

**Environment and Natural Resources Trust Fund  
2014 Request for Proposals (RFP)**

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**Project Title:**

**ENRTF ID: 026-A**

Movements and Seasonal Habitat Use of Minnesota Elk

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

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**Total Project Budget: \$** 257,473

**Proposed Project Time Period for the Funding Requested:** 3 Years, July 2014 - June 2017

**Summary:**

The proposed project would provide some of the first biological data collected about Minnesota elk, including movements and habitat use. This information is essential to their long-term, sustainable management.

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**Sponsoring Organization:** MN DNR

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**Location**

**Region:** Northwest

**County Name:** Beltrami, Kittson, Marshall, Roseau

**City / Township:**

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<input type="checkbox"/> Funding Priorities	<input type="checkbox"/> Multiple Benefits	<input type="checkbox"/> Outcomes	<input type="checkbox"/> Knowledge Base
<input type="checkbox"/> Extent of Impact	<input type="checkbox"/> Innovation	<input type="checkbox"/> Scientific/Tech Basis	<input type="checkbox"/> Urgency
<input type="checkbox"/> Capacity Readiness	<input type="checkbox"/> Leverage	<input type="checkbox"/> Employment	<input type="checkbox"/> TOTAL <input type="checkbox"/> %



**PROJECT TITLE:** Movements and seasonal habitat use of Minnesota elk

## **I. PROJECT STATEMENT**

Elk were rare in Minnesota by the early 1900s mainly due to habitat loss resulting from settlement. Elk became reestablished in northwestern Minnesota through reintroduction efforts from 1914 through 1935 and immigration from Canadian herds. Today, elk are found in two primary herds near Grygla and in Kittson County in the Tallgrass Aspen Parkland focal area identified by the Minnesota Prairie Conservation Plan. Interest in Minnesota elk has been increasing in recent years. Elk-related tourism, which includes hunting and recreational viewing, has bolstered local economies in other states where elk have been reestablished. Elk are a keystone species in the prairie environment. Enhanced management of elk and their habitats in Minnesota would benefit many other species of wildlife utilizing the same habitats, and would increase opportunities for recreation and education.

Goals set by the MNDNR Elk Management Plan include population monitoring and management, elk habitat management, increasing landowner acceptance of elk by addressing landowner concerns, and public education about elk. Current population goals are to annually maintain 30-38 elk in the Grygla herd and 20-30 elk in the Kittson County herd. The MNDNR uses a limited annual allotment of hunting permits to manage the elk herds within these goal ranges. The long-term vision of the elk management plan is to enhance the population size and range extent of Minnesota's elk while maintaining coexistence with private landowners. As we approach the 100<sup>th</sup> anniversary of elk reestablishment efforts in Minnesota, there is still a paucity of basic ecological information related to Minnesota's elk herds. Improving our understanding about seasonal movement patterns and habitat use of elk would facilitate population monitoring processes, help evaluate current habitat and depredation management actions, and would allow us to develop science-based options for managing elk and their habitats in future years.

### **Goals of the project:**

#### **1.) Describe home range sizes and movements of adult elk**

Elk will be fitted with global positioning system (GPS) collars to obtain multiple locations on a daily basis. Using these data, we will determine home range sizes of elk during biologically critical time periods of the year (pre-calving through calving, post-calving through weaning, breeding, and winter seasons). In addition, we will examine shifts in home ranges and changes in core areas of use among seasons.

#### **2.) Seasonal habitat use**

We will use Geographic Information Systems (GIS) to classify habitats in Minnesota's elk range. Landscape-level habitat features important to elk will be identified by comparing location data from elk to land cover data of available vegetation types. Habitats with high seasonal use by elk will be investigated by field surveys to determine the species of vegetation and fine-scale habitat characteristics utilized by elk for food and cover.

## **II. DESCRIPTION OF PROJECT ACTIVITIES**

**Activity 1:** Describe home range sizes and movements of adult elk

**Budget: \$199,343**

Adult elk will be captured and fitted with GPS collars. We will set GPS collars to collect multiple daily locations of elk for one year. We will generate annual home ranges, seasonal home ranges, and core areas of use within annual and seasonal home ranges.



<b>Outcome</b>	<b>Completion Date</b>
1. Capture 20 adult elk and fit with GPS collars	3/15/2015
2. Complete collection of location data from collared elk	3/15/2016
3. Analyze locations to determine annual home ranges, seasonal home ranges, and movements	9/30/2016
4. Report findings	6/30/2017

**Activity 2: Seasonal habitat use**

**Budget: \$58,130**

We will classify primary habitat features and vegetation types in Minnesota’s elk range by using GIS to interpret land cover data provided by the Gap Analysis Project. Using elk location data, we will identify landscape-level habitat features utilized seasonally by elk. We will conduct field-based habitat surveys in areas of high use by elk to characterize the species and structure of vegetation preferred by elk during each season.

<b>Outcome</b>	<b>Completion Date</b>
1. Determine landscape-level habitats used by elk	9/30/2016
2. Characterize vegetation and habitat characteristics of areas of high use	3/15/2017
3. Report findings and make recommendations	6/30/2017

**III. PROJECT STRATEGY**

**A. Project Team/Partners**

Dr. Gino D’Angelo, MNDNR, project manager; Dr. Marrett Grund, MNDNR, co-investigator; Ms. Rachel Curtis, MNDNR, collaborator; Dr. Lou Cornicelli, MNDNR, collaborator; Mr. John Williams, MNDNR, collaborator; Ms. Leslie McInenly, MNDNR, collaborator; Mr. Joel Huener, MNDNR, collaborator; Ms. Christine Reisz, MNDNR, collaborator

**B. Timeline Requirements**

The study will require three years from planning to the reporting of results. Capture of elk will occur within 9 months of project initiation. Data collection via GPS collars will require one year. Habitat surveys will be conducted throughout the project following analysis of seasonal location data. Final data analysis and reporting will be completed over one year and three months.

**C. Long-Term Strategy and Future Funding Needs**

This study will provide some of the first information collected about movements, home ranges, and habitat use by elk since reestablishment of the species in Minnesota. These data will inform future management of the population and improvement of the habitats essential to elk.

## 2014 Detailed Project Budget

Project Title: *Movements and seasonal habitat use of Minnesota elk*

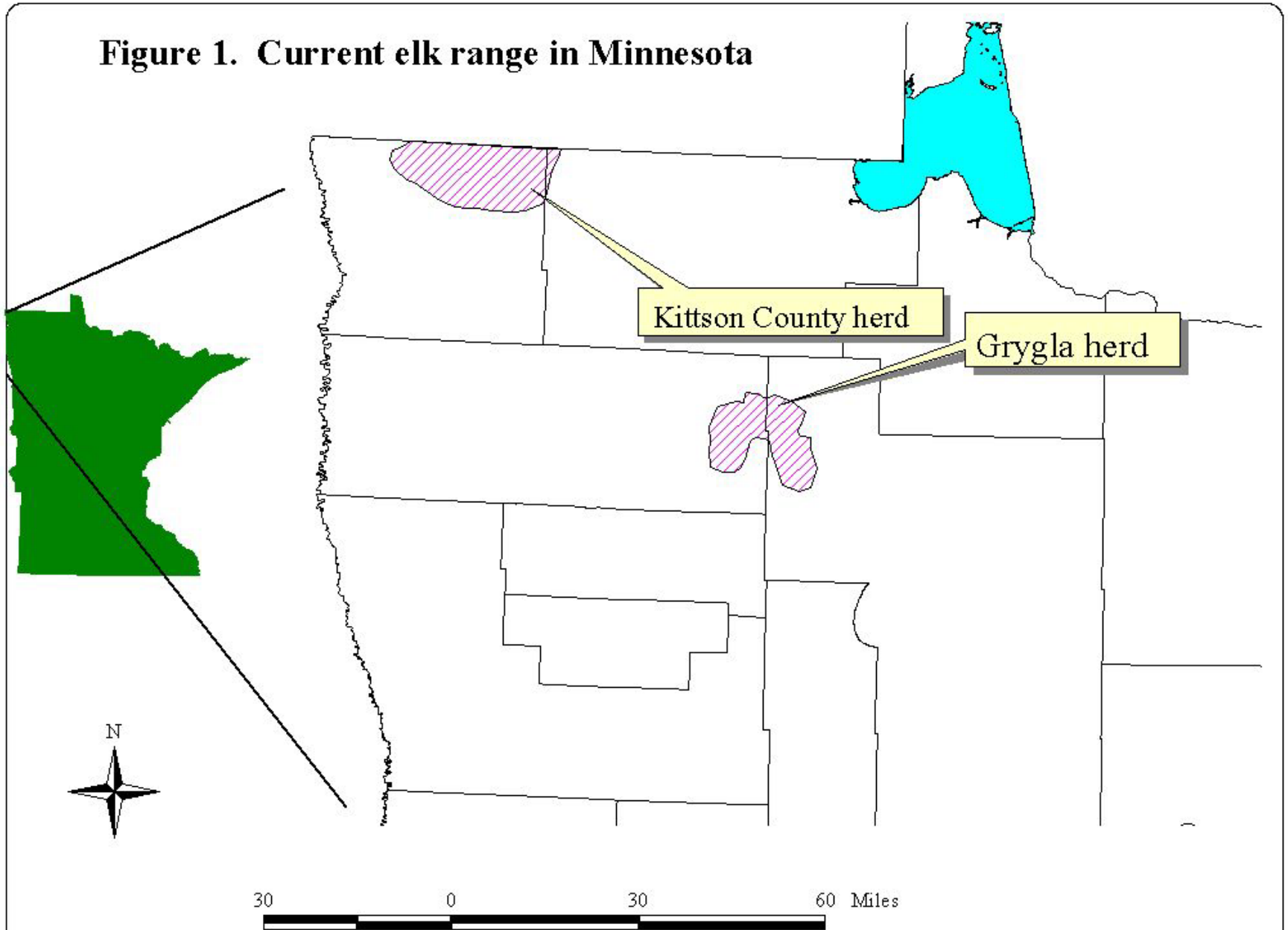
### IV. TOTAL ENRTF REQUEST BUDGET 3 years

<u>BUDGET ITEM</u>	<u>AMOUNT</u>
<b>Personnel:</b>	
Graduate student stipend for 2 years (50% research assistantship), leads fieldwork for analysis of home range and habitat data.	\$ 80,000
Student worker assists graduate student with vegetation sampling (400 hours@\$15/hr)	\$ 6,000
<b>Contracts:</b>	
Wildlife helicopter capture company (to be determined): Adult elk capture and handling (20 elk @ \$1,500 ea)	\$ 30,000
Iridium satellite adult elk data acquisition: transmission of locations and mortality messages	\$ 20,000
Technology support for programming collars, GPS, and GIS work	\$ 20,000
Total direct and necessary support services	\$ 21,173
<b>Equipment/Tools/Supplies:</b>	
GPS adult elk collars (20 @ \$2,500/each); collect location data, transmit temperature data and mortality notifications	\$ 50,000
Vegetation sampling supplies (measurement devices, GPS units, digital camera)	\$ 5,300
<b>Travel:</b>	
Travel to study area by elk project management staff and graduate student (fleet @\$0.55/mi, estimated 20,000 miles)	\$ 11,000
Meals and per diem for elk project management staff and graduate student	\$ 9,000
<b>Additional Budget Items:</b>	
Spotter plane to be used during capture efforts (20 hours@\$250/hr)	\$ 5,000
<b>TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND \$ REQUEST =</b>	<b>\$ 257,473</b>

### V. OTHER FUNDS

<u>SOURCE OF FUNDS</u>	<u>AMOUNT</u>	<u>Status</u>
<b>Other Non-State \$ Being Applied to Project During Project Period:</b>	\$ -	NA
<b>Other State \$ Being Applied to Project During Project Period:</b>	\$ -	NA
<b>In-kind Services During Project Period:</b>	\$ -	NA
MNDNR Farmland Populations and Research Group: multiple employees; project management, field work, data analyses, reporting of results; 36 months, 25% effort	\$ 63,656	Secured
<b>Remaining \$ from Current ENRTF Appropriation (if applicable):</b>	\$ -	NA
<b>Funding History:</b>	\$ -	NA

**Figure 1. Current elk range in Minnesota**





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

**2014 Main Proposal**

**Project Title:** Movements and seasonal habitat use of Minnesota elk

**PROJECT TITLE:** Movements and seasonal habitat use of Minnesota elk

**I. PROJECT MANAGER QUALIFICATIONS:** Gino J. D'Angelo, Ph.D.

Dr. Gino D'Angelo is the deer project leader of the Farmland Populations and Research Group of Minnesota Department of Natural Resources (MNDNR). Dr. D'Angelo serves as an expert on deer and deer ecology for farmland deer, including white-tailed deer and elk. He is responsible for designing, executing, and reporting independent and original research on deer, and to provide new knowledge that can be applied to deer management. He serves on MNDNR's deer management committee and wildlife depredation committee, and is a key participant in the development, evaluation, and implementation of MNDNR wildlife management policies required to ensure the sustainability of wildlife resources in the state.

Dr. D'Angelo holds of Bachelor of Science degree in Wildlife and Fisheries Management from the Pennsylvania State University. He earned Master of Science and Ph.D. degrees in Wildlife Ecology and Management from the University of Georgia, where his research focused on the ecology, behavior, and anatomy of white-tailed deer. He also conducted post-doctoral research at University of Georgia. Prior to his position at MNDNR, Dr. D'Angelo worked as a wildlife biologist for the U.S. Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services where he conducted research and operational management to minimize wildlife-human conflicts. Dr. D'Angelo has authored or co-authored numerous technical papers, including 15 peer-reviewed publications in the primary scientific literature.

As project manager, Dr. D'Angelo will coordinate the planning, implementation, and reporting of results of the proposed study. He will direct staff, administer budgets and contracting, and act as project liaison among the project team, partners, and LCCMR. Dr. D'Angelo is proficient in managing projects, and these responsibilities are primary aspects of his current position.

**II. ORGANIZATION DESCRIPTION:** MNDNR, Section of Wildlife, Farmland Wildlife Populations & Research Group

The mission of MNDNR is 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.

The MNDNR Section of Wildlife carries out research and management programs affecting all state wildlife species. The section acquires, develops, and manages wildlife management areas, most of which are open to public hunting during established seasons. The section also recommends hunting and other wildlife-related regulations, carries out census, survey and research projects, and promotes wildlife habitat protection and development on public and private lands.

Within the Section of Wildlife, the Farmland Populations and Research Group is responsible for providing information needed to manage major wildlife species in Minnesota's farmland zone which comprises all or parts of 74 counties and totals almost 49,000 square miles. To accomplish this responsibility, the group (1) coordinates and interprets population surveys; (2) conducts research which provides wildlife management information; (3) develops techniques needed to monitor and manipulate wildlife populations, manage critical wildlife habitats, and reduce or prevent wildlife damage; (4) evaluate management practices and programs; and (5) provides technical assistance and information to other DNR staff and the public.