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

Project Title: **ENRTF ID: 235-FH**

Cooperatively Improving Minnesotas Remnant Prairies through Adaptive Management

Category: H. Proposals seeking $200,000 or less in funding

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

Total Project Budget: $ 199,038

Proposed Project Time Period for the Funding Requested: June 30, 2021 (2 yrs)

Summary:

This project leverages an existing partnership of managers to improve the quality of Minnesota's native plant communities on remnant prairie, by providing cost-effective management recommendations and public access to data.

Name: Laura Dee

Sponsoring Organization: U of MN

Title: Assistant Professor

Department: Department of Fisheries, Wildlife and Conservation Biology

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St. Paul MN 55108

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Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

This project will capitalize on A) the 10-year dataset on prairies across these 90 sites in MN to improve B) our Adaptive Management process and C) its location-specific management recommendations.

_____ 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: Cooperatively Improving Minnesota's Remnant Prairies through Adaptive Management

I. PROJECT STATEMENT

Minnesota's remnant prairies are rare, and managers of the many individual remnants face increasing pressure from invasive species, uncertainty about best management practices, and limited budgets to maintain high quality prairies. The **goal of our work is to accelerate improvement in remnant prairie condition at the least cost by building upon our cooperative, multi-agency prairie management community.** We will achieve this goal by improving upon an adaptive management system (see Figure) that:

1. Leverages ongoing, standardized monitoring and assessment of remnant MN prairies across over **22,000 acres on 90 sites**, managed by U.S. Fish and Wildlife Service (USFWS), MN Department of Natural Resources (DNR) and The Nature Conservancy (TNC)
2. Leverages the **multiple partners and land managers across the state that have committed to using this approach and already contribute information to this project**.
3. Maintains a centralized, online database for managers to record assessments and management activity.
4. Performs an automated analysis that draws upon collective efforts and evaluates the cost-effectiveness of management.
5. Provides context-dependent recommendations to managers that will maximize the long-term return on investment of prairie management.

Outcomes of this project include:

- **Improved diversity and quality of native plant communities on remnant prairie across Minnesota.**
- **Improved land-management decision, using our information about best practices that have successfully improved prairies and cost-effective management options.**
- **Broader access to statewide data on the condition and diversity of remnant prairie plant communities.**

Background on the collaborative management system: Since 2008, the MN DNR, USFWS and TNC have collaboratively developed and implemented a coordinated adaptive management (AM) framework to inventory remnant prairie, evaluate the influence of management actions (prescribed fire, grazing, and rest) on invasive and native plant communities, and provide management recommendations to land managers (see Figure). The AM framework was initially established using expert opinion, but we can now use the **10 years of standardized field data from over 22,000 acres of remnant prairie to improve management recommendations and accelerate the rate of improvement for our prairies.** With improved recommendations and information to support manager decisions, such as cost-effectiveness, we anticipate land manager participation will grow.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: ***Accelerate improvement of remnant prairies through enhanced management and cost-effective recommendations for currently engaged and new land managers.***

Description: A post-doctoral researcher will assess 1) whether existing model assumptions and components effectively capture prairie response to management; 2) whether the model should include additional variables, e.g. precipitation, to improve recommendations; and 3) how to best consider the tradeoff between management costs and ecological outcomes. These analyses will ensure managers' confidence in the recommendations and aid in planning their management; for example, outputs will help managers make more informed decisions about allocating resources to improve prairie outcomes cost-effectively.

ENRTF BUDGET: $148,718

Outcome	Completion Date

1. Analysis of current model; Assessment of ecological and cost tradeoffs of management	*June 30, 2020*
2. Updated model with improved output and land manager recommendations	*June 30, 2021*

Activity 2: ***Expand participation among land managers and the availability of the data for analysis.***
Description: Currently, the data collected and analyzed from this adaptive management model is accessible only to participants of the project. This large dataset, which incorporates both an inventory of remnant prairie and how those prairies have responded to management, has value to a wide range of researchers and land managers. A database developer will improve accessibility of this valuable statewide data.
ENRTF BUDGET: $50,320

Outcome	Completion Date
1. Improved data accessibility for other natural resource uses (e.g., MN Prairie Plan).	*June 30, 2021*
2. Streamlined data input and output for long-term use and sustainability of the project.	*June 30, 2021*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Dr. Marissa Ahlering	Lead Prairie Ecologist	TNC	Assist with communication among partners and dissemination of products (Act. 1 & 2)
Dr. Laura Dee	Asst. Prof.	UMN	Co-supervise and assist post-doc with analysis and implementing the AM system (Act. 1)
TBD	Post-doc	UMN	Lead, coordinate, implement, and communicate Activity 1
TBD	Data Analyst	USFWS	Provide critical technical support for managers entering data, running the model and distributing recommendations for managers (Activity 1).

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Dr. Eric Lonsdorf	Lead Scientist	UMN	Co-supervise and assist post-doc with analysis and implementing the AM system (Act. 1)
Daren Carlson	Research Scientist II	MN DNR	Assist with coordination, communication with managers and product dissemination (Act 1 & 2)
Sara Vacek	Biologist	USFWS	Assist with coordination, communication with managers and product dissemination (Act 1 & 2)

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:
This project leverages an existing partnership dedicated to long-term adaptive management that improves and maintains high quality remnant prairie. The funding requested is a one-time need to hire a skilled post-doc and database developer to improve and streamline model outputs, which will ensure usability and accelerate improved prairie condition. The DNR, USFWS and TNC are committed to supporting this AM effort to improve native prairies, including match with time and additional project funds (Federal State Wildlife Grant Funds).
V. TIMELINE REQUIREMENTS: The proposed project will take two years to complete: July 1, 2019 - June 30, 2021.

VI. A) 2019 Proposal Budget Spreadsheet

Project Title: Cooperatively Improving Minnesota's Remnant Prairies through Adaptive Management

IV. TOTAL ENRTF REQUEST BUDGET 2 years

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel:	
Postdoctoral researcher (TBD) $121,400 (1.0 FTE, 82.37% salary & 17.63% benefits, 2 years) will lead and implement activity 1 and coordinate activity 1	$ 121,400
P.I. Salary (Dee) $16,498 (5% FTE yr1 & 8% FTE in yr2, 75% salary & 25% benefits) will co-supervise the post-doc and assist with activity 1, and co-coordinate the group	$ 16,498
Professional/Technical/Service Contracts: Database developer. Developer will improve and enhance the accessibility of the statewide remnant prairie data (Activity 2)	$ 25,000
Equipment/Tools/Supplies: Computer for the post-doc as this is a computer based project for analyzing and making data accessible to land managers (needed to support Activity 1 & 2)	$ 3,000
Travel: Travel for the post-doc to field cooperators in the field within the state. This will enhance the role of the post-doctoral researcher in coordinating and facilitating this new system of collaboration, management, and monitoring, and communication across the partners	$ 2,500
Additional Budget Items:	
Subaward to The Nature Conservancy: Prairie Ecologist (Ahlering; 0.05 FTE plus fringe, 2 years) will co-coordinate the collaboration and data collection and analysis for activities 1 and 2	$ 10,640
Subaward to the U.S. Fish and Wildlife Service: Data Analyst (TBD) $20,000 (0.11 FTE, 2 years) will implement activity 2.	$ 20,000
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 199,038

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: Federal funds to cover FWS staff time for project related activities over 2 years This related staff time is not being considered mandatory committeed match by UMN. UMN will not be reporting on this time.	$ 28,906	*Secured*
Other State $ To Be Applied To Project During Project Period: DNR staff time contributing to project activities over 2 years. This related staff time is not to be considered mandatory committeed match by UMN. UMN will not be reporting on this time.	$ 12,000	*Secured*
In-kind Services To Be Applied To Project During Project Period: The Institute on the Environment will contribute $20,000 (8% of Lonsdorf's FTE per year, which is 67% salary and 33% fringe) to support Lonsdorf to co-advise the post-doc and join meetings. The University of Minnesota (Fisheries, Wildlife, and Conservation Biology) will contribute/match Dee's time for year one (0.05 FTE) at $5,407 (with .337% fringe benefits) The University of Minnesota's Facilities and Administrative rate is 54% of modified total direct costs (total direct less graduate student fringe, capital equipment, each subawards over $25,000 and on-site facilities rental). Unrecovered F&A $107,480. The University will provide office space, IT services, and administrative / financial services in support of the project.	$ 132,887	*Secured*
Past and Current ENRTF Appropriation:	NA	NA
Other Funding History:	NA	*NA*

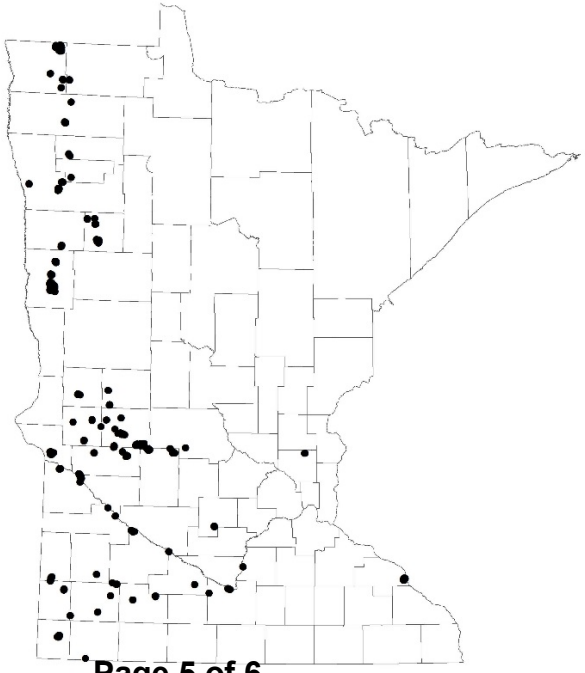
Cooperatively Improving Minnesota's Remnant Prairie through Adaptive Management

P.I.s, Laura Dee & Eric Lonsdorf

University of Minnesota · Department of Natural Resources · U.S. Fish & Wildlife Service · The Nature Conservancy — Protecting nature. Preserving life.™

The goal of this project is to capitalize on **A)** the 10-year dataset on prairie condition from across the state to **B)** improve the Model component of the Adaptive Management cycle so that the **C)** current management recommendations for managers can be improved to include a suite of options along with the ecological and financial tradeoffs. **This will result in more informed decisions and improved prairie condition across Minnesota.**

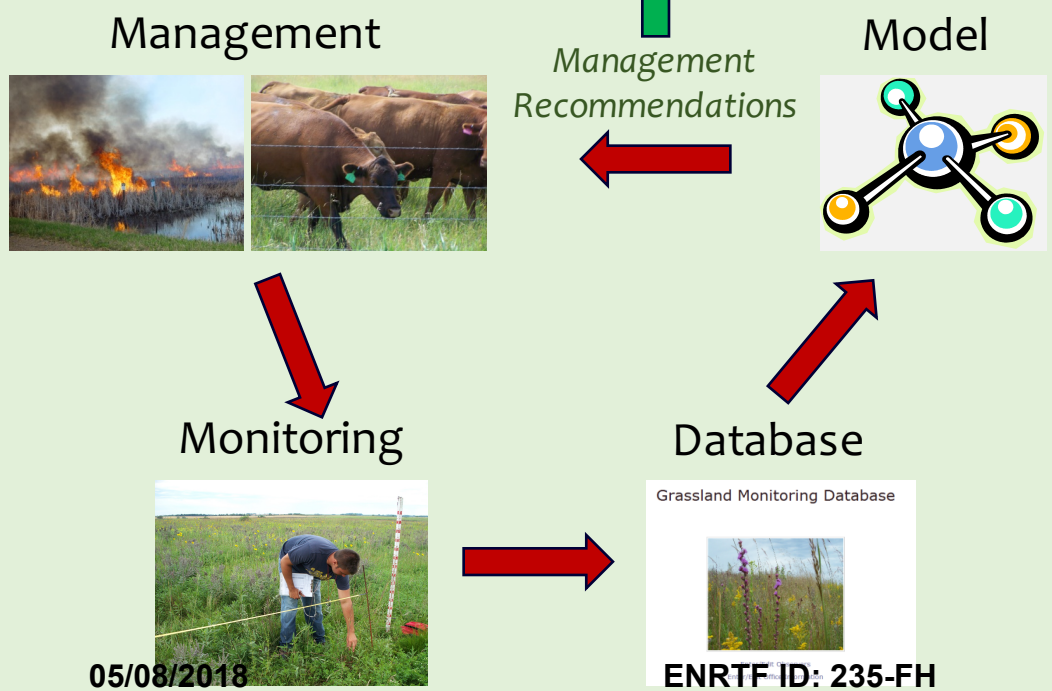
A) All Prairie Monitoring Locations



C) Actual Management Recommendations for four management units in the project. The table includes past management and future management recommendations (2018-2020) based on the current condition of the units (R = Rest; B = Burn, G = Graze).

Management Unit	Start Year	Previous Action Taken	End Year	Recommended Action 2018-2020
Leif Mountain Unit 1	2014	BRB	2017	BRR
Regal Meadow Unit 2	2014	GGG	2017	GRR
Roscoe Southeast	2014	BRR	2017	BRR
Schaefer Southeast	2014	BRR	2017	RRR

B) Adaptive Management Cycle



05/08/2018

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VI. F. Project Manager Qualifications and Organization

Eric V. Lonsdorf, co-Project Manager
Lead Scientist
Inst. on the Environment
University of Minnesota
Lons0011@umn.edu

Laura Dee, co-Project Manager
Assistant Professor
Dept. of Fisheries, Wildlife, and Conservation Biology
University of Minnesota
ledee@umn.edu

Organization Description:

The University of Minnesota is the state's primary research university and a land-grant university with a strong commitment to public service and education. At UMN, Eric is a lead scientist at the Institute on the Environment. Laura is affiliated with the Department of Fisheries, Wildlife, and Conservation Biology and the Institute on the Environment. Both departments aim to solve pressing environmental challenges through impactful research, local to global partnerships, and training of the next generation of leaders. At the University of Minnesota, the Institute on the Environment coordinates and accelerates translational research through discovery programs like the Natural Capital Project, and through a network of faculty and researchers across departments and colleges.

Lonsdorf – Recent Awards and Grants

- Foundation for Food and Agriculture Research (co-PI with Christina Grozinger) – Developing resources and tools for selecting and managing landscapes to promote healthy bee populations. $200,000 to U-Minnesota. (4/1/2018 – 3/30/2023)
- USDA – AFRI (co-PI with Dan Cariveau) – Ecology and economics of pollinator habitat: Using a landscape-scale experiment to determine cost-effective restoration strategies for beneficial insects. $999,803. (7/1/2018 – 6/30/2022)

Lonsdorf – Relevant Publications

- Williams, N. M., and **E. V. Lonsdorf**. 2018. Selecting cost-effective plant mixes to support pollinators. Biological Conservation 217:195–202.
- Hunt, V. M., J. B. Fant, L. Steger, P. E. Hartzog, **E. V. Lonsdorf**, S. K. Jacobi, and D. J. Larkin. 2017. PhragNet: crowdsourcing to investigate ecology and management of invasive *Phragmites australis* (common reed) in North America. Wetlands Ecology and Management: 1–12.
- Koh, I., **E. V. Lonsdorf**, et al. 2016. Modeling the status, trends, and impacts of wild bee abundance in the United States. *Proceedings of the National Academy of Sciences* 113: 140-145.
- Drum, R. G., C. A. Ribic, K. Koch, **E. V. Lonsdorf**, E. Grant, **M. Ahlering**, et al 2015. Strategic grassland bird conservation throughout the annual cycle: linking policy alternatives, landowner decisions, and biological population outcomes. PloS One 10: e0142525.

Dee – Recent Awards and Grants

- Innovations in Sustainability Science Award, Ecological Society of America (2018)
- MAISRC, "Building scientific and management capacity to respond to invasive Phragmites in Minnesota," co-PI with D. Larkin (PI) and S. Galatowitsch, 2017-19 $246,800
- NSF Long-Term Ecology Research Synthesis Grant, NCEAS, *"Scaling-Up Productivity Responses to Changes in Biodiversity"* co-PI with F. Isbell and J. Cowles, 2017-19, $100,000

Dee - Relevant Publications

- Isbell, F., Cowles, J., **Dee, L.E.,** et al. Quantifying effects of biodiversity on ecosystem functioning across times and places. In Press. *Ecology Letters*.
- **Dee, L.E.,** De Lara, M., Costello, C., Gaines, S.D. (2017) To what extent do ecosystem services motivate protecting biodiversity? *Ecology Letters* 20: 935-946.
- **Dee, L.E.,** et al (2017) Operationalizing network theory for ecosystem service assessments. *Trends in Ecology & Evolution* 32(2): 118-130.
- **Dee, L.E.** & Gerber, L. (2012) Applications of Decision Theory to Conservation Planning and Management. Nature Education Knowledge 3(3):11.