Environment and Natural Resources Trust Fund
2015 Request for Proposals (RFP)

Project Title: **ENRTF ID:** **022-A**

Unique Partnership Approach for Protecting Minnesotas Threatened Ecosystems

Category: A. Foundational Natural Resource Data and Information

Total Project Budget: $ 260,147

Proposed Project Time Period for the Funding Requested: 2.5 years, January 2016 - June 2018

Summary:

Unique Universty-Tribal partnership to build scientific capacity to protect Minnesota's natural resources in the face of growing environmental threats.

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Location

Region: NE

County Name: Carlton, Cook, Lake, St. Louis

City / Township: Grand Portage

Alternate Text for Visual:

The Grand Portage watershed and its important fish and wildlife resources.

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

PROJECT TITLE: Unique Partnership Approach for Protecting Minnesota's Threatened Ecosystems

PROJECT STATEMENT: Goal: Use unique Public-Tribal partnership to validate a 'model' ecosystem health monitoring network for the sustainability of wildlife health, ecosystem services and indigenous cultural practices within the Grand Portage Indian Reservation (GPIR). Faculty within the Ecosystem Health Initiative – UMN College of Veterinary Medicine – have spent the past five years developing and supporting partnerships between Universities and local/traditional communities in SE Asia and Africa. As a result, we have fostered the development of results-oriented training and research capacity building programs that address high priority health issues at the interface of protected and developed landscapes. Unfortunately, the focus of these efforts has largely been abroad through the support of USAID funding. As a result of recent strategic planning, we intend to apply these models and lessons more at home in Minnesota. Tribal Nations in Minnesota are ideal partners to employ this model of research-based partnership and capacity building, and we recently formed a partnership with the Grand Portage Indian Reservation to this end. A series of strategic planning meetings resulted in two main priorities for the partnership: sustainability of healthy natural resources in the face of climate and land use changes; and scientific capacity building within the tribe. Thus**,** this proposal fulfills the highest priorities of the GPIR leadership and of UMN College of Veterinary Medicine, but more importantly puts forth a model for University - Tribal engagement in MN and beyond. **An Urgent Issue:** Pristine waters and wildlife habitats of Minnesota are facing health threats from numerous environmental changes. Existing research is insufficient to properly plan for long-term sustainability of these natural resources. For instance, there exist few validated wildlife health monitoring metrics, no network for the widespread implementation of such metrics, and baseline data needed for decision making are rare or non-existent. Nowhere is this more the case then in Tribal areas where natural resources are of highest priority and expertise to manage them is often limited. Programs must be built and people trained to address this issue. **A Model Site:** GPIR occupies 56,000-acres in northeastern MN, is home to a unique biodiversity, and has high ecological, cultural and economic value. Much attention has been placed on the rapidly declining moose population, as well as other species of concern such as wolves, martins, diverse birdlife and a delicate aquatic resource of inland waters and Lake Superior. GPIR conducts some research and has valuable preliminary data resources (demonstrating threats of climate change, water quality and population viability); but the tribe has prioritized the creation of a more comprehensive *sustainability management system* to address the long-term risks posed by environmental change. This partnership was formed to address these gaps. **Project outputs:** When managing wildlife populations for long-term sustainable health, threats must be characterized, population health metrics identified, and baseline population-level values established. For this project, we propose to: 1) develop a tool, based on a set of standard metrics, to assess and monitor health of Minnesota's fish and wildlife populations and 2) validate this tool with GPIR natural resource managers and students through the collection of baseline data that will be used to construct a long term monitoring plan. The monitoring tool will be made widely available, and baseline data will be used to develop a long-term research and training program at GPIR that will serve as a model for inter-agency partnership and community-based efforts in safeguarding the health of our ecosystems.

II. PROJECT ACTIVITIES AND OUTCOMES

Activity 1: ***Develop Wildlife Health Monitoring Protocol through Community Engagement*** **Budget: $2,780**

Using a stakeholder engagement process, we will bring together GPIR community and scientific experts to design a monitoring system. We will identify key metrics of fish/wildlife health and indicators of environmental impacts, then design a sampling and health assessment protocol to obtain baseline data. Benefits include:

- Technical assistance will be provided to develop innovative methods based on the best current science.
- The protocol developed will be implemented as part of sustainable community-based program in GPIR.
- This monitoring protocol fills an essential gap in the ability to protect natural resources from degradation.
- In addition to immediate benefits to GPIR, this will serve as a model for natural areas throughout MN.

Outcome	Completion Date
1. Monitoring criteria for assessing impacts on wildlife health developed.	Spring 2016
2. Monitoring and wildlife health assessment protocol made available.	Spring 2016

Activity 2: ***Assess Baseline Health Conditions of Grand Portage Wildlife*** **Budget: $257,367**

Samples will be collected from three important GPIR habitat zones, Lake Superior, inland lakes/streams, terrestrial wildlife habitat. A total of 100 (50/yr) samples will represent a suite of species from each zone. Aquatic species will include top predators (i.e. Lake Trout), prey fish (i.e. Cisco), and filter feeders (i.e. mussels). Terrestrial species will include carnivores (i.e. wolf), herbivores (i.e. moose), and piscivore/scavengers (i.e. eagles). We will combine active sampling, opportunistic, and hunter-donated samples. We will leverage extensive on-going field efforts by GPIR biologists and use ENTR funds for additional supplies and personnel. From each sample, a variety of tests will be performed to determine baseline health condition including necropsy to observe gross lesions, histopathology to observe microscopic lesions, tests for heavy metals and organic toxins, and stress hormone analysis. Benefits include:

- This initial wildlife health assessment will make an essential contribution to our knowledge base, providing a baseline against which to judge future impacts, and helping guide resource protection.
- This has cross-over benefits to the preservation of water resources and our understanding climate change.

Outcome	Completion Date
1. Testing completed and samples archived for long-term storage: – Lake Superior fish: lake trout, cisco, etc – Inland lake/stream fish: yellow perch, mussels, etc – Terrestrial wildlife: moose, wolves, eagles, etc	Year 1: Summer 2016 Year 2: Summer 2017
2. Baseline levels documented for important wildlife health metrics including: – Contaminants – heavy metals and organic compounds – Disease presence based on pathology examination – Physical stress based on stress hormone analysis	Year 1: Winter 2016 Year 2: Winter 2017
3. Phase 1 complete establishing a long-term monitoring site and model for partnership between tribal groups, universities, and state agencies.	Spring 2018

III. PROJECT STRATEGY

A. Project Team/Partners

Our team is a unique partnership between academic, tribal, and state agencies. UMN partners specialize in addressing grand challenges at the intersection of animal, human, and environmental health. Project Manager Travis is a veterinary epidemiologist with a dedication to wildlife conservation and expertise in health monitoring and risk assessment; additional UMN team members include ecology, pathology, endocrinology and fish/wildlife health. GPIR is uniquely situated to monitor and protect natural resources, with an active research and natural resource program and highly supportive local community. Partner Seth Moore is a tribal lands biologist with deep expertise about GPIR resources and ties to community involvement and logistical support. In addition, partnership conversations have been initiated with several relevant State Agencies. ENRTF funds will be utilized by both UMN and GPIR to conduct fieldwork, lab work, and hire necessary personnel.

B. Project Impact and Long-Term Strategy

This project will improve our ability to monitor and manage health threats to MN wildlife from environmental change. It will provide a tool (set of methods) that may be used by anyone wishing to conduct this kind of program that will be packaged and available for download from our website. The baseline data we collect here will form the basis of a long-term monitoring and research/education site which may be used as a model for others to follow as this work becomes more imperative.

C. Timeline Requirements

Our project will be conducted over 2.5 years (January 2016 – June 2018). This will allow for development of innovative methods and protocols (Activity 1), and 2 seasons of sampling and health assessment (Activity 2).

2015 Detailed Project Budget

Project Title: Unique Partnership Approach to Protect Minnesota's Threatened Ecosystems

IV. TOTAL ENRTF REQUEST BUDGET *2.5* **years**

BUDGET ITEM	AMOUNT
Personnel: **Project Manager: Dominic Travis** - 4% FTE x 2 yrs (base 161K + 34% fringe) =$17,233 **Fish Health Specialist Nicholas Phelps** - 4% FTE x 2 yrs (base 98K + 34% fringe) =$10,460 **Vet. Pathologist: Arno Wuenschmann** - 4% FTE x 2 yrs (base 145K + 34% fringe) =$15,520 **Raptor Biologist: Julia Ponde**r - 4% FTE x 2 yrs (base 116K + 34% fringe) =$12,432 **Vet. Endocrinologist: Katey Pelican** - 4% FTE x 2 yrs (base 113K + 34% fringe) =$12,064 **Wildlife Disease Ecologist: Meggan Craft** - 4% FTE x 2 yrs (base 100K + 34% fringe) =$10,685 **Vet. Public Health Spec.: Larissa Minicucci** - 4% FTE x 2 yrs (base 104K + 34% fringe) =$11,175 **Post-doctoral Researcher: Tiffany Wolf** - 50% FTE x 2 yrs (base 44K + 20% frindge) =$52,800 **Grand Portage Intern: to be hired** - 50% FTE x 2 yrs (base 20K + 10% fringe) =$22,000	$ 164,367
Travel: **Planning meeting to be held in Grand Portage:** Van transit from UMN = $420 Lodging and meals for 8 people for 2 nights/3days = $2,360	$ 2,780
Additional Budget Items: **Field work:** logistics and sample collection and transport ($3,000 per field season) **Lab work - Sample processing and testing:** Analysis of contamination with heavy metals (300 samples x 60$ /sample) Analysis of contamination with organic toxins (300 samples x 75$/sample) Necroposy and general pathology exam (300 samples x 80$/sample) Analysis of stress hormone levels (300 samples x 75$/sample)	$ 93,000
TOTAL ENVIRONMENT AND NATURAL RESOURCES TRUST FUND $ REQUEST =	$ 260,147

V. OTHER FUNDS

SOURCE OF FUNDS	AMOUNT	Status
Other Non-State $ To Be Applied To Project During Project Period: **Partnership Development grant:** UMN College of Veterinary Medicine, Population Systems Signature Program	$ 20,000	Pending
In-kind Services To Be Applied To Project During Project Period: Grand Portage Biologist: Seth Moore - salary contribution ($25,000) Field logistics and personell for sample collection ($25,000) Preliminary sample collection and analysis by Grand Portage ($50,000) Laboratory resources at UMN College of Veterinary Medicine: Lab facilities and equiptment ($25,000) Veterinary specialist/diagnostician time ($180,000)	$ 305,000	Secured

Unique Partnership Approach for Protecting Minnesota's Threatened Ecosystems

We need baseline data and monitoring strategies to protect Minnesota's fish and wildlife resources from many future threats!

The UNIQUE BIODIVERSITY of the Grand Portage Indian Reservation faces MANY THREATS.

- This ecosystem has high value for ecology, culture, tourism, and economy.
- Damage to the entire Lake Superior watershed harms this ecosystem.
- Climate change alters habitat and stresses fish and wildlife populations.
- Resource extraction can threaten habitat and health for wild animals.

We can WORK TOGETHER to protect this ecosystem.

- Bring together local knowledge and scientific expertise.
- Initiate community-based ecosystem monitoring.
- Provide long-term ecosystem protection, capacity building, and learning opportunities.

Project Manager Qualifications

Dominic Travis, DVM, MS, Associate Professor of Epidemiology at the University of Minnesota College of Veterinary Medicine, is an active member of the College's growing Ecosystem Health Program. As former Vice President of Conservation and Science and Lincoln Park Zoo in Chicago, he managed a research portfolio of over fifteen million dollars with a team of over 50 scientific staff on 4 continents. At University of Minnesota, his primary research is aimed at the eco-epidemiology of complex health problems at the human, wildlife, and domestic animal interface. He is engaged in developing case studies of 'One Health' research in action, especially those that may further elucidate the relationship between biodiversity and health and the anthropogenic drivers that impact this relationship. He is also interested in how multidisciplinary teams can more efficiently deliver research-based solutions to these problems and how this knowledge gained is transferred into action in the real world. As part of the UMN School of Public Health, U-See Perl program of public health capacity building, he led an initiative entitled: "Engaging Tribal Nations in Health Partnerships." This resulted in a number of interactive discussions surrounding public-tribal partnerships in MN around the area of building health capacity. The relationship outlined in this grant was partially derived from this effort.

Organizational Description

The University of Minnesota's College of Veterinary Medicine "Ecosystem Health Initiative" is a relatively new program centered within the Department of Veterinary Population Medicine. The vision of the program: **The Ecosystem Health Initiative will link the deep resources of the University of Minnesota with key partners locally, nationally and globally to create new knowledge and new leaders to address emerging challenges arising at the intersection of animals, humans and the environment.** It has a core, dedicated, faculty (Phelps, Pelican, Craft, Ponder, Travis) from several scientific disciplines (ecology, fish health, endocrinology, epidemiology, public health and clinical medicine), as well as several post doctoral fellows and graduate students, residents and interns. Core members partner with hundreds of other academic and non academic professionals in many areas of the College, University, State and Federal Government, as non governmental organizations and a wide variety of Governments and Universities around the world. Our three-fold academic mission of teaching, service and research are embedded in the goals of the initiative as well as the proposed work herein.