

**Environment and Natural Resources Trust Fund  
2019 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 202-F**

Saving Endangered Pollinators through Data-Driven Prairie Restoration

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**Category:** F. Methods to Protect, Restore, and Enhance Land, Water, and Habitat

**Sub-Category:**

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**Total Project Budget: \$** 977,813

**Proposed Project Time Period for the Funding Requested:** June 30, 2023 (4 yrs)

**Summary:**

Minnesota Zoo, Parks, and TNC will use prairie restorations and Endangered Dakota skipper reintroductions to study factors supporting butterflies and develop foundational habitat management recommendations for Minnesota's imperiled prairie butterflies.

**Name:** Erik Runquist

**Sponsoring Organization:** Minnesota Zoo

**Title:** Butterfly Conservation Biologist

**Department:** \_\_\_\_\_

**Address:** 13000 Zoo Blvd

Apple Valley MN 55124

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

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

**Web Address** \_\_\_\_\_

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**Location**

**Region:** Central, Metro, Northwest, Southwest

**County Name:** Clay, Dakota, Lincoln, Pipestone, Pope, Ramsey

**City / Township:**

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**Alternate Text for Visual:**

Dakota Skippers, and many other prairie butterflies, have disappeared from much of Minnesota. Identifying how to best enhance habitat, such as increasing native purple coneflowers, is needed to sustain populations.

|   |                         |                             |                      |
|---|-------------------------|-----------------------------|----------------------|
| _____ Funding Priorities                      | _____ Multiple Benefits | _____ Outcomes              | _____ Knowledge Base |
| _____ Extent of Impact                        | _____ Innovation        | _____ Scientific/Tech Basis | _____ Urgency        |
| _____ Capacity                                | _____ Readiness         | _____ Leverage              | _____ TOTAL _____%   |
| _____ If under \$200,000, waive presentation? |                         |                             |                      |



**Environment and Natural Resources Trust Fund (ENRTF)**  
**2019 Main Proposal Template**

**PROJECT TITLE: Saving Endangered Pollinators through Data-driven Prairie Restoration**

**I. PROJECT STATEMENT**

**Goals:** The Minnesota Zoo, DNR's Division of State Parks and Trails, and The Nature Conservancy (TNC) will develop a unique conservation research partnership to help save Minnesota's endangered prairie butterflies by:

- 1) Assessing factors associated with the disappearance of imperiled Minnesota prairie butterflies.
- 2) Restoring prairie at Glacial Lakes State Park to support endangered butterflies and other pollinators.
- 3) Reintroducing the US-Threatened/MN-Endangered Dakota skipper butterfly from the Zoo to TNC's Hole-in-the-Mountain Prairie Preserve (HIMPP) and Glacial Lakes State Park, where, until recently, it was common.
- 4) Developing foundational habitat management recommendations to sustain Dakota skipper populations.
- 5) Supporting Federal and State and Recovery and Risk Assessments for the Dakota skipper through conservation rearing, breeding, and wild reintroductions.

**Opportunity:** Many of Minnesota's prairie butterflies are disappearing at alarming rates, with some in danger of global extinction. Recovery of these pollinators depends on efforts to return them to prairies where they have disappeared and to manage habitat to promote their successful reestablishment.

**Actions:** We will help reestablish recently lost populations of Minnesota Endangered butterflies through reintroductions, habitat improvements, and advancing our understanding of what is needed to save them. We hypothesize that decreases in the Dakota skipper's preferred nectar plant (narrow-leaved purple coneflower) contributed to their recent extinction at sites like Glacial Lakes State Park, where pesticide drift and other external threats appear to be lower. We will study how reintroduced Dakota skippers respond to prairie wildflower augmentations and/or manipulations at Glacial Lakes and HIMPP, the latter of which already has high densities of blooming coneflower. Our work will help develop a management toolkit for restoring lost prairie butterfly populations and identifying additional reintroduction locations. We will help satisfy MS 86A.05 subd. 2(c) to "reestablish desirable plants and animals that were formerly indigenous to the park area but are now missing", as well as the goals of the Minnesota Prairie Conservation Plan, Minnesota State Wildlife Action Plan, and Monarch Joint Venture. Prairie restoration at Glacial Lakes State Park will benefit all pollinators, wildlife, and the Park's 56,000+ annual visitors.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** Enhancing Prairie at Glacial Lakes State Park for Pollinators

MN State Parks and Trails will restore and enhance native prairies at Glacial Lakes State Park for the reintroduction of Dakota skipper. This will be done by 1) experimentally manipulating the density, abundance, etc. of certain native flowers/grasses within the range of natural variation for those species locally, 2) controlling woody species encroaching into native prairie, and 3) increasing native wildflower and grass densities in remnant and reconstructed prairie.

**ENRTF BUDGET: \$238,183**

| <b>Outcome</b>   | <b>Completion Date</b> |
|--|------------------------|
| 1. Establish plot locations/ design; plant 10,000 plugs of wildflower species known to be important for Dakota skippers and other pollinators                                      | November 2019          |
| 2. Finalize planning for experimental vegetation manipulation in established plots, implement year-1 manipulations   | October 2020           |
| 3. Diversify degraded remnant prairies and restorations (400 acres); reduce woody stems encroaching into prairie (200 acres), thin 50 acres of savanna adjacent to skipper habitat | June 2021              |

**Activity 2:** Reintroducing Endangered Prairie Butterflies

The Zoo will help save Minnesota's Threatened and Endangered butterflies through its foundational rearing, breeding, and release programs. The Zoo will produce at least 200 Dakota skippers annually, then release and monitor those individuals at HIMPP and then at Glacial Lakes State Park to help re-establish lost populations and understand conditions they need in the wild. Reintroductions at HIMPP began in 2017 and will be expanded to



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**2019 Main Proposal Template**

strengthen the viability of the population. Reintroductions at Glacial Lakes will occur once planted flowers mature and bloom.

**ENRTF BUDGET: \$579,000**

| Outcome  | Completion Date |
|--|-----------------|
| 1. Perform years 3, 4, and 5 of Dakota skipper reintroductions at HIMPP  | August 2021     |
| 3. Perform year 1 of Dakota skipper reintroductions and monitoring at Glacial Lakes State Park. Monitor Dakota skippers at HIMPP | August 2022     |
| 4. Establish plans for 2023 reintroductions and augmentations  | June 2023       |

**Activity 3:** Understanding prairie butterfly disappearance and factors needed for recovery

The Zoo will sponsor a University of Minnesota graduate student to compile and use historical data to assess factors associated with the disappearance of imperiled prairie butterflies like the Dakota skipper. Additionally, the student will study how purple coneflower density, management practices, pesticides drift, and other environmental factors alter prairie habitat and affect establishment of reintroduced Dakota skippers at HIMPP and Glacial Lakes. Results of the work can be applied broadly and scaled up to identify management actions and additional prairies for future Dakota skipper reintroductions.

**ENRTF BUDGET: \$160,000**

| Outcome  | Completion Date |
|--|-----------------|
| 1. Complete analysis of factors that have influenced disappearance of prairie butterflies from historically occupied sites   | July 2022       |
| 2. Collect plant, pesticides residue, and environmental data before and after experimental habitat management activities. Track the responses of reintroduced Dakota skippers to those manipulations.          | October 2022    |
| 3. Analyze data and use findings to develop habitat composition and management prescriptions to promote Dakota skipper population sustainability, and recommendations for additional reintroduction locations. | June 2023       |

**III. PROJECT PARTNERS:**

**A. Partners receiving ENRTF funding**

| Name     | Title                          | Affiliation         | Role                  |
|----------|--------------------------------|---------------------|-----------------------|
| Ed Quinn | Resource Management Supervisor | MN Parks and Trails | PAT's Project manager |

**B. Partners NOT receiving ENRTF funding**

| Name             | Title                  | Affiliation            | Role                                    |
|------------------|------------------------|------------------------|---|
| Marissa Ahlering | Lead Prairie Ecologist | The Nature Conservancy | Support at Hole-in-the-Mountain Prairie |

**IV. LONG-TERM- IMPLEMENTATION AND FUNDING:**

MNDNR Division of Parks & Trails has an extensive history restoring and maintaining high quality native prairies through regular, accepted practices for habitat management. Monies for these efforts will be provided through the Parks & Trails Legacy fund and the general fund. TNC plans to continue to manage the HIMPP to benefit native prairie diversity, including rare and threatened species such as the Dakota skipper. The Minnesota Zoo would continue rearing, breeding, and reintroduction efforts. The Glacial Lakes State Park Dakota skipper reintroduction would likely continue into 2024, with monitoring into 2026. Funding from as many sources as possible would be pursued, including the Minnesota Zoo, Minnesota Zoo Foundation, US Fish and Wildlife Service, ENRTF, and other grants.

**V. TIME LINE REQUIREMENTS:**

Key activities would occur in the 4-year timeframe as identified above.

**Project Title: Saving Endangered Pollinators Through Data-driven Prairie Restoration**

**IV. MINNESOTA ZOO TOTAL ENRTF REQUEST BUDGET: 4 years**

| <u>BUDGET ITEM</u>  | <u>AMOUNT</u>     |
|---|-------------------|
| <b>Personnel:</b><br>Butterfly Conservation Biologist (one State Program Administrator Principal at average 75% time, for FY20, FY21, FY22, & FY23; 68% toward salary and 32% toward benefits). \$315,000<br><br>Butterfly Conservation Specialist (one Research Scientist 1 at average 75% time, for FY20, FY21, FY22, & FY23; 77% of dollars toward salary and 23% toward benefits) \$229,000 | \$ 544,000        |
| <b>Contracts:</b><br>University of Minnesota Research Assistantship (50% Research Assistantship for a single graduate student; FY20, FY21, FY22), plus travel and supplies and pesticides sample analyses. The Zoo will seek other funds to support the student in FY23.  | \$ 160,000        |
| <b>Equipment/Tools/Supplies:</b><br>Breeding/Reintroduction: Plants, rearing supplies, collection and release supplies .  | \$ 22,000         |
| <b>Travel:</b><br>Mileage, lodging, meals for travel to and between Minnesota prairie sites for data collection and husbandry/reintroduction operations.  | \$ 10,000         |
| <b>Other:</b><br>Zoo travel expenses outside of MN. Mileage, lodging, meals for travel to and between prairie sites to obtain Dakota skippers for the Zoo conservation program. The largest viable populations of Dakota skipper butterflies are now outside of Minnesota, particularly in South Dakota and North Dakota, necessitating out of state travel.                                    | \$ 3,000          |
| <b>MINNESOTA ZOO TOTAL ENRTF \$ REQUEST =</b>   | <b>\$ 739,000</b> |

**IV. MN DNR PAT TOTAL ENRTF REQUEST BUDGET : 4 years**

| <u>BUDGET ITEM</u>   | <u>AMOUNT</u>     |
|--|-------------------|
| <b>Personnel:</b><br>Dedicated resource staff - native seed collection, cleaning and site preparation, prescribed burning, planting, vegetaion surveys, woody stem shearing, savanna thinning saw work and debris management. The amount per year will be 873.4 hours, times 4 years = 3,494.4 hours/2080 = 1.68 FTE.  | \$ 105,000        |
| <b>Contracts:</b><br>Native plant plugs grown from Glacial Lakes origin seed; tractor/mower trucking contracts   | \$ 38,000         |
| <b>Equipment/Tools/Supplies:</b><br>Hose-sprinklers for experimental exclusion of fire from plots, seeder/tractor supplies; usage costs of tractor/skidsteer to shear 200 acres, interseed 400 acres with truax and/or vicon seeder and cut pile 50 acres savanna. Seed harvest with Gleaner K combine, seed stripper and UTV. Herbicide application with backpack sprayers/UTV boom sprayers. | \$ 57,000         |
| <b>Travel:</b><br>Resource crew food, transportation costs   | \$ 25,000         |
| <b>Other:</b><br><b>Additional Budget Items:</b> *Direct and necessary expenses: HR Support (~\$2,482), Safety Support (~\$514), Financial Support (~\$2,885), Communications Support (~\$1,251), IT Support (\$5,622), Planning Support (~\$1,059) necessary to accomplish funded project.  | \$ 13,813         |
| <b>MINNESOTA DNR PAT TOTAL ENRTF \$ REQUEST =</b>  | <b>\$ 238,813</b> |
| <b>ZOO + DNR PAT TOTAL ENRTF \$ REQUEST =</b>  | <b>\$ 977,813</b> |

**V. OTHER FUNDS**

| <u>SOURCE OF FUNDS</u>   | <u>AMOUNT</u> | <u>Status</u>     |
|--|---------------|-------------------|
| <b>Other Non-State \$ Being Applied to Project During Project Period:</b> Zoo: Minnesota Zoo Foundation; additional funding for pesticides residue analysis and supplies   | \$ 20,000     | Pending           |
| <b>Other State \$ Being Applied to Project During Project Period:</b> Zoo: Legacy Amendment Arts and Cultural Heritage Fund. ~25% salary and benefits for the two Zoo personnel identified above, for FY20-23, and a summer student worker FY20-23   | \$ 228,000    | Pending           |
| <b>In-kind Services During Project Period:</b>   |               |                   |
| <b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b> Zoo: M.L. 2016, Chp. 186, Chp. 2, Sec. 2, Subd. 03c1. "Prairie Butterfly Conservation, Research, and Breeding – Phase II". The amount listed here is remainder of April 2018, and will be expended by the end of FY19. | \$ 275,431    | Legally Obligated |



| #      | Acquisition or Restoration Parcel Name | Geographic Coordinates<br>(preferably from the center of the parcel)<br>Format: [Deg.]° [Min.]' [Sec.]" [Hemis.] |               | Estimated Cost | Estimated Annual PILT Liabilities | County | Site Significance<br>(please include what ecosystem (e.g., prairie, forest, wetland, savanna) is represented as well as the ecological significance, site importance, conservation value, and public benefits) | Activity Description<br>(e.g. fee title acquisition, conservation easement acquisition, site preparation, restoration)   | # of Acres | # of Shoreline Miles | Type of Landowner<br>(private individual or trust, non-profit organization, for-profit entity) | Proposed Fee Title or Easement Holder<br>(if applicable) | Status of work<br>(e.g. engaged in landowner negotiations, no longer in consideration, restoration activities underway) |
|--------|--|--|---------------|----------------|-----------------------------------|--------|--|--|------------|----------------------|--|--|---|
|        |  | Latitude   | Longitude     |                |                                   |        |  |  |            |                      |  |  |   |
| 1      | Glacial Lakes State Park               | 45 32' 01.793  | 95 30' 33.197 | \$ 78,813      |                                   | Pope   | MN Critically Imperiled Dy Hill Oak Savanna  | reduce overstory trees, shear regrowth and seed native prairie species as needed   | 50         |                      | Public, state MN   |  | begin, Jul 2018   |
| 2      | Glacial Lakes State Park               | 45 32' 01.793  | 95 30' 33.197 | \$60,000       |                                   | Pope   | MN Imperiled Dry Sand Gravel Prairie   | reduce woody encroachment into remnant native prairie, especially adjacent to high quality remnant prairie   | 200        |                      | Public, state MN   |  | begin, Jul 2018   |
| 3      | Glacial Lakes State Park               | 45 32' 01.793  | 95 30' 33.197 | \$ 100,000     |                                   | Pope   | MN Imperiled Dry Sand Gravel Prairie   | add forb and grass diversity to remnant and restored dry sand gravel prairies to enhance endangered prairie pollinator habitat, including seeding and transplant plugs | 400        |                      | Public, state MN   |  | begin, Jul 2018   |
| 4      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 5      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 6      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 7      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 8      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 9      |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| 10     |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |
| NOTES: |  |  |               |                |                                   |        |  |  |            |                      |  |  |   |

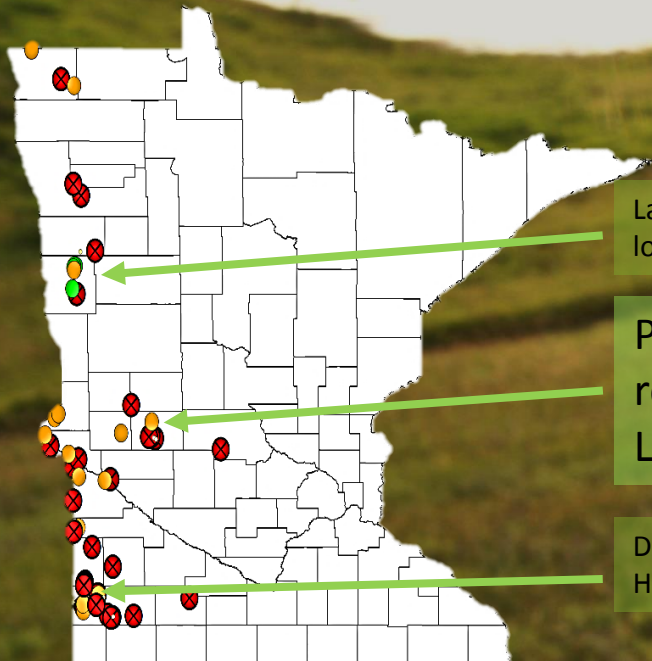


# Saving Endangered Prairie Pollinators through Data-driven Habitat Restoration



A reintroduced, Federally Threatened, **Dakota skipper** at Hole-in-the-Mountain Prairie Preserve.

Minnesota Zoo, Parks and Trails, and The Nature Conservancy will use prairie restorations and Dakota skipper reintroductions to study factors affecting Minnesota Endangered butterflies and develop foundational management recommendations for imperiled Minnesota prairie butterflies.



Last known Dakota skipper location in MN

Proposed Dakota skipper reintroduction at Glacial Lakes State Park

Dakota skipper reintroductions at Hole-in-the-Mountain Prairie Preserve

**Dakota Skipper Occurrence**  
● Present  
● Possibly Extinct  
● Extinct

Narrow-leaved coneflower is important for many Minnesota pollinators, including the US Threatened and MN Endangered Dakota skipper. It is now uncommon in some prairies though. We will study how varying blooming densities of this wildflower and other native prairie plants through different management techniques influences reintroduction success of Dakota skippers.



**ORGANIZATION DESCRIPTION: Minnesota Zoological Garden**

The Minnesota Zoo, a state agency established in 1978 to provide Minnesota residents and guests with a unique opportunity to experience animals from the exotic to the familiar, is today one of the State's premier cultural, educational, and conservation institutions.

The Zoo's mission is *to connect people, animals and the natural world to save wildlife*. With over 1.2 million guests a year and state-wide outreach programs, the Zoo is in a unique position to strengthen Minnesotans' awareness and understanding of our State's cultural commitment to wildlife, science and conservation. The Zoo is, in fact, the State's largest environmental educator.

The Minnesota Zoo has also become a worldwide leader in conservation – conducting breeding programs and field efforts at the Zoo, in Minnesota, and across the globe. The Zoo has recently enhanced its efforts to focus on Minnesota wildlife and habitats, including efforts to conserve Minnesota's moose, bison, prairie butterfly, freshwater mussel, and turtle populations. It is also working to restore undeveloped areas on its own 485 acre site to native conditions, and exploring ways to provide educational opportunities to interpret those efforts.

The Zoo has a proven record of using its resources efficiently and effectively, *matching* the State's investment with private funds and earned income.

**ZOO PROJECT MANAGER: Erik Runquist, PhD**

Erik Runquist is the Butterfly Conservation Biologist at the Minnesota Zoo where he has coordinated the Prairie Butterfly Conservation Program since its inception in 2012. He manages research, personnel, and budgets for the Program. Erik holds a PhD in Ecology with an emphasis in Conservation Biology from the University of California, Davis and studied butterflies for his doctoral degree.

**ORGANIZATION DESCRIPTION: Minnesota Department of Natural Resources Division of Parks & Trails**

The Department of Natural Resources-Division of Parks and Trails operates 67 state parks, 9 state recreation areas, 25 state trail segments, 1,496 water access sites, 33 water trails and 8 state waysides throughout Minnesota. The Division is responsible for protecting, managing & restoring natural and cultural resources and providing outstanding park, trail and water recreation experiences for visitors.

**DNR PROJECT MANAGER: Edward Quinn**

Ed Quinn oversees the natural/cultural resource management program for the Division of Parks & Trails. He provides direction for and coordination of 17 Parks & Trails resource management specialists and technicians. The program is responsible for protecting, managing and restoring natural/cultural resources on division-administered lands. Annually the division restores approximately 840 acres of prairie, forest & wetlands, conducts prescribed burns on about 5,800 acres and manages invasive species on approximately 10,000 acres.

Ed has worked in the natural resource field for 35 years (20 with MNDNR). He has been employed as a naturalist, wildlife biologist and natural areas manager. He has overseen the MNDNR Parks & Trails resource program since 1998. He holds a bachelor's degree in Fish & Wildlife from Michigan State University and a master's degree in Biological Sciences from the University of Minnesota. He has been a certified wildlife biologist since 1994.

