

**Environment and Natural Resources Trust Fund  
2020 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 024-A**

Impacts of Conservation Grazing on Greater Prairie-chickens

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**Category:** A. Foundational Natural Resource Data and Information

**Sub-Category:**

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**Total Project Budget: \$** 560,044

**Proposed Project Time Period for the Funding Requested:** June 30, 2024 (4 yrs)

**Summary:**

Our study will determine whether grazing to meet conservation objectives has trade-offs for ground-nesting birds like Greater Prairie-chickens, a Species of Special Concern, that should be considered and mitigated.

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**Name:** Charlotte Roy

**Sponsoring Organization:** MN DNR

**Job Title:** Dr.

**Department:** Wildlife

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Grand Rapids MN 55744

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**Location:**

**Region:** Northwest

**County Name:** Clay, Norman, Otter Tail, Pennington, Polk, Red Lake, Wilkin

**City / Township:**

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**Alternate Text for Visual:**

The visual depicts cattle resting by a stream a raptor perched on a fence post, and a Greater Prairie-chicken displaying in a grassland.

_____ Funding Priorities	_____ Multiple Benefits	_____ Outcomes	_____ Knowledge Base
_____ Extent of Impact	_____ Innovation	_____ Scientific/Tech Basis	_____ Urgency
_____ Capacity Readiness	_____ Leverage	_____ TOTAL	_____ %



**PROJECT TITLE:** Impacts of Conservation Grazing on Greater Prairie-chickens

**I. PROJECT STATEMENT**

Conservation grazing is a prairie management tool developed in western landscapes, but applying this tool in Minnesota where <1% of prairie remains may produce different outcomes than out west where large, continuous grasslands still exist and nearby, ungrazed areas are in abundant supply for breeding birds. The limited prairie that does remain needs to be managed with the needs of sensitive wildlife in mind. This study will provide much needed information to understand those needs and communicate them to public land managers and conservation organizations working with private landowners. Our study will determine whether grazing to meet conservation objectives has trade-offs for ground-nesting birds, like Greater Prairie-chickens, and if so how best to mitigate any negative trade-offs via planning and implementation. This information will help meet the ENRTF mission to protect, conserve, preserve, and enhance natural resources in Minnesota.

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, a Species of Special Concern, 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 will investigate whether grazing smaller, fenced pastures in a landscape surrounded by row-crop agriculture:

- Could intensify cattle activity around fences and create trails for predators of nests and broods.
- Could provide perch sites for raptors on fence posts in landscapes otherwise lacking trees.
- Could reduce habitat while cattle are present, if hens avoid pastures with cattle.
- Could delay nest initiation, reduce nest success, and reduce brood survival.

By addressing these questions, we will gain important insights to inform grazing plans and their implementation so that any unintended consequences to ground-nesting birds are avoided and mitigated.

**II. PROJECT ACTIVITIES AND OUTCOMES**

**Activity 1:** *Determine if cattle and fencing impact 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: \$316,871**

Outcome	Completion Date
1. Nest locations (<100/year) & 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 to public land managers and conservation organizations working with private landowners	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 100 hens/year and attach 50 GPS transmitters and 50 non-GPS (VHF) transmitters to monitor hen and brood habitat use, movements, and survival relative to 12 marked cattle in grazed pastures. We will compare data for grazed and ungrazed pastures.

**ENRTF BUDGET: \$204,839**



**Environment and Natural Resources Trust Fund (ENRTF)**

**2020 Proposal**

**Project Title:** Impacts of Conservation Grazing on Greater Prairie-chickens

<b>Outcome</b>	<b>Completion Date</b>
1. 100 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 in relation to cattle	31 Aug 2022
3. Complete data analysis and make recommendations to public land managers and conservation organizations working with private landowners	31 Aug 2023

**Activity 3:** *Determine whether predators use fences as perch sites and travel corridors.*

We will place 36 trail cameras (1 camera/pasture at 12 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: \$38,334**

<b>Outcome</b>	<b>Completion Date</b>
1. Trail cameras (36) 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 to public land managers and conservation organizations working with private landowners	31 Aug 2023

**III. PROJECT PARTNERS:**

**A. Partners receiving ENRTF funding**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Role</b>
Dr. Joseph Knight	Director & Associate Professor	UM Twin Cities	Oversee spatial analysis
Daniel Heins	Research Fellow, UAS Coordinator	UM Twin Cities	Pilot & Spatial analysis

**B. Partners NOT receiving ENRTF funding**

<b>Name</b>	<b>Title</b>	<b>Affiliation</b>	<b>Role</b>
Brian Winter	President	MN Prairie Chicken Society	Review sites
M. Mecklenberg, T. Issendorf	Biologists	The Nature Conservancy	Identify 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). We will share findings and recommendations to public land managers and conservation organizations working with private landowners (e.g., MNDNR, The Nature Conservancy, US Fish and Wildlife Service, Natural Resources Conservation Service).

**V. TIME LINE REQUIREMENTS:** We will collect field data for 3 years (spring/summer 2020, 2021, and 2022) at 12 sites divided into 3 pastures/site in western Minnesota (Clay, Polk, Becker, Wilkin, Mahnomen, Otter Tail, Norman counties). We will compare grazing treatments in 2021 to pre- and post-grazing data in 2020 (initial year pending funding from MN DNR Wildlife Research) and 2022, respectively. During the grazing year, we will sample pastures grazed during May-Jun to sample during the nesting period, pastures grazed during July-Aug to sample during 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 ground nesting 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**

Attachment A: Project Budget Spreadsheet  
 Environment and Natural Resources Trust Fund  
 M.L. 2020 Budget Spreadsheet



Legal Citation: NA  
 Project Manager: Charlotte Roy  
 Project Title: Impacts of Conservation Grazing on Greater Prairie-chickens  
 Organization: Minnesota Department of Natural Resources  
 Project Budget: \$560,044  
 Project Length and Completion Date: 3 years of funding with report completion in the 4th year  
 Today's Date: 4/12/19

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance	
<b>BUDGET ITEM</b>				
<b>Personnel (Wages and Benefits)</b>	\$ -	\$ -	\$ -	
1 graduate student (2.5 years@\$46,000/yr, with 54% salary, 46% health and tuition )	\$ 115,000			
1 seasonal technician for 5 mos. (0.42 FTE) in 2 years @\$2682/mo. (87% salary, 13% fringe) in 2021 and 2022 (trap, track, nest and brood monitoring, veg measurements)	\$ 26,820			
2 seasonal technicians for 2 mos. (0.16 FTE) in 1 year @\$2682/mo. (87% salary, 13% fringe) in 2020 (brood monitoring, veg measurements)	\$ 10,728			
4 seasonal technicians for 2 mos. (0.16 FTE) in 2 years @\$2682/mo. (87% salary, 13% fringe)with 13% fringe in 2021 and 2022 (trap, track hens)	\$ 42,912			
<b>Professional/Technical/Service Contracts</b>				
Contract with Remote Sensing and Geospatial Analysis Lab (RSGAL) for thermal infrared image acquisition and processing to find nests (25% effort*2 years)- single source contract due to unique capabilities of RSGAL	\$ 36,850	\$ -	\$ 36,850	
Contract with ARGOS for acquisition of data from transmitters- single source contract (\$3,000 per year for 2.6 years)	\$ 7,800			
<b>Equipment/Tools/Supplies</b>				
Solar-powered GPS satellite transmitters (50 collars @\$3,950 each)	\$ 197,500			
VHF (non-GPS) transmitters (100 @\$200 each) to increase sample size of marked hens to 100 in 2021 and 2022 so that brood numbers are sufficient after accounting for failed nests	\$ 20,000			
12 cow collars (1 per site for 12 sites @\$1500 each)	\$ 18,000			
<b>Capital Expenditures Over \$5,000</b>				
Thermal sensor (\$22,000) and maintenance (\$6,000) to find nests using thermal infrared	\$ 28,000	\$ -	\$ 28,000	
<b>Travel expenses in Minnesota</b>				
Fleet 20 mos. of truck use @\$1400/mo./truck (3 trucks for 4 mos. and 1 truck for 8 mos.) with additional mileage included as per Commissioner's policy	\$ 28,000			
Lodging for graduate student and 5 technicians for 4 mos. @ \$2000/mo. and for 3 people for 8 mos. @ \$1000/mo. at a field site in northwestern MN (Clay, Polk, Norman, Otter Tail, Wilkin, Becker, Mahnommen counties) as per Commissioner's policy	\$ 16,000			
Travel for RSGAL drone pilot to study sites to acquire thermal infrared imagery (\$1,800 for lodging, \$4,640 for mileage) as per UMN policy	\$ 6,440	\$ -	\$ 6,440	
<b>Other</b>				
DNR Direct and Necessary: People support (\$0), Safety support (\$0), Financial support (\$3,453), Communication support (\$1,251), IT Support (\$0), and Planning Support (\$1,059)	5994	\$ -	\$ -	
<b>COLUMN TOTAL</b>	\$ 560,044	\$ -	\$ 71,290	
<b>SOURCE AND USE OF OTHER FUNDS CONTRIBUTED TO THE PROJECT</b>				
	<b>Status (secured or pending)</b>	<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
<b>Non-State:</b>				
The Nature Conservancy and MNDNR will provide permanent fencing at sites to be used in this study		TBD	\$ -	#VALUE!
<b>State:</b>				
DNR Wildlife Research is recommending support of initial data collection for the project for consideration in the upcoming FY20 Budget Setting Meeting		\$ 81,548		
<b>In kind:</b>				
Each institution will provide 10% T/E + fringe for the 3 year duration of the project. Charlotte Roy (MNDNR: \$30,000), Joe Knight (UM: \$36,900)		\$ 66,900		
36 trail cameras @\$200/camera (MNDNR)		\$ 7,200		
54% unrecovered indirect costs at UM		\$ 144,045		
UM computers and software at RSGAL		\$ 32,000		
DNR supplies, computers, software, GPS(\$5,000)		\$ 5,000		
<b>Other ENRTF APPROPRIATIONS AWARDED IN THE LAST SIX YEARS</b>				
	<b>Amount legally obligated but not yet spent</b>	<b>Budget</b>	<b>Spent</b>	<b>Balance</b>
<b>This project has not received any prior funding.</b>				
		\$ -	\$ -	\$ -



## Is Cattle Grazing Good for Grassland Birds?



Cattle grazing can prevent woody encroachment and help maintain grasslands

### Outcome:

- Results and recommendations will be shared with public land managers and conservation agencies that work with private landowners (e.g., DNR, The Nature Conservancy, US Fish and Wildlife Service, Natural Resources Conservation Service) to inform prairie management to meet the needs of sensitive wildlife



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



Greater Prairie-chickens, a Species of Special Concern, 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.