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

Project Title: **ENRTF ID: 203-F**

Evaluating Ecological Benefits of Prairie Plan Restorations

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

Sub-Category:

Total Project Budget: $ 534,468

Proposed Project Time Period for the Funding Requested: June 30, 2022 (3 yrs)

Summary:

Evaluating ecological outcomes of prairie restorations under the Minnesota Prairie Conservation Plan by spatially tracking accomplishments, monitoring indicators of ecosystem functioning, and creating metrics of success to improve future restorations.

Name: Jessica Petersen

Sponsoring Organization: MN DNR

Title: Research Scientist

Department: Division of Fish and Wildlife

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Web Address

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Prairie Plan Core map and conceptual diagram of the foundations of effectiveness monitoring (multi-agency accomplishments database, metrics of restoration success, and indicators of ecosystem function) resulting in improved prairie restoration.

_____ 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?			

PROJECT TITLE: Evaluating Ecological Benefits of Prairie Plan Restorations

I. PROJECT STATEMENT

Goal(s): The Minnesota Prairie Conservation Plan Science Team will build the foundation for long-term evaluation of Prairie Plan success by (1) coordinate a spatially explicit GIS database to track accomplishments across all Prairie Plan partners, (2) establish indicators of prairie restoration success, (3) collecting retrospective and baseline data on ecological indicators (grassland bird, pollinator, and plant communities) of ecosystem functioning in and around prairie restorations to identify factors leading to success, and (4) recommend ways to improve efficiency and effectiveness of future restorations.

The prairie ecosystem is almost entirely gone in Minnesota, resulting in fragmented native prairie that barely supports viable populations of prairie-dependent wildlife and plants. The Minnesota Prairie Conservation Plan is a multi-agency partnership (MNDNR, USFWS, TNC, BWSR, NRCS, Audubon, The Conservation Fund, Ducks Unlimited, Pheasants Forever, and the Minnesota Prairie Chicken Society) established in 2011 to create *functioning* landscapes that filter and store water, provide habitat for prairie-dependent flora and fauna, provide recreational opportunities, and are resilient to environmental change. The cooperative conservation actions to meet these goals include prairie restorations, protections, and enhancements.

To evaluate the effectiveness of Prairie Plan actions to meet the goal of creating functioning landscapes, we need to identify when and where actions are and will be happening. There is a need to synthesize existing data across partners to build a comprehensive, spatially explicit database for tracking Prairie Plan actions from all funding sources. Partners have existing datasets, but there is a need to collate those efforts in order to monitor ecological outcomes at the spatial scale of the Prairie Plan. The database will set the groundwork for a series of projects that expand upon the monitoring proposed here to include enhancement activities (grazing, burning, and woody removal) and indicators of ecosystem functioning such as water quality.

Of the three Prairie Plan actions (protect, enhance, restore), restoring prairie to connect fragmented habitat is essential to improve ecosystem function. Grassland birds, prairie pollinators, and prairie plant communities are important components that define indicators of successful prairie restorations and ecosystem functioning. Indicators of success will be framed upon native prairie as the reference habitat (e.g., a certain number prairie-dependent pollinator species present) and can be used to evaluate existing restorations and guide future restoration planning.

To date, millions of dollars have been spent to restore prairie in Minnesota. While some restoration evaluation does occur, we will expand the level of monitoring to the level necessary for partners to better evaluate outcomes of the Prairie Plan. Most existing monitoring projects in Minnesota focus on native prairies with limited ecological evaluation of restored prairies. Our work builds upon established efforts previously supported by LCCMR to further refine the definition of Prairie Plan success. The outcomes of this project will create more effective and efficient prairie restorations on the 420,000 acres of prairie remaining to be restored to eventually meet the goals of the Prairie Plan.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: Document Prairie Plan accomplishments. *Coordinate a GIS database to spatially track Prairie Plan accomplishments including restorations since the initiation of the Prairie Plan (2011) and planned restorations. We will synthesize existing datasets among partners and create new data to fill in the recording gaps where necessary. This publicly accessible database will build the foundation for evaluating other measures of success of the Prairie Plan and will allow for efficiency of planning within the research community in Minnesota. For example, this database will be used to identify locations to measure the impact of restorations on water quality.*

ENRTF BUDGET: $ 102,369

Outcome	Completion Date
1. Coordinate a GIS database of spatially tracked Prairie Plan actions.	*July 2021*

Activity 2: Establish benchmarks for prairie restoration success, survey wildlife indicators of ecosystem functioning, and communicate results to improve restoration efficiency and effectiveness for reaching the benchmarks. *Establish indicators of success for prairie restorations using existing data sources (e.g., Grassland Monitoring Team), literature, and expert opinions. Measure and evaluate the site-level and landscape-level response of grassland birds and pollinators to existing prairie restorations in prairie core areas in western Minnesota. These data will provide a retrospective analysis of restorations since the establishment of the Prairie Plan in 2011. Monitor the pollinator and grassland bird communities in the landscapes within and surrounding planned restorations. These data will provide a baseline for future monitoring after the restorations are completed. Evaluate the effectiveness of existing restorations based on established indicators of success for grassland birds, prairie pollinators, and prairie plants. Inform future restoration planning of factors that lead achieve success.*

ENRTF BUDGET: $432,099

Outcome	Completion Date
*1. Establish indicators of restoration success for **pollinators, birds, and plants** from literature, ongoing projects and expert opinion in comparison with native prairie as a reference target goal.*	*May 2020*
*2. Collect indicator metrics on **pollinators, birds, and plants** to evaluate restoration success and establish baseline data in up to 30 restorations in multiple cores, year 1.*	*October 2020*
*3. Collect indicator metrics on **pollinators, birds, and plants** to evaluate restoration success and establish baseline data in up to 30 restorations in multiple cores for year 2.*	*October 2021*
4. Complete a retrospective data analysis of existing restorations and evaluate factors that achieve success. Communicate results to land managers and the Prairie Plan State Work Group by recommending ways to improve restorations.	*July 2022*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding N/A

B. Partners NOT receiving ENRTF funding: All partners listed make up the Prairie Plan Science Team, a group that developed to coordinate the ecological monitoring associated with the Prairie Plan.

Name	Affiliation
Dr. Marissa Ahlering (Lead Prairie Ecologist)	The Nature Conservancy
Daren Carlson (Monitoring Coordinator), Dr. Fred Harris (Plant Ecologist), Dr. Danelle Larson (Water Specialist), Dr. Véronique St-Louis (Wildlife Biometrician), Mike Worland (Nongame Biologist)	Minnesota DNR (Ecological and Water Resources and Fish and Wildlife Divisions)
Kristin Hall (Bird Conservation Program Manager)	Audubon Minnesota

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:

The Prairie Plan Science Team will distribute and implement outcomes through the existing Prairie Plan - Local Technical Teams that coordinate management actions. We will seek future funding to continue grassland bird and pollinator monitoring, add other indicators of ecosystem functioning such as water quality monitoring, and use the established database to investigate other management actions such as conservation grazing and prescribed burning.

V. TIME LINE REQUIREMENTS:

We will begin work on this project in July 2019 and complete work by July 2022.

2019 Proposal Budget Spreadsheet

Project Title: Evaluating Ecological Benefits of Prairie Plan Restorations

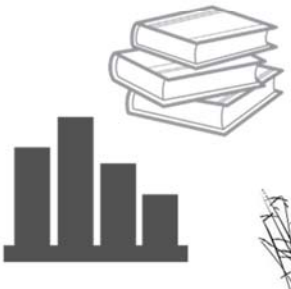
IV. TOTAL ENRTF REQUEST BUDGET 3 years

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**	
Personnel (Wages and Benefits) - Total	**$ 426,640**	
DNR Seasonal Pollinator Tech (x4) for 2 yrs @32% FTE (June - Sept): 60% salary 40% fringe.		$ 187,126
DNR Seasonal Bird Tech (x4) @8% for 2 yrs (June only): 60% salary 40% fringe.		$ 46,264
DNR Seasonal Plant Tech (x4) @17% for 2 yrs (July & August): 60% salary 40% fringe.		$ 97,578
DNR Database Mgr NR Spec (x1) for 2 yrs @50% all year: 57% salary 43% fringe.		$ 95,672
Equipment/Tools/Supplies:	**$ 3,000**	
Tools for field data collection: Insect nets ($50/field tech/season) & plant frames ($25/field tech/season).		$ 600.00
Personal Protective Equipment (sunscreen, bug spray, tick gear, headnets $100/tech/field season).		$ 2,400.00
Acquisition (Fee Title or Permanent Easements):	N/A	
Travel:	**$ 67,620**	
Pollinator crew (2 crews of 2 ppl): Total based off 4000 miles@$0.55/mi + 140 lodging nights@75/night + 140 days of meals @$36/day (meal estimate based on DNR maximum; actual costs will be reimbursed)= $17,740 for each of two years).		$ 35,480.00
Bird crew (2 crews of 2 ppl): Total based off 2000 miles@$0.55/mi + 40 lodging nights@75/night + 40 days of meals @$36/day (meal estimate based on DNR maximum; actual costs will be reimbursed)= $5,540 for each of two years).		$ 11,080.00
Plant crew (2 crews of 2 ppl): Total based off 3000 miles@$0.55/mi + 80 lodging nights@75/night + 80 days of meals @$36/day (meal estimate based on DNR maximum; actual costs will be reimbursed)= $10,530 for each of two years).		$ 21,060.00
Additional Budget Items: Direct and necessary costs cover HR Support ($8,215), Safety Support ($1,702), Financial Support ($6,377), Communication Support ($1,251), IT Support ($18,605), and Planning Support ($1,059).	**$ 37,208**	
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$	534,468

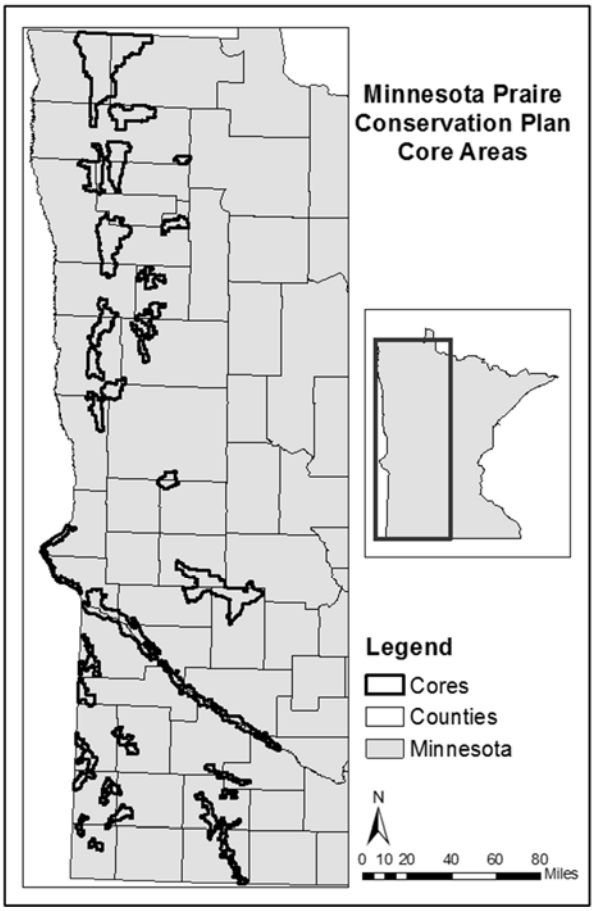
V. OTHER FUNDS *(This entire section must be filled out. Do not delete rows. Indicate "N/A" if row is not applicable.)*

SOURCE OF FUNDS	**AMOUNT**	**Status**
Other Non-State $ To Be Applied To Project During Project Period:	N/A	
Other State $ To Be Applied To Project During Project Period:	N/A	
In-kind Services To Be Applied To Project During Project Period: In-kind salary support from partners includes: Jessica Petersen - project manager & pollinator monitoring coordination ($85,500), Mike Worland - grassland bird monitoring coordination ($16,500), Kristin Hall - grassland bird monitoring coordination ($2500), Danelle Larson - database coordination ($9000), Fred Harris - plant monitoring coordination ($11,700), Daren Carlson - grassland bird monitoring coordination & database planning ($12,000), Véronique St-Louis - statistical consultation ($8400). Equipment includes: 4 iPad minis for field data entry ($3188).	$ 148,788	*Secured*
Past and Current ENRTF Appropriation:	N/A	
Other Funding History: The Prairie Plan Science Team was previously awarded a grant from the USFWS Division of Migratory Birds to test monitoring protocols and design of effectiveness monitoring for grassland birds in prairie restorations; grant ends January 31, 2019.	$ 74,202	*Secured*

Establish a Multi-agency Prairie Plan Accomplishments GIS Database + Establish Metrics of Restoration Success + Measure Indicators of Ecosystem Function



Foundation for Effectiveness Monitoring



420,000 acres of improved prairie restoration

Project Manager Qualifications and Organization Description

Project Manager: Dr. Jessica Petersen, Prairie Habitat Research Scientist
Minnesota Department of Natural Resources - Fish and Wildlife Division

Qualifications:

Jessica Petersen has been in the position of the Prairie Habitat Research Scientist for the Minnesota DNR for 1.5 years. During this time she has lead the Prairie Plan Science Team towards the goal of developing a monitoring system to assess the management actions related to the Minnesota Prairie Conservation Plan. Similarly, she has communicated current status of the sciences to the greater Prairie Plan community primarily aimed at disseminating information to the Local Technical Teams through presentations at team meetings (4), hosting a webinar series attended by 200+ people in person and with 460+ views online, and authoring two fact sheets that review the literature as it relates to prairie management. Jessica serves as a member of the Prairie Reconstruction Initiative Advisory Team and through this organization has tested plant monitoring protocols aimed at assessing establishment and persistence of prairie restorations, organized a prairie restoration field day, and convened a workshop of research scientists to discuss a research agenda for sourcing seed for prairie restorations. She has training and experience conducting scientific research in such topics as bee and butterfly community ecology, crop pollination, and prairie ecology that have resulted in 14 co-authored scientific publications, 12 invited presentations, and 14 extension and outreach publications. Dr. Petersen has taught 6 undergraduate biology courses including topics such as Geographic Information Systems (GIS), entomology, and critical thinking.

Experience:

- B.S. – University of Iowa, 2002
- M.S., Ecology and Evolutionary Biology – Iowa State University, Iowa 2003-2005
- Ph.D, Entomology, Minor – Statistics – Iowa State University, Iowa 2005-2010
- Post-doctoral Research – Cornell University, New York 2010-2014
- Adjunct Professor – Roanoke College, Virginia 2014-2016

Project Manager Responsibilities:

Jessica Petersen will continue to lead the Prairie Plan Science Team by coordinating the various partners and activities, providing accountability and transparency for the team, supervising new staff supported through this project, and managing budgets. She will be responsible for developing and implementing a work plan including achievable outcomes and tracking and reporting on project progress.

Organization Description: Minnesota DNR

The proposed project directly supports the following goals outlined by the MNDNR:

- 10-year Strategic Conservation Agenda, Goal 1, Minnesota's waters, natural lands, and diverse fish and wildlife habitats are conserved and enhanced.
- Goal 1 of Minnesota's Wildlife Action Plan: Ensure the long-term health and viability of Minnesota's wildlife, with a focus on species that are rare, declining, or vulnerable to decline.