**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 plants 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, identifying additional reintroduction locations, and helping to remove Dakota skippers from the U.S. Threatened Species list. 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”, the Minnesota Zoo’s statutory role as a Pollinator Bank for the State of Minnesota (MS 85A.02 subd. 2), 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**

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| **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: $238,812** | |  | |
| **Outcome** | **Completion Date** |
| 1. Establish plot locations/ design; plant 10,000 plugs of wildflower species known to be important for Dakota skippers and other pollinators | November 2020 |
| 2. Finalize planning for experimental vegetation manipulation in established plots, implement year-1 manipulations | October 2021 |
| 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 2022 |
| **Activity 2:**Reintroducing Endangered Prairie Butterflies  The Minnesota 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 strengthen the viability of the population. Reintroductions at Glacial Lakes will occur once planted flowers mature and bloom.  **ENRTF BUDGET: $621,103** | |  |
| **Outcome** | **Completion Date** |
| 1. Perform years 4 and 5 of Dakota skipper reintroductions at HIMPP | August 2022 |
| 3. Perform year 1 of Dakota skipper reintroductions and monitoring at Glacial Lakes State Park. Monitor Dakota skippers at HIMPP | August 2023 |
| 4. Establish plans for 2024 reintroductions and augmentations | June 2024 |

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| **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 Lake23s. 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: $165,000** | |  |
| **Outcome** | **Completion Date** |
| 1. Complete analysis of factors that have influenced disappearance of prairie butterflies from historically occupied sites | July 2023 |
| 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 2023 |
| 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 2024 |

**III. PROJECT PARTNERS AND COLLABORATORS:**

The Minnesota Zoo portion will be led by Project Manager Dr. Erik Runquist, Prairie Butterfly Conservation Biologist. The Minnesota DNR State Parks and Trails portion will be managed by Edward Quinn, Resource Management Supervisor. The Nature Conservancy (Dr. Marissa Ahlering, Lead Prairie Ecologist) will provide support through habitat management and related data collection at the Hole-in-the-Mountain Prairie Preserve. The Nature Conservancy would not receive ENRTF support for this project.

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

We seek to develop a toolkit that will provide guidance to land managers, and to advance pollinator conservation statewide. The results of our efforts will be compiled and submitted for peer-reviewed scientific publication. 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 2025, with monitoring into 2027. 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.