



Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-088

Proposal Title: Minnesota Mammal Resource Atlas

Project Manager Information

Name: Ron Moen

Organization: U of MN - Duluth - NRRRI

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Project Basic Information

Project Summary: We will create the Minnesota Mammal Resource, a website that is a one-stop solution for current knowledge on all Minnesota mammal species.

Funds Requested: \$148,000

Proposed Project Completion: 2024-06-30

LCCMR Funding Category: Small Projects (H)

Secondary Category: Foundational Natural Resource Data and Information (A)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Minnesota has about 80 species of mammals. Some of these mammal species, like the white-tailed deer, are known to everyone. Other mammal species, like the shrews, are little brown animals that are occasionally seen dead on a trail or in a lawn. The ENRTF has funded many projects on Minnesota mammals.

Who needs to know about a Minnesota mammal species?

- An Area Wildlife Manager with the MN DNR responding to a planned forest harvest
- A high school student doing a report on the meadow jumping mouse
- An elementary school teacher developing a lesson plan on the river otter
- A trapper interested in the diet of the American marten
- A legislative staff member summarizing knowledge of threatened and endangered species

The reasons why to learn about a Minnesota mammal species are endless, the question is where and how will factual, current, and complete information on a species be obtained?

There is no single source for this information!

As a professional Mammalogist, I have more knowledge about mammals than most other people, but it is impossible for anyone to know all of the data and research that has been collected on any single Minnesota mammal species, let alone all 80 species.

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

We will create the Minnesota Mammal Resource, a website that summarizes and synthesizes available knowledge and data on all Minnesota mammals. Among the available sources:

- Mammals of Minnesota by Hazard, published almost 40 years ago in 1983
- Other Mammals of Minnesota books, published more than 50 years ago
- Regional Mammals books (e.g., Wisconsin, Iowa, Ontario, Eastern U.S.) published 20 to 60 years ago.
- Current and Past Research (Web of Science, Google Scholar)
- Bell Museum Biodiversity Atlas (ENRTF funding)
- Minnesota Biological Survey data (when available, also ENRTF funding)
- M.S. theses, Ph.D. dissertations, gray literature (some ENRTF funded)
- Web sites (species-specific, sometimes data-rich, general knowledge)
- Videos of behavior and habitats for selected mammals
- Links to webinars by other mammalogists and species experts

For each Minnesota mammal species, we will create accounts that summarize the current state of knowledge for that species. Example information included would be natural history, body weights, breeding season, distribution, historical patterns in distribution and abundance, and habitat use.

We envision the Minnesota Mammal Resource to be a one-stop solution for almost anyone with a need to learn about the mammals of Minnesota, with live links to other species information sources as appropriate.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

The project outcome is a living resource of existing knowledge and data on Minnesota Mammal species. Minnesota Mammal Resource content would be immediately accessible and useful for protection, conservation, preservation, and enhancement of the state's natural resources.

The Minnesota Mammal Resource provides a comprehensive summary of what we know about each mammal species in Minnesota that can be efficiently accessed by natural resource managers and the citizens of Minnesota in a single location.

Activities and Milestones

Activity 1: Develop Minnesota Mammal Resource website

Activity Budget: \$148,000

Activity Description:

The activity has three parts:

Part 1: Summarize and synthesize available knowledge, research, and data on Minnesota Mammal species

Part 2: Create website to access Part 1

Part 3: Updates based on user feedback and new research and Dissemination

In Part 1, we will use existing resources (15 Mammals of “Location” books, Web of Science and Google Scholar literature searches, my 10,000 article literature database) to create a comprehensive species account for each Minnesota mammal. Each species account will require about 1 week to complete.

In Part 2 we will develop the website to efficiently access knowledge and data for each Minnesota mammal species. We will use existing websites (e.g., Minnesota Breeding Bird Atlas, ENRTF funded), past experience with mammal specific websites (for teaching Mammalogy, and the Canada lynx, moose, and carnivore websites) to design the Minnesota Mammal Resource. Creating the Minnesota Mammal Resource website will require about 5 months.

The timeline of Activity Milestones results in completion of the Minnesota Mammal Resource website in 2 years. We will use year 3 to update each mammal species on the Minnesota Mammal Resource website, add content based on user feedback, and disseminate information to educators, agencies, and Minnesota citizens.

Activity Milestones:

Description	Completion Date
Develop Species accounts for 40 Minnesota Mammal species	2021-12-31
Initial draft of Minnesota Mammal Resource website	2022-03-31
Develop species accounts for remaining Minnesota Mammals	2022-12-31
Complete website with all Minnesota Mammal species published	2023-06-30
Website updates and publicizing	2024-06-30

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

Results will be implemented by summarizing and synthesizing information and data on mammals. Projects funded by ENRTF on mammals will be included, some done by the PI (moose, deer, wolves, bats, carnivores).

After completion, the Minnesota Mammal Resource will be periodically updated. A website is a dynamic living resource, and we learn more about mammals each year (e.g., White-Nose Syndrome in bats, also funded by ENRTF). The website will be hosted by the University of Minnesota for the foreseeable future, and we would develop maintenance funding from agencies or foundations for future updates estimated at about \$15K / year.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Genetic and Camera Techniques to Estimate Carnivore Populations	M.L. 2015, Chp. 76, Sec. 2, Subd. 03l	\$200,000
Endangered Bats, White-Nose Syndrome, and Forest Habitat	M.L. 2015, Chp. 76, Sec. 2, Subd. 03i	\$1,250,000

Project Manager and Organization Qualifications

Project Manager Name: Ron Moen

Job Title: Associate Professor / Senior Research Associate

Provide description of the project manager's qualifications to manage the proposed project.

Key Qualifications: Ron is a Wildlife Ecologist and Research Lab Manager at the Natural Resources Research Institute, University of Minnesota Duluth. He has over 25 years of research experience focusing on mammals, telemetry, and wildlife ecology.

EDUCATION:

Ph.D., 1995. University of Minnesota, Wildlife Conservation.

M.S., 1988. University of Minnesota, Wildlife. Plant Physiology Minor.

B.S., 1984. Cornell University, Division of Biological Sciences.

RELEVANT RESEARCH EXPERIENCE:

Dr. Moen has worked on and managed research projects on many different species while at NRRI, with over \$4 million of research projects on Minnesota mammals funded. In addition, Dr. Moen has taught Mammalogy at the University of Minnesota Duluth since 2003, and guided over 20 graduate students doing research on mammals in Minnesota to M.S. and Ph.D. degrees.

PUBLICATIONS ON MAMMALS (Examples, > 50 peer-reviewed, > 60 Technical Reports):

Moen, R.A., C.L. Burdett, and G.J. Niemi. 2008. Movement and Habitat use of Canada Lynx during denning in Minnesota.

Journal of Wildlife Management 72:1507-1513.

Moen, R., G.J. Niemi, and C. Burdett. 2008. Canada lynx in the Great Lakes. NRRI Technical Report No. NRRI/TR-2008/14.

McCann, N. and R.A. Moen. 2011. Mapping potential core areas for lynx (*Lynx canadensis*) using snowshoe hare (*Lepus americanus*) pellet counts and satellite imagery. Canadian Journal of Zoology 89:509-516.

Ditmer, M.A., J.R. Fieberg, R.A. Moen, S.K. Windels, S.P. Stapleton, and T.R. Harris. 2018. Moose movement rates are altered by wolf presence in two ecosystems. Ecology and Evolution 8(17):9017-9033.

Moen, R., and M. Swingen. (2018). Historical northern long-eared bat occurrence in Minnesota based on acoustic surveys. NRRI Technical Report No. NRRI/TR-2018-40.

Organization: U of MN - Duluth - NRRI

Organization Description:

The Natural Resources Research Institute is a University of Minnesota Duluth applied research organization. NRRI's mission is to deliver research solutions to balance Minnesota's economy, resources and environment for resilient communities.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Project Manager		Manage project, develop information content			26.7%	0.24		\$43,796
Content / Web developer		Develop website content and design, assist with content creation			24.1%	1.2		\$86,436
Undergraduate Research Assistant		Assist with literature searches, content development			0%	0.48		\$12,168
							Sub Total	\$142,400
Contracts and Services								
							Sub Total	-
Equipment, Tools, and Supplies								
							Sub Total	-
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Meetings to demonstrate Minnesota Mammal Resource website.	Costs include mileage, hotel, per diem using the current GSA approved rate.					\$1,200
	Conference Registration Miles/ Meals/ Lodging	Conference attendance (e.g., The Wildlife Society meetings, DNR Roundtable). Costs include conference registration fee and GSA approved rates for mileage, hotel, per diem.	Presentations/Discussion on Minnesota Mammal Resource website					\$801

							Sub Total	\$2,001
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Publication	Page charges for manuscripts describing the MMR process/website	Demonstrate utility and increase use					\$2,999
							Sub Total	\$2,999
Other Expenses								
		NRRI GIS Lab fee @ \$200 / year	Standard user fee for access to NRRI GIS lab					\$600
							Sub Total	\$600
							Grand Total	\$148,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
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Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	-
Non-State				
In-Kind	UMN unrecovered indirect costs are calculated at the UMN negotiated rate for research of 55% modified total direct costs.	Indirect costs are those costs incurred for common or joint objectives that cannot be readily identified with a specific sponsored program or institutional activity. Examples include utilities, building maintenance, clerical salaries, and general supplies. (https://research.umn.edu/units/oca/fa-costs/direct-indirect-costs)	Secured	\$81,400
			Non State Sub Total	\$81,400
			Funds Total	\$81,400

Attachments

Required Attachments

Visual Component

File: [a9909404-faf.pdf](#)

Alternate Text for Visual Component

Figure illustrating processes associated with data collection and synthesis to create the Minnesota Mammal Resource website.

Optional Attachments

Support Letter or Other

Title	File
Sponsored Projects Authorization	7f4762c6-6e9.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

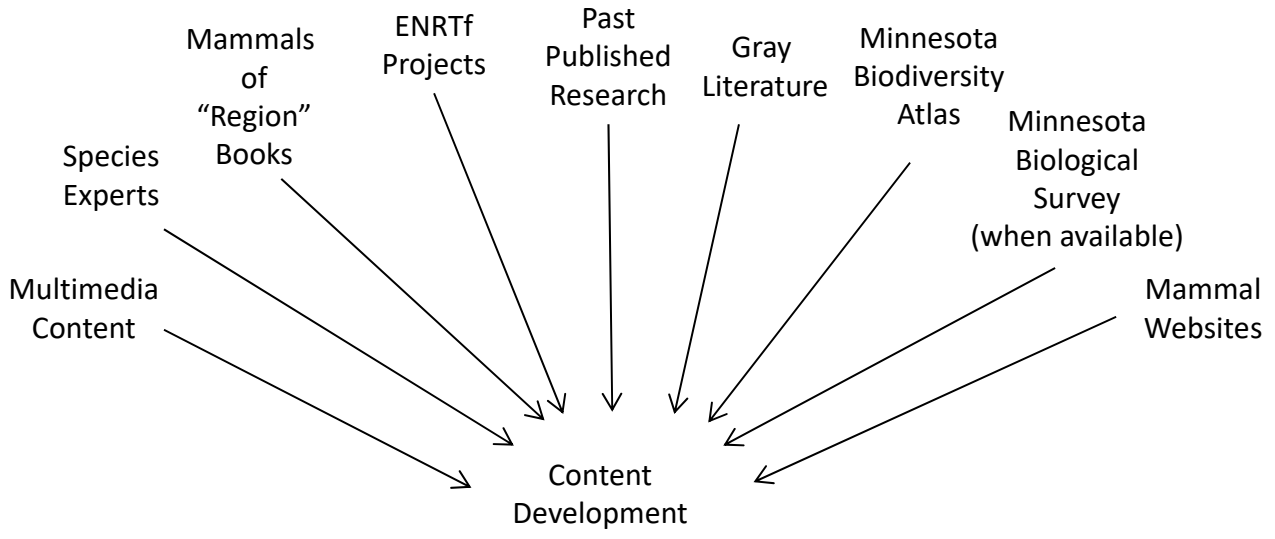
Does your project include research?

Yes

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration

Minnesota Mammal Resource



Website Design

