



# Environment and Natural Resources Trust Fund

2024 Request for Proposal

## General Information

**Proposal ID:** 2024-192

**Proposal Title:** Assessing Prairie Health to Inform Pollinator Conservation

## Project Manager Information

**Name:** Erik Runquist

**Organization:** Minnesota Zoological Society

**Office Telephone:** (952) 431-9562

**Email:** Erik.Runquist@state.mn.us

## Project Basic Information

**Project Summary:** We will assess the environmental quality of prairies across Minnesota. On-the-ground surveys and contaminant risk assessments will help inform partner management actions, endangered species recovery plans, and pollinator reintroduction efforts.

**Funds Requested:** \$297,000

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

**LCCMR Funding Category:** Foundational Natural Resource Data and Information (A)

## Project Location

**What is the best scale for describing where your work will take place?**

Statewide

**What is the best scale to describe the area impacted by your work?**

Statewide

**When will the work impact occur?**

During the Project and In the Future

## Narrative

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

Minnesota's fragmented prairies are important legacies of one of the world's most endangered ecosystems. The recovery of two U.S. and Minnesota Threatened and Endangered prairie butterflies will depend on the re-establishment of dozens of lost populations into fragmented prairie remnants across their range, including in Minnesota, via reintroductions. The Minnesota Zoo has established large foundational propagation programs for these globally imperiled butterflies and has begun reintroductions of Dakota skippers with prior ENRTF support. Since 2014, Minnesota Zoo scientists have also been annually documenting widespread and predictable annual presence of dozens of pesticides within several Minnesota prairies that are designated Critical Habitat for these protected species. To improve the likelihood of success for future additional reintroductions, we need a better understanding of the suitability of candidate sites, including the extent of risks from non-target pesticides, invasive species, and other stressors. For example, it is not known if there are locations where non-target pesticide occurrence is lower. Beyond these flagship endangered pollinators, the health of Minnesota's prairie remnants are vital to broad swaths of grassland-dependent wildlife like songbirds and bison, many of which are also imperiled, as well as to the environmental legacy cherished by Minnesotans.

### **What is your proposed solution to the problem or opportunity discussed above? Introduce us to the work you are seeking funding to do. You will be asked to expand on this proposed solution in Activities & Milestones.**

We propose to conduct habitat quality inventories of more than a dozen prairies across Minnesota. In collaboration with all partners, we will leverage and expand upon existing resources and databases to refine the sites of interest, spanning federal, tribal, state, regional, and private management. The sites will likely include both protected remnants as well as restored prairies. We will conduct on-the-ground assessments at selected sites, scoring them based on a series of variables related to ecological conditions that we will develop in consultation with partners. A key filter for these assessments will be the habitat characteristics associated with endangered skipper butterflies. Variables may include the distribution and composition of preferred adult and larval host plants and other resources for the listed butterflies, the prevalence of invasive species, suitable hydrology, the extent of potentially suitable habitat, landscape context, and the likelihood for compatible management. We will also expand our sampling of non-target pesticide occurrence from the current three prairie preserves that the Minnesota Zoo has been annually studying to more than a dozen sites. We will collect samples multiple times per year from selected prairies to screen for the quantities of more than 200 pesticides at a nationally respected lab.

### **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?**

We will provide an update on the quality and ecological condition of prairies across Minnesota. This inventory will help advance conservation goals and management planning for not only federally and state protected butterflies with the eventual goal of helping to meet formal federal recovery thresholds, but also for broad swaths of wildlife that also depend on our grasslands. Identifying areas where non-target pesticide occurrences are low could be further considered for endangered butterfly reintroductions, and strategies can be developed to reduce risk in areas of relatively high pesticide occurrence. This project will facilitate communication across a wide range of partners.

## Activities and Milestones

### Activity 1: Prairie Quality Inventories

**Activity Budget:** \$119,700

**Activity Description:**

In collaboration with partners, we will develop metrics to assess the ecological conditions of prairies across Minnesota. These will be centered around the vegetative characteristics suitable for federally listed prairie butterflies to refine the list of candidate sites for future reintroductions but the assessments will also be broadly informative for many prairie species. We will refine the list of sites to be studied, leveraging existing partner knowledge and relevant databases, and then conduct on-the-ground surveys as needed to characterize site conditions. We expect at least a dozen sites will be ultimately selected.

**Activity Milestones:**

| Description   | Approximate Completion Date |
|---|-----------------------------|
| Develop metrics for ecological condition assessments in collaboration with partners | December 31, 2024           |
| Refine list of sites for on-the-ground surveys.                                     | April 30, 2025              |
| Complete site surveys   | May 31, 2027                |

### Activity 2: Pesticide risk assessment

**Activity Budget:** \$177,300

**Activity Description:**

We will collect samples of the putative host plants of the federally- and State-listed prairie butterflies and potentially other matrices (soil, duff, etc.) and have them analyzed for pesticide composition and quantities. We will collect samples from at least a dozen prairies multiple times in a growing season (such as late spring and late summer) over multiple years to improve our understanding of the variation in compound types and quantities that may be present at a site. We will collect multiple samples from throughout each site per season.

**Activity Milestones:**

| Description   | Approximate Completion Date |
|---|-----------------------------|
| Refine list of sites for sample collections; collect Year 1 Summer samples and submit | September 30, 2024          |
| Collect Year 1 of Spring samples and submit for pesticide analysis                    | June 30, 2025               |
| Collect Year 2 of Summer samples and submit for pesticide analysis                    | September 30, 2025          |
| Collect Year 2 of Spring samples and submit for pesticide analysis                    | June 30, 2026               |
| Collect Year 3 of Summer samples and submit for pesticide analysis                    | September 30, 2026          |
| Collect Year 3 of Spring samples and submit for pesticide analysis                    | June 30, 2027               |

## Project Partners and Collaborators

| Name                   | Organization  | Role   | Receiving Funds |
|------------------------|---|--|-----------------|
| Marissa Ahlering, PhD  | The Nature Conservancy  | Coordination of site visits and research facilitation with The Nature Conservancy's preserves.                   | No              |
| Brandon Semel, PhD     | US Fish and Wildlife Service  | Facilitate site visits and planning in and near Big Stone National Wildlife Refuge.                              | No              |
| Ed Quinn               | Minnesota Department of Natural Resources, Division of Parks and Trails   | Coordination of site selection, visits, and planning with Minnesota State Parks.                                 | No              |
| Tamara Smith           | US Fish and Wildlife Service  | Coordination of US Endangered Species related regulations and recovery planning for Poweshiek skipperling        | No              |
| Araceli Morales Santos | US Fish and Wildlife Service  | Coordination of US Endangered Species related regulations and recovery planning for Dakota skipper               | No              |
| Sarah Warner           | US Fish and Wildlife Service  | Coordination of contaminants risk analysis for Poweshiek skipperling and other federally listed prairie species. | No              |
| Ferin Davis Anderson   | Shakopee Mdewakanton Sioux Community                                      | Coordination of site visits and planning on SMSC lands.  | No              |
| Sara Vacek             | US Fish and Wildlife Service  | Coordination of site visits, selection, and planning within the Morris Wetland Management District.              | No              |
| Mike Budd              | US Fish and Wildlife Service  | Coordination of site visits, selection, and planning within Northern Tallgrass Prairie National Wildlife Refuge. | No              |
| John Moriarity         | Three Rivers Park District  | Coordination of site visits and planning within Three Rivers Park District Reserves.                             | No              |
| Tom Lewanski           | Dakota County Parks   | Coordination of site visits and planning within Dakota County Parks.   | No              |
| Judy Schulte           | Minnesota Department of Natural Resources, Ecological and Water Resources | Coordination of site visits, selection, and planning within Scientific and Natural Areas.                        | No              |
| Theresa Cira, PhD      | Minnesota Department of Agriculture                                       | Consultation on pesticides occurrence monitoring data.   | 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?**

The information resulting from this monitoring and inventory will be help project partners develop tailored management plans. The goal of this project is to provide a snapshot of the ecological condition of studied prairies and does not necessarily trigger additional long-term monitoring or actions. Given the breadth of sites that we hope to study, any additional steps will likely be done on an individual basis by project partners, although there may be some resulting management recommendations that are shared across partner sites.

## Other ENRTF Appropriations Awarded in the Last Six Years

| Name  | Appropriation   | Amount Awarded |
|---|---|----------------|
| Saving Endangered Pollinators through Data-Driven Prairie Restoration | M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 08a | \$800,000      |

## Project Manager and Organization Qualifications

**Project Manager Name:** Erik Runquist

**Job Title:** Conservation Research Scientist

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

Dr. Runquist has served as the manager of the Minnesota Zoo's Prairie Butterfly Conservation Program since its founding in 2012. He has fostered development of foundational propagation programs for globally endangered Minnesota butterflies, and led research into the stressors on wild populations and on the conditions needed to for their recovery. In addition to establishing relationships with dozens of partners spanning local, tribal, regional, State, federal, and international agencies and organizations, Dr. Runquist is a trained ecologist. He has served as the P.I. for three prior ENRTF appropriations as well as several cooperative funding agreements from the US Fish and Wildlife Service.

**Organization:** Minnesota Zoological Society

**Organization Description:**

The mission of the Minnesota Zoo is to connect people, animals, and the natural world to save wildlife. Serving as Minnesota's largest environmental learning center, the Minnesota Zoo is also a global leader in conservation programs. Designated as a State Pollinator Bank, the Minnesota Zoo has established foundational science-based propagation and translocation conservation programs for globally endangered Minnesota native butterflies. The Minnesota Zoo, a unique state agency, is also an accredited member of the Association of Zoos and Aquariums, and an institutional member of the Alliance of Marine Mammal Parks and Aquariums and the World Association of Zoos and Aquariums.

## Budget Summary

| Category / Name                            | Subcategory or Type                        | Description   | Purpose  | Gen. Ineligible | % Benefits | # FTE | Classified Staff? | \$ Amount        |
|--|--|---|--|-----------------|------------|-------|-------------------|------------------|
| <b>Personnel</b>                           |  |   |  |                 |            |       |                   |                  |
| Project Manager and Conservation Scientist |  | Coordination of all activities, collection of field data, and communications among all partners.  |  |                 | 29%        | 0.45  | X                 | \$68,000         |
| Biologist                                  |  | Collection of field data and support for assessments and decision making processes  |  |                 | 22%        | 0.45  | X                 | \$45,000         |
|  |  |   |  |                 |            |       | <b>Sub Total</b>  | <b>\$113,000</b> |
| <b>Contracts and Services</b>              |  |   |  |                 |            |       |                   |                  |
| TBD  | Professional or Technical Service Contract | Laboratory analysis to precisely quantify the presence of about 200 possible pesticides and their derivatives from all field collected samples. |  |                 |            | 0.15  |                   | \$162,000        |
|  |  |   |  |                 |            |       | <b>Sub Total</b>  | <b>\$162,000</b> |
| <b>Equipment, Tools, and Supplies</b>      |  |   |  |                 |            |       |                   |                  |
|  | Tools and Supplies                         | Dry ice. Averaging 1 block per 2 pesticide samples; \$20/block  | Field preservation of samples collected for pesticide analysis   |                 |            |       |                   | \$3,600          |
|  | Tools and Supplies                         | Boxes and shipping  | Secure packaging and shipping of samples to the laboratory for pesticides analysis   |                 |            |       |                   | \$600            |
|  | Tools and Supplies                         | Consumables for pesticides sample collections   | Bags, gloves, disinfecting materials, and other consumables for pesticide collections  |                 |            |       |                   | \$500            |
|  | Equipment                                  | GPS Units - 2   | Geolocation of sample collection points and other key sites of interest for condition assessments. Two are needed to allow for simultaneous work at different sites. |                 |            |       |                   | \$1,300          |
|  | Tools and Supplies                         | Coolers for field collections - 2   | High quality coolers are needed to maintain cold conditions to preserve samples over potentially multiple days in the field  |                 |            |       |                   | \$600            |

|                                     |                       |   |   |  |  |  |                    |                  |
|-------------------------------------|-----------------------|---|---|--|--|--|--------------------|------------------|
|                                     | Equipment             | Battery charger   | To maintain charge of field electronics, such as tablets, drones, etc., during field work |  |  |  |                    | \$400            |
|                                     |                       |   |   |  |  |  | <b>Sub Total</b>   | <b>\$7,000</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 | An average of 30 days of field work per year over three years = 90 field days. \$120/day for hotel, \$36/day for food. \$1000 for fuel. | Lodging, travel, and food costs to conduct all field work associated with this project    |  |  |  |                    | \$15,000         |
|                                     |                       |   |   |  |  |  | <b>Sub Total</b>   | <b>\$15,000</b>  |
| <b>Travel Outside Minnesota</b>     |                       |   |   |  |  |  |                    |                  |
|                                     |                       |   |   |  |  |  | <b>Sub Total</b>   | -                |
| <b>Printing and Publication</b>     |                       |   |   |  |  |  |                    |                  |
|                                     |                       |   |   |  |  |  | <b>Sub Total</b>   | -                |
| <b>Other Expenses</b>               |                       |   |   |  |  |  |                    |                  |
|                                     |                       |   |   |  |  |  | <b>Sub Total</b>   | -                |
|                                     |                       |   |   |  |  |  | <b>Grand Total</b> | <b>\$297,000</b> |

## Classified Staff or Generally Ineligible Expenses

| Category/Name  | Subcategory or Type | Description  | Justification Ineligible Expense or Classified Staff Request  |
|--|---------------------|--|---|
| Personnel - Project Manager and Conservation Scientist |                     | Coordination of all activities, collection of field data, and communications among all partners. | <b>Classified</b> : A classified staff position will be partially supported by these ENRTF funds. This staff member will have the necessary expertise required to successfully implement all Activities. The ENRTF funding will make it possible for the staff member to work on this project for the percentage of time indicated in the budget. Without this funding they would not be able to support this project with their time. Further, the nature of the success of this project necessitates some level of expertise coming from the Zoo, which this staff member will be instrumental in providing. Responsibilities for the classified staff will be reprioritized and reallocated as necessary to support this project.                          |
| Personnel - Biologist                                  |                     | Collection of field data and support for assessments and decision making processes               | <b>Classified</b> : A classified staff position will be partially supported by these ENRTF funds. This staff member will have the necessary expertise required to successfully execute all Activities, particularly in the field. The ENRTF funding will make it possible for the staff member to work on this project for the percentage of time indicated in the budget. Without this funding they would not be able to support this project with their time. Further, the nature of the success of this project necessitates some level of expertise coming from the Zoo, which this staff member will be instrumental in providing. Responsibilities for the classified staff will be reprioritized and reallocated as necessary to support this project. |



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: [69fe6162-e50.pdf](#)

#### *Alternate Text for Visual Component*

The graphic includes pictures of two prairies, one in good quality with a diversity of native species and the other that is degraded and bordering a crop field. The endangered Poweshiek skipperling and Dakota skipper butterflies are pictured. The graphic also describes goals to inventory prairie health and pesticides occurrences....

## 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