



Environment and Natural Resources Trust Fund

2023 Request for Proposal

General Information

Proposal ID: 2023-146

Proposal Title: Salvaged Wildlife to Inform Environmental Health, Ecology, Education

Project Manager Information

Name: Sushma Reddy

Organization: U of MN - Bell Museum of Natural History

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Project Basic Information

Project Summary: Establish a statewide network to collect, analyze, and archive salvaged dead wildlife and build a foundation of biodiversity resources to track ecosystem-wide changes, monitor environmental health, and promote public education.

Funds Requested: \$486,000

Proposed Project Completion: June 30, 2026

LCCMR Funding 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.

Everyday hundreds to thousands of animals are injured or killed due to natural and anthropogenic causes, such as collisions with windows, buildings, powerlines, windmills, vehicles, etc. While it is illegal for most people to handle wildlife, several local organizations and agencies have the permits to salvage deceased animals for scientific or educational resources. Current practices utilize only a limited portion of these specimens for taxidermy or specific research. We aim to expand the value of dead wildlife to inform across a broad spectrum of environmental health. Different parts of animal carcasses, herein birds and mammals, are useful for tracking the spread of diseases, tracing the prevalence of toxins, assessing environmental conditions, and understanding ecological interactions with other animals and plants (such as diet, migration). Each animal carries a wealth of information, not just of what species it is but also a record of where, when, and how it existed - offering a powerful lens into a shared ecosystem that humans also inhabit. Given the current pandemics (COVID19, HPAI) and fears of declining populations of animals critical to ecosystem health (pollinators, dispersers), building a strong system of environmental surveillance is key to being ahead of new threats and managing future impacts.

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

We propose to convert deceased birds and mammals, often discarded or overlooked, into valuable scientific data to advance understanding of ecosystem health and educate future scientists. First, we will build a network of organizations to systematically collect salvage wildlife across the state. This will be a unique collaboration bringing together efforts of wildlife officials, animal rehabilitation centers, and amateur naturalists acting through organized programs. Second, we will extract multiple types of information from specimens and archive them as resources of Minnesota biodiversity for future studies. We will dissect different body parts that contain information about diseases (viruses, parasites, microbes), toxins (pesticides, heavy metals, microplastics), and ecological interactions (diet, microbiomes) found in each animal. These samples will construct a baseline to identify emerging health and environmental threats, such as pandemics or ecological catastrophes, so we can better respond and protect the health of wildlife and humans alike. Finally, we aim to train students and educate the public about the value of scientific specimens. We are partnering with veterinary and research groups to develop innovative protocols for dissections of wild species and expand the scope of natural history collections. Public outreach programs will promote the interconnectedness of human and natural environments.

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?

Natural history museums are repositories of past and present biodiversity information. Our project will inform on various risks impacting wildlife and ecosystems across the state. This information can be crucial for understanding current conditions, invaluable for comparing to what we know of the past, and critical for establishing a baseline with which to predict future changes. Our project will be instrumental to monitor environmental health, advance knowledge of hidden and known ecological connections across species, and develop innovative ways to gather scientific knowledge from biodiversity samples. Results from our study will contribute to making informed management decisions.

Activities and Milestones

Activity 1: Coordinate network of organizations to acquire carcasses and educate the public about threats to wildlife

Activity Budget: \$170,394

Activity Description:

We will create a formal network of wildlife and conservation organizations to collect fresh carcasses from natural and anthropogenic sources like collisions with windows, buildings, powerlines, windmills, vehicles, etc. The Bell Museum and Science Museum of Minnesota will coordinate a system to gather these carcasses several times per year from state, federal, and tribal natural resource managers (such as MN-DNR, USGS, Fond du Lac Reservation), amateur naturalist groups who monitor window strikes (e.g., STOP the THUD program), non-profit groups (e.g., Friends of Sax-Zim Bog), environmental consultant companies (e.g., Western EcoSystems Technology) and wildlife rehabilitation centers (The Raptor Center, Wildlife Rehabilitation Center). Groups listed above have contributed specimens to our museums in the past. We will expand this network by inviting all organizations and agencies who are interested and have the appropriate state and federal permits to handle wildlife. We will implement careful protocols to maximize the amount of information that we can extract from each specimen with information-rich data sheets and provide freezers (on long-term loan) to store carcasses in-between transfers. Three times per year, museum staff will coordinate pick-ups across the state. We will create communication channels across the network to share information about project results.

Activity Milestones:

Description	Completion Date
Invite wildlife organizations and agencies to join network - establish protocols, permits, supplies, agreements	December 31, 2023
Coordinate pickups between institutions - 3x per year	April 30, 2026
Disseminate reports to partner organizations to inform the public - annually	June 30, 2026

Activity 2: Extract and archive samples for diseases, toxins, ecological interactions

Activity Budget: \$241,023

Activity Description:

The Bell Museum and Science Museum of Minnesota will coordinate efforts to receive, divide, and conduct the work needed to dissect specimens, properly take samples of different body parts, organize information in a database, and archive for future use. Both museums have a long history of being biodiversity repositories; however we aim to go well beyond traditional natural history techniques. We will get training from veterinary professionals (at UMN College of Veterinary Medicine; The Raptor Center) to learn proper methods of sampling for environmental health. We will preserve minimally five different tissue types - muscle for genomics; gastrointestinal tract for diet, microbiomes, microplastics; liver for disease and toxicity screens; nasopharynx for respiratory diseases; blood or heart for parasites, heavy metals, toxins. Then we will prepare an anatomical specimen by preserving the feathers/fur and/or skeleton for future research. There are few existing protocols for a broad array of species so part of our efforts will be to develop procedures that can work across the diversity of mammals, birds, and their associated parasites, symbionts, and diet species in MN. We will use the Biodiversity Atlas (previously funded by LCCMR) to organize and disseminate the information from each specimen (~500-1000/year).

Activity Milestones:

Description	Completion Date
Establish protocols for dissections and data collection	December 31, 2023
Training workshops by College of Veterinary Medicine and The Raptor Center	January 31, 2024

Activity 3: Train, Educate, Inform - train students, educate about the value of biodiversity to understand our world, inform public and policy makers

Activity Budget: \$74,583

Activity Description:

All project partners will work together to train and educate students - future wildlife managers and scientists - and the public about the often hidden value and interconnectedness of biodiversity. First, the Bell Museum will coordinate training of students with proper dissection techniques, organization of complex relational information, analysis of biodiversity networks, and relationships with other organizations. Thousands of students, both undergraduate and graduate, come to the University of Minnesota to pursue careers related to conservation. We will open this opportunity to students from other universities as well as high school students during the summers. It is critical for the future of conservation to train students with innovative data collection and analytical tools. Second, we request funding to conduct outreach activities at collaborating organizations at least three times a year. These public engagement activities will inform on the importance of biodiversity specimens and our ability to utilize them to uncover hidden connections between species. Finally, we will use the information gathered from these incidental deaths to inform the public and policy makers about human-related impacts on wildlife. All of the data associated with this project will be easily accessible to the public via the MN Biodiversity Atlas database.

Activity Milestones:

Description	Completion Date
Training Students in dissection techniques - annually	May 31, 2026
Summer internship program for high school, undergraduate and graduate students	June 30, 2026
Public engagement programs - 3 per year	June 30, 2026

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Catherine Early	Science Museum of Minnesota	Curator of Zoology. Will coordinate sampling and communicate information.	Yes
F. Keith Barker	Bell Museum, University of Minnesota	Curator of Genetic Resources; Will coordinate sampling, train students, and communicate information.	Yes
Sharon Jansa	Bell Museum, University of Minnesota	Curator of Mammals; Will coordinate sampling, train students, and communicate information.	Yes
Victoria Hall	The Raptor Center, University of Minnesota	Director; Will coordinate samples and training between wildlife rehabilitation centers and museums	Yes

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 work be funded?

Our aim is to create a systematic network to collect, analyze, and archive samples. Once the network is established and workflows developed, we believe the new activities will be integrated into standard operating procedures. Additionally, we intend to continue the benefits of this project by developing research collaborations. The acquisition of substantial samples will stimulate research and connect scientists across the state who are interested in analyzing them for various studies related to environmental health and conservation management. Finally, we believe this project will excite students to participate in innovative and integrative science and can lead to new educational opportunities.

Project Manager and Organization Qualifications

Project Manager Name: Sushma Reddy

Job Title: Associate Professor and Curator

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

Sushma Reddy is the Breckenridge Chair of Birds, Curator of Birds at the Bell Museum, and Associate Professor at the Department of Fisheries, Wildlife, and Conservation Biology at the University of Minnesota. Her training includes a BA from Barnard College, MA and PhD from Columbia University. Reddy has extensive experience at museums, working at the American Museum of Natural History in New York and the Field Museum of Natural History in Chicago, and conducting research in over 20 museums across the globe. Reddy has over two decades of experience working with birds, natural history collections, specimen research, public outreach, and education. She has published dozens of peer-reviewed research articles, conducted numerous biodiversity surveys, and trained more than 100 high-school, undergraduate, and graduate students to work with museum specimens.

In addition to being the curator in charge of the bird collection, Reddy is currently actively involved in several different aspects of the Bell Museum such as research, exhibits, education, and public engagement. She has several years of experience coordinating large, multi-institutional collaborations. She trains students and coordinates educational and public programs for people of all ages. Reddy has built ties to many statewide organizations related to conservation and wildlife to establish connections to natural history museum collections.

Organization: U of MN - Bell Museum of Natural History

Organization Description:

We are Minnesota's official natural history museum, established by the legislature in 1872 and held in trust by the University of Minnesota. For over a century, the museum has preserved and interpreted our state's rich natural history and served learners of all ages. Additionally, our scientific collections contain over one million specimens, representing every county in Minnesota and various locales around the globe. Collections are a source for Minnesota's biodiversity record, scientific research, and teaching materials for all levels of education. As Minnesota's state natural history museum, our mission is to ignite curiosity and wonder, explore our connections to nature and the universe, and create a better future for our evolving world. Our vision is to energize a community that embraces the transformative nature of science.

We believe education is a journey and we delight in the process of hands-on discovery. We believe in authenticity to engage curiosity. We reflect and respect diversity. We seek to preserve knowledge and biodiversity for the future. We value our visitors and partners and seek collaboration to enrich learning. We strive for excellence in all that we do and we are principled in the way we take care of our people and the planet.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Sushma Reddy, Curator of Birds		project coordination and training; Budget includes 1 month of summer salary per year; Dr. Reddy is on a 9-month salary with UMN that does not include summer research			33.5%	0.24		\$36,251
Sharon Jansa, Curator of Mammals		project organization; Budget includes 1 month of summer salary per year; Dr. Jansa is on a 9-month salary with UMN that does not include summer research			33.5%	0.24		\$39,912
F. Keith Barker, Curator of Genetic Resources		coordination and training of genetic resources; Budget includes 1 month of summer salary per year; Dr. Barker is on a 9-month salary with UMN that does not include summer research			33.5%	0.24		\$34,351
Research Technician		specimen data analysis, organization; Full-time position to prepare samples and organize data			28.7%	3		\$166,187
Veterinary Technician		specimen processing, training; 1 month salary per year for veterinary technician			28.7%	0.24		\$15,030
Dana Franzen-Klein, Veterinarian - The Raptor Center		training; 1-month salary per year to train students			33.5%	0.15		\$17,000
6 student interns (undergraduate or high-school)		specimen data analysis; 4 undergraduate and 2 HS per year for 2 years; 3rd year - 4 undergrad only			0%	12		\$33,853
2 Research Assistants - Graduate Students		specimen data analysis; outreach			23.6%	3		\$51,154
							Sub Total	\$393,738
Contracts and Services								
Science Museum of Minnesota	Sub award	To collect, analyze, and archive samples. Specifically, travel (~25%) to locations around the state, process and archive some of the specimens				0.48		\$47,637

		(~25%), and store specimens long-term for use in this and future research projects.						
Veterinary Diagnostics Laboratory	Professional or Technical Service Contract	To train technicians and students at museum to collect diagnostic samples for assessing animal health.				0.1		\$5,000
							Sub Total	\$52,637
Equipment, Tools, and Supplies								
	Tools and Supplies	samples tubes, storage boxes, specimen prep supplies	Supplied needed to analyze 500 specimens per year for 3 years					\$19,350
	Tools and Supplies	laboratory tube printer, labels	To organize samples and associated data using barcodes					\$1,175
	Equipment	5 chest freezers	To store specimens at partner organizations.					\$10,000
							Sub Total	\$30,525
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	To collect samples - 2 roundtrips per year (total distance is 1229 miles; mileage rate is 0.585) for 1 day and 2 persons plus meals during travel days (\$59.20 GSM). To conduct outreach activities 3 time per year, includes lodging, per diem for 4 persons for 1 overnight stay (\$96 lodging and \$59 M&I).	To collect samples from collaborating organizations in northeast, northwest, and southern MN - 2 roundtrips per year and to conduct outreach activities 3 time per year.					\$9,100
							Sub Total	\$9,100
Travel Outside Minnesota								

							Sub Total	-
Printing and Publication								
							Sub Total	-
Other Expenses								
							Sub Total	-
							Grand Total	\$486,000

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				
			Non State Sub Total	-
			Funds Total	-

Attachments

Required Attachments

Visual Component

File: [408e433a-a3d.pdf](#)

Alternate Text for Visual Component

Salvaged wildlife to inform environmental health, ecology, education; 1: Create MN network to collect salvaged wildlife; 2: Extract samples for diseases, toxins, ecological interaction; 3: Train, educate, inform students and public...

Optional Attachments

Support Letter or Other

Title	File
Support Letter - VDL	6db6533a-dea.pdf
UMN Authorization	d016b53f-572.pdf

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have potential for royalties, copyrights, patents, or sale of products and assets?

No

Do you understand and acknowledge IP and revenue-return and sharing requirements in 116P.10?

N/A

Do you wish to request reinvestment of any revenues into your project instead of returning revenue to the ENRTF?

N/A

Does your project include original, hypothesis-driven research?

Yes

Does the organization have a fiscal agent for this project?

Yes, Sponsored Projects Administration

Salvaged wildlife to inform environmental health, ecology, education

1: Create MN network to collect salvaged wildlife

- collaboration across wildlife organizations
- organize samples for testing
- specimens will be archived for future studies



2: Extract samples for diseases, toxins, ecological interaction

- parasites - mites, ticks, lice, nematodes
- muscle - genomics
- gastrointestinal tract - diet, microbiomes, microplastics
- liver - disease, toxins
- nasopharynx - respiratory diseases
- blood or heart - parasites, heavy metals, toxins
- anatomical specimen
- feathers/fur, skeleton
- diseases - viruses, pathogens



3: Train, educate, inform students and public



- train students in dissection skills
- outreach activities across MN
- publically available data using the MN Biodiversity Atlas



