and Legislative libraries, staff technical guidance and presentations, physical specimens collections (such as the Bell Museum of Natural History), and through NatureServe (an international organization that shares data worldwide). For the most up to date information and links to resources see <http://www.dnr.state.mn.us/mbs/index.html>.

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.

MBS conducted an annual fall event in which staff presented highlights from their most recent field work. This year's event was held virtually across four days and attracted over 350 attendees. This appropriation supported three presentations focused on aquatic surveys, lepidopteran surveys, and the Minnesota Conservation Explorer. This appropriation also supported MBS participation in two technical workshops: aquatic plant identification and forest grasses identification.

Status Update Reporting

Status Update August 1, 2022

Date Submitted: September 6, 2022

Date Approved: September 6, 2022

Overall Update

No activity occurred on this project between July 1, 2021 and June 30th, 2022. Work on this project started July 1, 2022. Accomplishments and budget updates dating to July 1, 2022 will be provided in the February 1, 2023 status update report. This ML21 appropriation is a continuation of ML19 and previous ENRTF appropriations. ML19 and ML21 appropriations overlap with ML19 in its third year and ML21 in its first year. We intend to spend ML19 first and then start on ML21 after ML19 is finished. ML19 is finishing a little later than planned due to COVID limitations over the past two years. ML21 Activities and Milestones remain the same with full intentions to deliver as scheduled at this time.

Activity 1

No activity occurred on this project between July 1, 2021 and June 30th, 2022. Work on this project started July 1, 2022. Accomplishments and budget updates dating to July 1, 2022 will be provided in the February 1, 2023 status update report. See overall update for more information.

Activity 2

No activity occurred on this project between July 1, 2021 and June 30th, 2022. Work on this project started July 1, 2022. Accomplishments and budget updates dating to July 1, 2022 will be provided in the February 1, 2023 status update report. See overall update for more information.

Dissemination

No activity occurred on this project between July 1, 2021 and June 30th, 2022. Work on this project started July 1, 2022. Accomplishments and budget updates dating to July 1, 2022 will be provided in the February 1, 2023 status update report. See overall update for more information.