Environment and Natural Resources Trust Fund
2018 Request for Proposals (RFP)

Project Title: **ENRTF ID: 026-A**

Statewide Wolf Survival Analysis to Build Management Capacity

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 333,179

Proposed Project Time Period for the Funding Requested: 3 years, July 2018 to June 2021

Summary:

Developing a statewide wolf-collar database (>250 wolves, ~1995-2018) will deliver urgently needed analysis of survival rates and mortality factors. Results will help support state management, reduce conflict, and inform stakeholders.

Name: Joseph Bump

Sponsoring Organization: U of MN

Address: 2003 Upper Buford Circle, 135 Skok Hall
St, Paul MN 55108

Telephone Number: (906) 231-7358

Email bump@umn.edu

Web Address

Location

Region: Statewide

County Name: Statewide

City / Township:

Alternate Text for Visual:

Support management by building a database from >250 wolves, 1995-2018, and 8 collaborators statewide.

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

PROJECT TITLE: ***Statewide Wolf Survival Analysis to Build Management Capacity***

I. PROJECT STATEMENT

- Support and enhance state wolf management by delivering foundational, urgent, and comprehensive analyses of survival rates and mortality factors based on long-term data from at least 8 sources statewide.
- Collate data from >250 wolves and tens of thousands of location records and then synthesize them into a collective database to build management capacity. Minnesota DNR is not in position to lead this effort.
- Identify and communicate recommendations used to reduce human-wildlife conflict, mitigate undesirable mortality causes, support state management, and build collaborative support across stakeholders.

GOAL: ***To support state management by completing comprehensive survival and mortality analyses for at least ~250 radio-collared Minnesota wolves from 1995 – 2018.*** Our **highly feasible** objectives are to:

1. Understand when, where, and why wolves die across the state and over at least two decades.
2. Identify and communicate recommendations to enhance the state's ability to manage wolves.
3. Build and maintain a database for future capacity to assist state management efforts.

WHY? Since 2003 wolves have been relisted under the Endangered Species Act four times. Such federal vs. state oscillations in wolf status challenge effective state management of wolf-human conflicts such as livestock depredations and can affect local support for wolves. Minnesota is committed to post-delisting monitoring in cooperation with the U.S. Fish & Wildlife Service and this project will add state management capacity to do so. ***Robust assessment of wolf survival and mortality is critical to the best possible monitoring. There is a continued, urgent need to assess wolf survival and mortality based on the best possible information available.*** Multiple Minnesota organizations possesses some, but not synthesized or fully analyzed, wolf-collaring data to determine survival and mortality with the latest quantitative methods. An independent, academic leader is well suited to develop a cooperative network and accelerate a synthesis of statewide data efficiently and effectively.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: ***Build database and determine survival rates of wolves in Minnesota.*** **Budget: $181,404**

We will collaborate with multiple agencies, tribes, and organizations to synthesize and analyze wolf-collaring data collected across the state. ***These collective data represent the best possible information source to comprehensively assess wolf survival and mortality throughout Minnesota wolf range. At this time, multiple DNR, university, and tribal researchers have agreed to share wolf-collaring data.*** We will compile records of radio telemetry locations for collared Minnesota wolves to build a database to answer, "*What are wolf survival rates and how have they varied through time in Minnesota?"*

Outcome	Completion Date
1. Develop collared wolf database from all cooperating statewide sources.	*December 2018*
3. Calculate sampled population survival rates using known-fate methods.	*September 2019*
4. Develop and communicate management recommendations related to survival.	*December 2019*

Activity 2: ***Determine cause-specific mortality of radio-collared wolves in Minnesota.*** **Budget: $139,775**

Radio telemetry systems employ a mortality signal when an animal becomes inactive for a period of time, which allows investigation of the cause of mortality. We will answer, *"When, why, and where do wolves die in MN?"*

Outcome	Completion Date
1. Use wolf population database to query mortality patterns.	*May 2020*
2. Compile seasonal and annual mortality causes.	*September 2020*
3. Develop and communicate management recommendations related to mortality.	*December 2020*

Activity 3: ***Deliver multimedia public outreach throughout Minnesota.*** **Budget: $12,000**

We will develop multiple outreach materials to communicate results to various stakeholders, including state and federal managers, tribes, state extension personnel, NGOs, and wildlife/outdoor groups.

Outcome	Completion Date
1. Develop public presentation for extension and outreach efforts.	*March 2021*
2. Create web and print materials to communicate final results.	*April 2021*
3. Present results to public and multiple stakeholder groups.	*June 2021*

III. PROJECT STRATEGY

A. Project Team/Partners

Our research team is uniquely capable of completing each activity efficiently and accurately. **Dr. Joseph Bump** [receiving funds] is the new Gullion Chair in Forest Wildlife Research at the University of Minnesota. Bump's position and professional network will help ensure successful collaboration with multiple groups, yet still provide the independence to create a firewall between the scientific analyses and management recommendations. This strategy is key to leverage buy-in of project results. He has 14 years of wolf research experience and has just completed analyses and outreach of wolf survival that directly inform Michigan wolf management. Bump will act as project manager and mentor a graduate student (**Aaron Morris**; Activities 1 & 2) and postdoctoral researcher (**William Severud**; Activities 1, 2, & 3) on the project.

B. Project Impact and Long-Term Strategy

PROFESSIONAL IMPACT: This project will directly enhance Minnesota's capacity to manage wolves. Decision makers and the public request predictions of various wolf management actions. Population modeling is used to develop these predictions, but requires inputs of wolf population vital rates. Critical inputs needed include the best possible estimates of survival rate and factors that affect mortality, which this project will deliver. Causes of mortality are needed in order to consider their relative effects and determine which factors state management may be able to mitigate.

PUBLIC IMPACT: Our public communication and outreach efforts will inform and address key concerns of stakeholders interested in wolf management.

MULTIPLE BENEFITS: This project will help meet Minnesota wolf management plan objectives, build wolf-monitoring capacity, and involve extensive outreach to the public. Having just completed a similar wolf project regionally, the project leader has the proven expertise, network capacity, and institutional independence to ensure successful completion, a high return on investment, and stakeholder buy-in to results within three years.

LONG-TERM STRATEGY: The database and models this project develops will be constructed and maintained so that each can easily be easily updated as future data is collected. Long-term goals include assessing wolf dispersal dynamics and seeking funding to understand wolf spatial ecology in Minnesota and the region.

C. Timeline Requirements

Three years of support are needed to complete this project. Year one will focus on wolf collar record compiling and database development. Year two will focus on survival analyses. Year three will focus on mortality analyses and statewide outreach and dissemination of results.

2018 Detailed Project Budget

Project Title: ***Statewide Wolf Survival Analysis to Build Management Capacity***

IV. TOTAL ENRTF REQUEST BUDGET: 3 years

BUDGET ITEM	AMOUNT
Personnel: ***subtotal = $324,179***	
Joseph Bump, Gullion Chair & Associate Professor, project management, participant coordination, co-lead paper publishing and public outreach: 3 weeks of summer salary (75% salary, 25% benefits) 6% FTE for 3 years.	$ 28,775
Aaron Morris, PhD student, data entry and management, analysis and modeling, paper publishing, and co-lead public outreach: (56% salary, 44% benefits) 50% FTE for 3 years.	$ 130,904
William Severud, postdoctoral researcher for database development, co-analysis, paper publishing, and co-lead public outreach and communication: (82.3% salary, 17.6% benefits) 100% FTE for 3 years.	$ 164,500
Travel:	
Mileage (~5000 miles), lodging, meals, for in-state travel by all project personnel to and from (multiple trips) data sharing partner offices (MN DNR, federal agencies, tribal wildlife agencies) and outreach presentation sites.	$ 5,000
Additional Budget Items:	
Printing & design services for outreach posters and and reports/flyers for distribution	$ 4,000
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 333,179

V. OTHER FUNDS

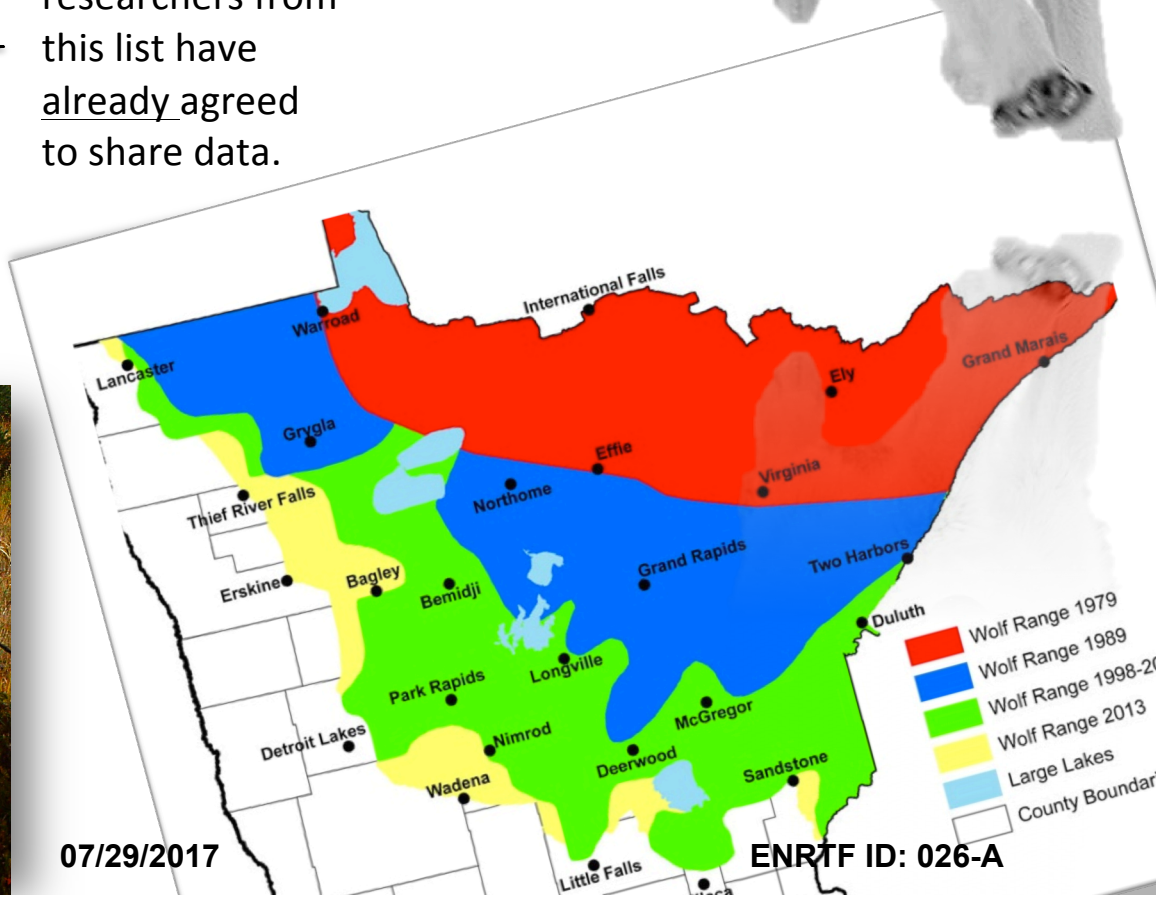
SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period: Voyageurs National Park Service grant to partially support an additional MS student to help with data entry and analyses.	$ 60,000	*Pending*
Other State $ To Be Applied To Project During Project Period: $5,000 from Gullion Chair and UMN research start-up funds to Project Lead JK Bump will be used for travel to present results at regional (e.g. Wolf Stewards), national (e.g. The Wildlfie Society) or international professional conferences (e.g. Conservation Biology). $28,775 from UMN research start-up funds to Project Lead JK Bump will be used to match summer salary request to deliver another 3 weeks of summer salary for the project (75% salary, 25% benefits) 6% FTE for 3 years. $5,000 + $28,775 = $33, 775	$ 33,775	*Secured*
In-kind Services To Be Applied To Project During Project Period: Forgone organized research indirect costs associated with this project (54% MTDC).	$ 152,591	*Secured*
Past and Current ENRTF Appropriation:	0	*N/A*
Other Funding History:	0	*N/A*
TOTAL OTHER FUNDS $ PENDING AND SECURED =	$ 246,366	

Statewide Wolf Survival Analysis to Build Management Capacity

1. **IMPACT & MULTIPLE BENEFITS:**
   - Deliver the best possible estimates of survival rates and mortality factors statewide
   - Address need to reduce wolf-human conflict
   - Help reach management plan objectives and federal monitoring requirements
   - Create and maintain long-term database
   - Communicate key information to the public
   - Leverage and build collaborative buy-in across stakeholders

2. **HOW?** Radio/GPS collar data from at least 250 wolves, 1995-2018, from a collaborative network:
   1. *University of MN Duluth*
   2. *MN DNR*
   3. *Voyageurs National Park*
   4. *1854 Treaty Authority*
   5. *Fond du Lac Band*
   6. *Red Lake Band*
   7. *Grand Portage Band*
   8. *Camp Ripley National Guard*

*Affiliated researchers from this list have already agreed to share data.



07/29/2017

ENRTF ID: 026-A

Statewide Wolf Survival Analysis to Build Management Capacity

PROJECT MANAGER QUALIFICATIONS:

Dr. Joseph K. Bump is an Associate Professor and the *Gordon W. Gullion Chair in Forest Wildlife Research and Education* in the Department of Fisheries, Wildlife, and Conservation Biology at the University of Minnesota. Bump's expertise is in wildlife ecology, management, and conservation, with a focus on large mammals. He has worked on wolf research and management since 2003. Most recently, he and two graduate students completed a similar project as the one described here for the state of Michigan. For Michigan, his lab efficiently and accurately managed 22 years of wolf collaring data and >30,000 wolf location records to create a database of 350+ individuals for assessment. The Michigan assessment will result in at least seven peer-reviewed publications, numerous presentations, and directly inform state management and conservation. Bump is an active member in The Wildlife Society, Ecological Society of America, and the American Society of Mammalogists. Each year he and his lab participate in the Midwest Wolf Stewards Conference.

Professional preparation

Michigan Technological University, Ph.D., Forest Science - wildlife ecology focus, Rolf O. Peterson, 2008
University of Wyoming, M.Sc., Zoology and Physiology, Statistics minor, James R. Lovvorn, 2003
University of Michigan, B.Sc., Biology with Honors Thesis, Gerald R. Smith, 1999

Editorships at peer-review journals in the field

2013 - *present* Subject Matter Editor, *PLOS ONE*
2011 – *present* Subject Matter Editor, *Oikos*

Journal peer review

Science; Proceedings of the Royal Society; Ecology Letters; Ecology; Ecography; Ecological Research; Oecologia; Oikos; Journal of Animal Ecology; PLOS ONE; Journal of Mammalogy; Animal Behavior; Journal of Wildlife Management; Wildlife Monographs; Rapid Communications in Mass Spectrometry; Current Anthropology; Naturwissenschaften.

PROJECT MANAGER RESPONSIBILITIES:

Dr. Joseph K. Bump will provide overall leadership, coordination, and oversight for each aspect of this project. Bump will be the primary advisor and mentor for the PhD student and postdoctoral researcher supported by this project.

ORGANIZATION DESCRIPTION:

The Department of Fisheries, Wildlife, and Conservation Biology at the University of Minnesota Twin Cities provides world-class training and expertise to contribute to the management, conservation, and sustainable use of fisheries and wildlife resources. Our goal is to use innovative teaching, research, and outreach to respond to societal needs for information and education pertaining to natural resources.