



# Environment and Natural Resources Trust Fund

M.L. 2024 Approved Work Plan

## General Information

**ID Number:** 2024-072

**Staff Lead:** Tiffany Schaufler

**Date this document submitted to LCCMR:** June 6, 2024

**Project Title:** Foundational Data for Moth and Butterfly Conservation

**Project Budget:** \$195,000

## Project Manager Information

**Name:** Gerda Nordquist

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

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## Project Reporting

**Date Work Plan Approved by LCCMR:** June 20, 2024

**Reporting Schedule:** June 1 / December 1 of each year.

**Project Completion:** June 30, 2027

**Final Report Due Date:** August 14, 2027

## Legal Information

**Legal Citation:** M.L. 2024, Chp. 83, Sec. 2, Subd. 03i

**Appropriation Language:** \$195,000 the second year is from the trust fund to the commissioner of natural resources to perform field surveys and consolidate existing data to create the first comprehensive list of Minnesota moths and butterflies. This appropriation is also to conduct outreach to inform land managers and to facilitate public appreciation of these species.

**Appropriation End Date:** June 30, 2027

## Narrative

**Project Summary:** This project will build the first comprehensive list of Minnesota moths and butterflies. Information gained through surveys and outreach efforts will inform land managers and inspire public appreciation.

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

Minnesotans are concerned about declining biodiversity in our state, especially pollinators such as moths and butterflies. These insects (the order Lepidoptera) have more species and biomass than any other group of land herbivores and are a crucial component of food webs, directly impacting everything from trees and wildflowers to birds and bats. Some provide economically vital services.

The Minnesota State Wildlife Action Plan – which identifies conservation priorities for the next 10 years – is based on limited and fragmented knowledge of moths and butterflies. We lack products which unify existing data. As a result, conservation practitioners must make decisions unaware of what species might inhabit their lands, including those sensitive to management. Furthermore, Minnesotans want to know what lives in their state, but we can't provide even a simple species list. Hundreds of species await discovery because key areas of the state remain unexplored, and we have yet to thoroughly inventory museum collections.

**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.**

This proposal will build the first annotated checklist of Minnesota moths and butterflies, which will include species distributions, habitat associations, and conservation concerns. Efforts by the Minnesota Biological Survey – funded largely by ENRTF – have documented an impressive 1,940 species of moths and butterflies, including new state records and even species new to science. However, we expect 2500+ species in Minnesota, so numerous discoveries await. Field surveys will target poorly known areas of Minnesota and sites of biodiversity significance to fill key data gaps and add new species. Inventories of museums, private collections, data portals, and literature records will build a historical baseline to assess faunal changes. The checklist will consolidate this information into once place.

The second part of this project will share information through field visits and outreach events. Boots-on-the-ground visits with land managers and owners will improve conservation outcomes by sharing knowledge of habitat specialists and management sensitive species. Public field trips will showcase our state's rich moth and butterfly biodiversity to increase public appreciation and inspire the next generation of scientists.

We are seeking funding to support entomologist(s) to compile existing information, conduct surveys to gather new information, and conduct outreach.

**What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?**

The Annotated Checklist of Minnesota Moths & Butterflies will help practitioners conserve biodiversity by highlighting species restricted to rare habitats and/or sensitive to management. It will also foster Minnesotans' curiosity for the natural world and inspire the next generation of scientists. Visits with land managers and public field trips will further both points. Some of the many benefits of this project include:

- An improved State Wildlife Action Plan
- An improved Pollination Guide (ENRTF project ML2020-064).
- Improved guidance on managing lands for moths and butterflies
- Increased public support and appreciation of Minnesota's biodiversity

## 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: Compile data, conduct field surveys, produce checklist

**Activity Budget:** \$135,000

**Activity Description:**

We will compile data from museums, private collections, data portals, and experts. Data will be stored in the DNR Natural Heritage Information Systems (NHIS).

Field surveys will address data gaps. We will conduct at least 50 surveys spanning Minnesota’s four ecological provinces and key habitat types. Surveys will include sites of biodiversity significance and actively managed lands. Methods may include random meander diurnal searches, Mercury vapor sheets, Ultraviolet sheets/traps, fermenting fruit bait, pheromone traps, larval searches, and netting at flowers.

The final product – the first iteration of an Annotated Checklist of Minnesota Moths & Butterflies – will compile information into a single, compact reference. This will include information on species distributions, habitat associations, and conservation concerns. Refer to attached graphic.

**Activity Milestones:**

Description	Approximate Completion Date
Conduct at least 10 field surveys	November 30, 2024
Enter 2024 field season data into NHIS	April 30, 2025
Conduct at least 20 additional field surveys	November 30, 2025
Enter 2025 field season data into NHIS	April 30, 2026
Conduct at least 20 additional field surveys	November 30, 2026
Enter 2026 field season data into NHIS	April 30, 2027
Compile information from other data sources (museums, collections, publications) and incorporate into checklist	June 30, 2027
Complete first iteration of Minnesota Moth & Butterfly checklist	June 30, 2027

### Activity 2: Conduct outreach

**Activity Budget:** \$60,000

**Activity Description:**

We will meet with land managers and landowners to share findings, highlight unique species, and discuss conservation actions on their lands. For example, planning prescribed burns which incorporate unburned areas can help fire-sensitive species thrive. The annotated checklist will highlight management-sensitive species and provide general guidance; field visits can address site-specific concerns.

We will also conduct at least two public field trips to highlight Minnesota’s moth/butterfly biodiversity. Field trips would typically highlight the nocturnal side of this biodiversity, using lighted sheets and baits to attract moths – potentially up to 200 species on a good night. This is a particularly unique experience for Minnesotans. Venues may include state parks, county parks, national forests, or other lands.

**Activity Milestones:**

Description	Approximate Completion Date
Conduct at least 1 on-site visit with land managers and 1 public field trip	November 30, 2024

Conduct at least 1 additional on-site visit with land managers and 1 public field trip	November 30, 2025
Conduct at least 1 additional on-site visit with land managers and 1 public field trip	November 30, 2026

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
UMSP Insect Collection	University of Minnesota-St. Paul	specimen repository	No
Kyle Johnson	MNDNR - Minnesota Biological Survey	Lead Entomologist for this project	Yes

## 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.**

Physical specimens will ultimately be deposited in the University of Minnesota Entomology Collection or other research institution, where they will be available for study to researchers around the world. Data from these specimens will also be provided to these institutions (in addition to the DNR Natural Heritage Information Systems (NHIS)), where they will be widely accessible once added to the online public data portal SCAN (Symbiota Collections of Arthropods Network), which incorporates data from natural history collections across North America, in addition to iNaturalist, Bugguide, and other online resources. SCAN is proving to be a powerful resource in entomology research.

The annotated checklist will be in electronic format, available publicly on the MN-DNR website and promoted through various means, from public presentations and field trips to social media.

At least three public field trips will share the importance – and excitement – of our moth and butterfly fauna with Minnesotans in an up-close and personal way.

At least three on-the-ground site visits with land managers and landowners will share findings, highlight unique species, and discuss conservation actions on their lands.

The data and results of this project will be shared during this project and long into the future (potentially decades beyond the life of this project) at scientific conferences, technical meetings, and public education events. Currently, 2-4 of these events per year is typical, and is expected to increase with time.

## 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?**

This timeframe will produce results that can stand alone or contribute to a long-term Lepidoptera survey and monitoring program. The checklist (developed as part of activity one) can stand alone or be the first iteration in a series of progressively more impactful products.

The checklist will be disseminated electronically through a state website and promoted through social media and other channels. Survey results and lessons learned will also be disseminated through professional conference presentations, peer reviewed papers, and informal meetings with land managers.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Entomologist		Project manager, lead surveyor, data manager			21%	1.5		\$130,000
Information/Outreach Specialist		Assist with preparation of project products, web information			20%	0.1		\$10,100
							<b>Sub Total</b>	<b>\$140,100</b>
<b>Contracts and Services</b>								
TBD	Professional or Technical Service Contract	Lepidoptera field surveys				0.2		\$15,000
							<b>Sub Total</b>	<b>\$15,000</b>
<b>Equipment, Tools, and Supplies</b>								
	Tools and Supplies	Field survey and specimen supplies	To collect field data and prepare voucher specimens					\$11,012
							<b>Sub Total</b>	<b>\$11,012</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	Travel costs to field sites, in-state specimen collections and outreach events.	Conduct field surveys, confer with managers, review collection specimens and present information					\$12,000
							<b>Sub Total</b>	<b>\$12,000</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 Costs	Funds for agency support: people (\$2,935), safety (\$610), financial (\$2,546), communication (\$2,123), IT (\$7,637), planning (\$1,036)					\$16,888
							<b>Sub Total</b>	<b>\$16,888</b>
							<b>Grand Total</b>	<b>\$195,000</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>				
			<b>State Sub Total</b>	-
<b>Non-State</b>				
			<b>Non State Sub Total</b>	-
			<b>Funds Total</b>	-

## Attachments

### Required Attachments

#### *Visual Component*

File: [4ce06a9e-de1.pdf](#)

#### *Alternate Text for Visual Component*

Short description of how this project addresses needs and provides solutions. Images are of moths photographed in the field and a collection. Results are shown as images of species tables, a night time public moth field trip and a prescribed burn which benefited from data and analysis....

### Difference between Proposal and Work Plan

#### *Describe changes from Proposal to Work Plan Stage*

No changes beyond the addition of the "Dissemination" section.

## 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 agree travel expenses must 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 agree to the Commissioner's Plan.

**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

**Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?**

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 as "the provision of care, treatment, education, training, instruction, or recreation to children")?**

No