



Environment and Natural Resources Trust Fund

2024 Request for Proposal

General Information

Proposal ID: 2024-072

Proposal Title: Foundational Data for Moth and Butterfly Conservation

Project Manager Information

Name: Kyle Johnson

Organization: MN DNR - Ecological and Water Resources Division

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Project Basic Information

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.

Funds Requested: \$195,000

Proposed Project Completion: June 30, 2026

LCCMR Funding Category: Small Projects (H)

Secondary 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.

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

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 |
|--|-----------------------------|
| Compile data from museums, private collection, data portals, and experts | May 31, 2026 |
| Conduct at least 50 field surveys | June 30, 2026 |
| Complete first iteration of Minnesota Moth & Butterfly checklist | June 30, 2026 |

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 4 on-site visits with land managers | June 30, 2026 |
| Conduct at least 2 public field trips | June 30, 2026 |

Project Partners and Collaborators

| Name | Organization | Role | Receiving Funds |
|------------------------|----------------------------------|---------------------|-----------------|
| UMSP Insect Collection | University of Minnesota-St. Paul | specimen repository | 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?

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.

Project Manager and Organization Qualifications

Project Manager Name: Kyle Johnson

Job Title: Lepidoptera/Insect Survey Specialist

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

Kyle Johnson will lead project coordination, field surveys, outreach, and developing products. The project manager will be responsible for developing and implementing a work plan including achievable outcomes and reporting on project progress.

Mr. Johnson has studied entomology for 33 years – since the age of five – including 14 years working as an entomologist for the Minnesota Biological Survey. During this time, he has designed and implemented moth/butterfly field surveys throughout the state, including all 26 ecological subsections. This field worked has resulted in the discovery of at least 1,940 species, including countless new state records and even new species to science.

Bachelor of Science in Entomology, University of Wisconsin-Madison (December 2006)

Master’s of Science in Entomology, University of Wisconsin-Madison (June 2011)

Member of the WI Entomological Society, MI Entomological Society, Lepidopterists’ Society, Society of Kentucky Lepidopterists, and MI Lepidoptera Survey Committee. Current President of WI Entomological Society. Major participant on the Threatened/Endangered and Species of Greatest Conservation Need invertebrate review panels for MN, WI, and MI.

Organization: MN DNR - Ecological and Water Resources Division

Organization Description:

The work described in this proposal is consistent with the conservation priorities of the Minnesota Department of Natural Resources (MNDNR).

MNDNR 10-year Strategic Conservation Agenda

Goal 1. Minnesota's waters, natural lands, and diverse fish and wildlife habitats are conserved and enhanced.

Goal 4. Identify natural resources most in need of protection and management.

MNDNR Minnesota's Wildlife Action Plan

Goal 1. Ensure the long-term health and viability of Minnesota's wildlife, with a focus on species that are rare, declining, or vulnerable to decline.

Budget Summary

| Category / Name | Subcategory or Type | Description | Purpose | Gen. Ineligible | % Benefits | # FTE | Classified Staff? | \$ Amount |
|---------------------------------------|--|--|--|-----------------|------------|-------|-------------------|------------------|
| Personnel | | | | | | | | |
| 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 |
| | | | | | | | Sub Total | \$140,100 |
| Contracts and Services | | | | | | | | |
| TBD | Professional or Technical Service Contract | Lepidoptera field surveys | | | | 0.2 | | \$15,000 |
| | | | | | | | Sub Total | \$15,000 |
| Equipment, Tools, and Supplies | | | | | | | | |
| | Tools and Supplies | Field survey and specimen supplies | To collect field data and prepare voucher specimens | | | | | \$11,012 |
| | | | | | | | Sub Total | \$11,012 |
| Capital Expenditures | | | | | | | | |
| | | | | | | | Sub Total | - |
| Acquisitions and Stewardship | | | | | | | | |
| | | | | | | | Sub Total | - |
| Travel In Minnesota | | | | | | | | |
| | Miles/ Meals/ Lodging | Travel costs to field sites and outreach events. | Conduct field surveys, confer with managers, present information | | | | | \$12,000 |
| | | | | | | | Sub Total | \$12,000 |
| Travel Outside Minnesota | | | | | | | | |
| | | | | | | | Sub Total | - |

| | | | | | | | | |
|---------------------------------|--|--------------------------|--|--|--|--|--------------------|------------------|
| Printing and Publication | | | | | | | | |
| | | | | | | | Sub Total | - |
| Other Expenses | | | | | | | | |
| | | 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 |
| | | | | | | | Sub Total | \$16,888 |
| | | | | | | | Grand Total | \$195,000 |

Classified Staff or Generally Ineligible Expenses

| Category/Name | Subcategory or Type | Description | Justification Ineligible Expense or Classified Staff Request |
|---------------|---------------------|-------------|--|
|---------------|---------------------|-------------|--|

Non ENRTF Funds

| Category | Specific Source | Use | Status | Amount |
|------------------|-----------------|-----|----------------------------|--------|
| State | | | | |
| | | | State Sub Total | - |
| Non-State | | | | |
| | | | Non State Sub Total | - |
| | | | Funds Total | - |

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....

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