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

Project Title: **ENRTF ID: 021-A**

Grasslands, Grazing, and Greater Prairie-chickens: Testing Trade-offs

Category: A. Foundational Natural Resource Data and Information

Sub-Category:

Total Project Budget: $ 392,065

Proposed Project Time Period for the Funding Requested: June 30, 2024 (5 yrs)

Summary:

Our study will determine whether grazing to meet conservation objectives has trade-offs for ground-nesting birds, like Greater Prairie-chickens, that should be considered in planning and implementation.

Name: Charlotte Roy

Sponsoring Organization: MN DNR

Title: Research Scientist

Department:

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Location

Region: Central, Northwest, Southwest, Southeast

County Name: Becker, Blue Earth, Clay, Cottonwood, Dodge, Douglas, Fillmore, Freeborn, Goodhue, Grant, Houston, Jackson, Kittson, Lac qui Parle, Lincoln, Lyon, Mahnomen, Marshall, Martin, Murray, Nicollet, Nobles, Norman, Olmsted, Otter Tail, Pennington, Pipestone, Po

City / Township:

Alternate Text for Visual:

The visual consists of a photo of cattle resting by a stream, a greater prairie-chicken which needs large grasslands, and a raptor perched on a fence post.

_____ 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: Grasslands, Grazing, and Greater Prairie-chickens: Testing Trade-offs

I. PROJECT STATEMENT

Our study will determine whether grazing to meet conservation objectives has trade-offs for ground-nesting birds, like Greater Prairie-chickens, that should be considered in planning and implementation. The 2017 Minnesota Prairie Conservation Plan identifies conservation grazing as a key prairie management tool based on positive outcomes in large, western landscapes. However, these studies may not apply to more fragmented Minnesota landscapes where nearby, ungrazed areas to support offspring production may be limited or absent.

We propose to examine the impacts of site size and timing of grazing to identify grazing scenarios that produce favorable outcomes for Greater Prairie-chickens and other ground nesting birds like waterfowl. Greater Prairie-chickens rely on large, intact grasslands and are considered a good indicator species for other grassland-dependent species. We will examine habitat use, nest survival, and brood survival before, during, and after grazing in pastures grazed at different times (May-Jun and Jul-Aug) and at ungrazed pastures at the same sites.

We hypothesize that grazing smaller, fenced pastures:
- Will intensify cattle activity around fences and create trails for nest and brood predators.
- Will provide perch sites for predators on fence posts.
- Will constitute a reduction in habitat while cattle are present, if hens avoid pastures with cattle.
- Will delay nest initiation, reduce nest success, and reduce brood survival.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: *Determine if cattle and fencing reduce nest success of Greater Prairie-chickens and other ground-nesting birds like waterfowl.*
We will find nests, measure vegetation at nests, and identify causes of nest failure.
ENRTF BUDGET: $256,333

Outcome	Completion Date
1. Nest locations & nest site characteristics of Greater Prairie-chickens & other birds	31 Jul 2022
2. Nest fates relative to grazing treatments (early, late, or not grazed) and fencing	31 Jul 2022
3. Complete data analysis and make recommendations	31 Jul 2023

Activity 2: *Determine if Greater Prairie-chicken broods have lower survival in grazed pastures or if hens avoid pastures with cattle compared to ungrazed pastures.*
We will trap 30 hens/year and attach 15 GPS transmitters and 15 non-GPS transmitters to monitor hen and brood habitat use, movements, and survival relative to 15 marked cattle in grazed pastures. We will compare data for grazed and ungrazed pastures.
ENRTF BUDGET: $70,732

Outcome	Completion Date
1. 30 Greater Prairie-chicken hens marked per year to obtain hen and brood locations	31 Jul 2022
2. Habitat use and survival of broods in grazed and ungrazed pastures	31 Aug 2022
3. Complete data analysis and make recommendations	31 Aug 2023

Activity 3: *Determine whether predators use fences as perch sites and travel corridors.*
We will place 45 trail cameras (1 camera/pasture at 10-15 sites divided into 3 pastures) to view predators that use fence lines as travel corridors or perch on fence posts. Cameras will be moved periodically to capture different perspectives within pastures.

ENRTF BUDGET: $65,000

Outcome	Completion Date
1. Trail cameras (45) placed to photograph predators associated with fences & pastures	31 Aug 2022
2. Predators identified in photos and associated with infrastructure and site attributes	31 Jun 2023
3. Complete data analysis and make recommendations	31 Aug 2023

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Dr. Joseph Knight	Director & Associate Professor	UM-Twin Cities	Advise graduate students
Daniel Heins	Research Fellow, UAS Coordinator	UM-Twin Cities	Pilot & spatial analysis

B. Partners NOT receiving ENRTF funding

Name	Title	Affiliation	Role
Brian Winter	President	MN Prairie Chicken Society	Review grazing sites
Matt Mecklenberg, Travis Issendorf	Biologists	The Nature Conservancy	Identify grazing sites
Rebecca Esser, Darren Wheeling	Biologists	U.S. Fish & Wildlife Service	Identify grazing sites

IV. LONG-TERM- IMPLEMENTATION AND FUNDING: This research will help identify pasture sizes and the timing of grazing that will produce the most favorable outcomes for Greater Prairie-chickens and other ground-nesting birds like waterfowl. Better information will help land managers reach wildlife habitat and population goals and will help guide investment of infrastructure (fence and water source installation).

V. TIME LINE REQUIREMENTS: We will collect field data for 3 years (spring/summer 2020, 2021, and 2022) at 10-15 sites divided into 3 pastures/site in western Minnesota. We will compare grazing treatments in 2021 to pre- and post-grazing data in 2020 and 2022, respectively. During the grazing year, we will sample pastures grazed during May-Jun to capture the nesting period, pastures grazed during July-Aug to capture brood-rearing, and pastures that have not been grazed to serve as controls. In 2023, we will analyze data and make recommendations for conservation grazing that will benefit grassland birds.

VI. SEE ADDITIONAL PROPOSAL COMPONENTS:

A. Proposal Budget Spreadsheet
B. Visual Component or Map
C. Project Manager Qualifications and Organization Description
D. Letters of Support

2019 Proposal Budget Spreadsheet

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IV. TOTAL ENRTF REQUEST BUDGET *[4]* **years of funding with report completion in the 5th year**

BUDGET ITEM	AMOUNT
Professional Service contracts (UMN): 2 Graduate students (3 years of support at 25%); 2 seasonal technicians for 2.5 months in 2020, 2.5 months in 2021, and 2.5 months in 2022; Dan Hein's time (25% effort*3 years= $51,000); drone flights per site at 10-15 sites and processing; 2 drones (@$19,000 each+ $7,000 maintenance), software ($3000)	$ 267,930
Equipment/Tools/Supplies: GPS satellite transmitters (25 collars@$1,700 each), GPS satellite collars for 5 cows (5@1,500 each), data download accessories ($3,680); temporary fencing to split pastures into experimental units $4,403; 10 trail cameras @$200 each; non-GPS transmitters (70@$200 each) to increase sample size of marked hens for both nest survival and brood survival, movements, and habitat use	$ 74,083
Acquisition (Fee Title or Permanent Easements):	NA
Travel: Fleet and field lodging (for 4 people for 2.5 months @$2000/mo. and for 2 people for 2 months @ $1000/mo. at a field site in western MN away from St Paul campus); 21 mos of truck use @ $1200/mo./truck	$ 46,200
Additional Budget Items: DNR Direct and Necessary: People Support ($0), Safety Support ($0), Financial Support ($1,542), Communication Support ($1,251), IT Support ($0), and Planning Support ($1,059).	$ 3,852
TOTAL	$ 392,065

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period: The Nature Conservancy, U.S. Fish and Wildlife Service, and MN DNR will provide permanent fencing at sites to be used in this study.	TBD	*Pending*
Other State $ To Be Applied To Project During Project Period: 54% indirect rate at UM	$ 144,682	*Secured*
In-kind Services To Be Applied To Project During Project Period: Each institution will provide 10% T/E + fringe for the 4 year duration of the project. Charlotte Roy (DNR: $40,000); Joe Knight (UM: $36,900); 10 GPS cow collars @$1500/collar (DNR); 35 trail cameras @$200/camera (DNR); DNR supplies, computers, software, GPS ($5,000); UM computers and software ($32,000)	$ 135,900	*Secured*
Past and Current ENRTF Appropriation: This project has not received any prior funding.	NA	
Other Funding History: This project has not received any prior funding.	NA	

Is Cattle Grazing Good for Grassland Birds?

Cattle grazing can prevent woody encroachment and help maintain grasslands

Fencing can alter predator behavior- will this impact ground nesting birds?

Prairie chickens need large grasslands which are in short supply but likely to be grazed

Project Manager Qualifications and Organization Description

Charlotte Roy has been a Research Scientist with the Minnesota Department of Natural Resources Section of Wildlife for 10 years. During that time, she has developed and led a dozen research studies to inform the management of natural resources in Minnesota, with an emphasis on grouse, waterfowl, and their habitats. Her career experience is broader than gamebirds, spanning 20 years and including predators such as raccoons, invasive species like faucet snails, and state threatened and endangered species including peregrine falcons and swamp rabbits (in Indiana). She also enjoys working at multiple scales ranging from landscapes to molecules with experience and publications in landscape ecology, community ecology, population ecology, physiology, and genetics. These diverse interests help her connect and communicate with diverse groups from school age children to hunters, recreational boaters, citizen scientists, academics, and land managers. Her career goal is to provide scientific information that can improve the management of natural resources in a way that benefits future generations and to communicate that information in a way that resonates with non-consumptive nature lovers, utilitarian resource users, urbanites, and those that prefer staying indoors but still enjoy clean drinking water. The research in this proposal is one step towards that goal.

Organizational Description

The mission of the Minnesota Department of Natural Resources (DNR) is to "*work with citizens to conserve and manage the state's natural resources, to provide outdoor recreation opportunities, and to provide for commercial uses of natural resources in a way that creates a sustainable quality of life*." Our research supports understanding how to sustainably graze Minnesota's prairies to enhance wildlife habitat while providing revenue for cattle ranchers. Conservation grazing may improve Minnesota's wetland habitats and provide quality recreation for waterfowl hunters and bird watchers. The MNDNR Wildlife Research Group Leaders have reviewed our research proposal for scientific merit and its ability to upkeep the agency's mission.