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

Project Title: **ENRTF ID: 016-A**

Spruce Grouse: Sentinels for Boreal Forest Connectivity

Category: A. Foundational Natural Resource Data and Information

Sub-Category:

Total Project Budget: $ 361,630

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

Summary:

Our primary objective is to understand how to harvest timber in the boreal forest in a way that enables species with limited movements to thrive in a changing landscape.

Name: Julia Ponder

Sponsoring Organization: U of MN

Title: Executive Director

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Location

Region: Northwest, Northeast

County Name: Beltrami, Cass, Clearwater, Cook, Crow Wing, Hubbard, Itasca, Koochiching, Lake, Lake of the Woods, St. Louis

City / Township:

Alternate Text for Visual:

Spruce grouse, timber harvesting and location of boreal forests in Minnesota

_____ 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: Spruce Grouse: Sentinels for Boreal Forest Connectivity

I. PROJECT STATEMENT

Our primary objective is to study how the composition, arrangement, and size of boreal forest stands influence wildlife movement to allow incorporation of wildlife needs in forest planning. Five scientific models predict that the spruce-fir forest will shift entirely north of the US border with warmer summers and drought. As these shifts occur, maintaining habitat patches close enough to each other to allow wildlife to move successfully between patches will be important to:

- Maintain sustainable populations
- Allow colonization of new areas in a changing landscape

The recently completed Sustainable Timber Harvest Analysis conducted under the Governor Dayton's direction will result in the harvest of 870,000 cords with 30,000 additional cords of ash and tamarack on lands managed by the Department of Natural Resources for the next 10 years. Our study will provide data on how close forest patches of similar composition should be to each other to accommodate even the most short-ranging wildlife.

Spruce grouse prefer black spruce, jack pine, and tamarack stands with pilot data from Northwest Minnesota indicating that they use <200 acres year round, although they are capable of moving farther. Thus, spruce grouse may serve as a sentinel of connectivity deficiencies among stands and creation of forest islands. We propose to use spruce grouse as a sentinel species for other boreal species at both local and landscape scales.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1*: Study wildlife use of forest stands through fecal pellet surveys*
We will conduct ≥125 surveys collecting fecal pellets in conifer stands throughout northern Minnesota during winter when they contrast well against the snow. We will examine forest characteristics at the stand level in the field and at a large scale using GIS mapping software. We will use these data to understand how wildlife use and move between forest stands that vary in size, composition, and arrangement.
ENRTF BUDGET: $95,997

Outcome	Completion Date
1. Fecal pellet surveys (125) along transects in conifer stands during winter	*April 2020*
2. Determine how wildlife use and move among forest stands and how this is related to stand characteristics and isolation	*June 2021*
3. Make recommendations for forest planning to promote landscapes that wildlife can access after harvest or habitat loss	*December 2021*

Activity 2*: Study spruce grouse movements after harvest of stands where they were captured*
We will capture 70 spruce grouse and attach transmitters so that we can monitor movements before, during, and after timber harvest. We will determine if spruce grouse move to the nearest conifer forest stand, or farther, and whether there is substantial mortality risk of moving in an unfamiliar landscape.
ENRTF BUDGET: $173,507

Outcome	Completion Date
1. Capture spruce grouse (70) in stands planned for harvest and attach transmitters	*April 2021*

2. Monitor spruce grouse movements following timber harvest	*April 2022*
3. Recommend configuration of stands to optimize wildlife response to timber harvest	*December 2022*

Activity 3: *Examine large scale connectivity of the forest using genetics of spruce grouse*
We will collect >300 spruce grouse pellets in the winter to obtain DNA to perform a landscape-level analysis of forest connections in the boreal forest region of Minnesota. Genetics allow the identification of long-term barriers to movement at a regional scale, and genetic structure quickly dissipates when corridors for movement are provided.
ENRTF BUDGET: $92,126

Outcome	Completion Date
1. Collect spruce grouse fecal pellets (300) during winter	*April 2020*
2. Laboratory analysis of spruce grouse genetic samples	*December 2020*
3. Landscape analysis of genetic samples to examine large scale connections in the forest	*June 2021*

III. PROJECT PARTNERS:

A. Partners receiving ENRTF funding

Name	Title	Affiliation	Role
Charlotte Roy	Research Scientist	MNDNR	Oversee field studies

B. Partners NOT receiving ENRTF funding: NA

Name	Title	Affiliation	Role
Various staff	Foresters, Wildlife Managers	MNDNR	Identify timber stands for inclusion in study

IV. LONG-TERM- IMPLEMENTATION AND FUNDING:
This research will provide information to improve timber harvest planning in ways that are compatible with conservation of wildlife populations. We currently lack information to manage wildlife strategically with changing forest composition and predicted loss of spruce-fir forests from Minnesota. This study will reduce that information gap.

V. TIME LINE REQUIREMENTS:
This study will require 2 years of field data collection and 1 year for lab work and landscape analyses. We will survey forest stands for pellets in the winter of 2019-2020. We will conduct lab analysis in spring and summer 2020. We will catch spruce grouse during winters of 2019 and 2020, and springs of 2020 and 2021 to examine movements before, during, and after harvest of stands (e.g., black spruce in winter, jack pine in summer). We will perform data analysis in winter and spring 2021 and 2022, with recommendations by December 2022.

VI. SEE ADDITIONAL PROPOSAL COMPONENTS:

A. Proposal Budget Spreadsheet
B. Visual Component or Map
E. Research Addendum (not required at proposal stage)
F. Project Manager Qualifications and Organization Description
G. Letter or Resolution

2019 Proposal Budget Spreadsheet

Project Title: Spruce Grouse: Sentinels for Boreal Forest Connectivity

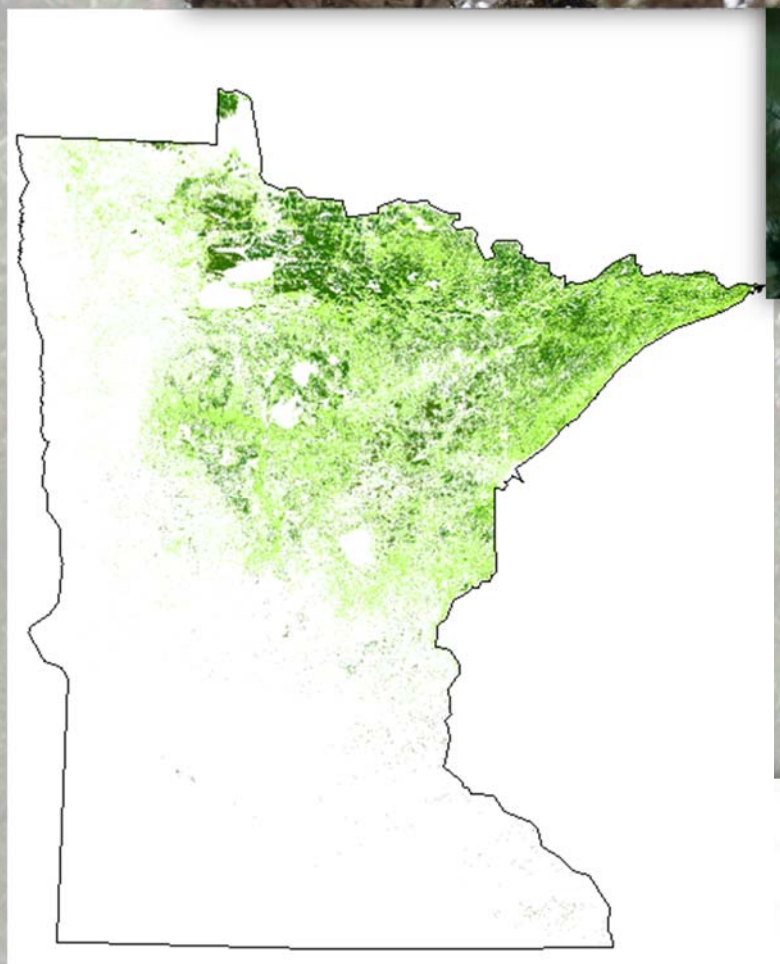
IV. TOTAL ENRTF REQUEST BUDGET *[3]* **years**

BUDGET ITEM (See "Guidance on Allowable Expenses")	**AMOUNT**
Personnel: Project management (J Ponder) 5% effort (75% salary, 25% fringe) for 2 years; UM postdoc @24 months*$5000/mo. plus 22.4% fringe;	164,316
Professional/Technical/Service Contracts: DNR for support with field data collection (3 field technicians @$2782/mo. for 14 total mos. ($38,947); 2 trucks for 10 mos @$1500/mo for telemetry crew ($15,000); Lodging and per diem for crew of 4 to survey throughout northern MN for 150 days ($19,448); 4 Flights to find any lost birds @$1,000 per flight ($4,000); Direct and necessary costs ($9,287)	$ 86,682
Professional/Technical/Service Contracts: UMN Genomics Center sequencing costs: 500 samples, $44.88 per sample	22,440
Equipment/Tools/Supplies: Supplies to collect samples ($15,462); 30 GPS transmitters @$1350 each ($40,500); 40 VHF transmitters @$200 each for cold tolerance ($8000); tracking equipment ($7,680); misc supplies ($3,500)	$ 75,142
Travel: Lodging and per diem for post doc while doing field work in northern Minnesota. Vehicle lease or rent @$1500/mo for 4 mos. for pellet survey crew (will use most cost effective option per university reimbursement policy)	$ 13,050
Additional Budget Items:	$ -
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 361,630.00

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: Timber harvest on county lands will be conducted by counties with existing funds and equipment	TBD	*Secured*
Other State $ To Be Applied To Project During Project Period: UM indirect costs at 54%	$ 195,280	*Secured*
In-kind Services To Be Applied To Project During Project Period: Matching funds for Charlotte Roy (MDNR, 0.10 FTE*2.5 years= $10,000)	$ 25,000	*Secured*
Past and Current ENRTF Appropriation: No previous funding	NA	
Other Funding History: NA	NA	

Spruce Grouse: Sentinels for Boreal Forest Connectivity



Minnesota's boreal forest.
Aspen/birch (light green), conifers (dark green)

Timber harvest in boreal forest

Project Manager Qualifications and Organizational Description

Dr. Julia Ponder, Principal Investigator. Dr. Ponder is the Executive Director for The Raptor Center and College of Veterinary Medicine faculty member. Dr. Ponder is a veterinary expert in avian health working in a clinical and research environment devoted to birds. She has extensive project management experience, as well as international experience working with non-profits and governmental agencies. She has managed projects varying from $10,000 to $2 million, addressing issues as diverse as wildlife health surveillance, community partnerships and international field research.

The University of Minnesota is a highly ranked public research university with a mission that encompasses research and discovery, teaching and learning, and outreach and public service. A land-grant university, it supports research and discovery benefiting the conservation and management of Minnesota's natural resources. It has well-established systems and processes for management of research awards and financial oversight of grants.