



Environment and Natural Resources Trust Fund

M.L. 2025 Approved Work Plan

General Information

ID Number: 2025-113

Staff Lead: Tiffany Schaufler

Date this document submitted to LCCMR: June 9, 2025

Project Title: Expanding the Statewide Motus Wildlife Tracking Network

Project Budget: \$234,000

Project Manager Information

Name: Seth Stapleton

Organization: Minnesota Zoological Garden

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Project Reporting

Date Work Plan Approved by LCCMR: June 24, 2025

Reporting Schedule: March 1 / September 1 of each year.

Project Completion: June 30, 2028

Final Report Due Date: August 14, 2028

Legal Information

Legal Citation: M.L. 2025, First Special Session, Chp. 1, Art. 2, Sec. 2, Subd. 03j

Appropriation Language: \$234,000 the first year is from the trust fund to the Minnesota Zoological Society to expand the statewide Motus Wildlife Tracking System network into southwestern Minnesota and the North Shore to guide the conservation of imperiled grassland and boreal migratory birds and other wildlife. This appropriation may also be used to develop outreach and interpretive materials for Motus sites.

Appropriation End Date: June 30, 2028

Narrative

Project Summary: We will expand the statewide Motus wildlife tracking system network to fill in critical gaps, guiding the conservation of imperiled grassland and boreal migratory birds, their habitats, and other wildlife.

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

In 2019, researchers released a shocking comprehensive assessment of changes in North American bird populations. The study found a staggering 3 billion birds lost since 1970 in the U.S. and Canada, with declines seen in nearly every biome. Our understanding of these causes is incomplete yet habitat loss proved to be a major driver. Birds are often indicators of overall environmental health and their decline signals the likelihood that other wildlife species are experiencing similar stressors.

Minnesota is located along the Mississippi River flyway and tens of millions of birds fly through each spring and fall on their way to seasonal breeding grounds. Researchers have gathered valuable data on both resident and migratory birds in Minnesota but gaps remain. Grassland birds have lost the majority of their habitat, leading to dramatic population declines, yet how these species continue to utilize migratory stopover sites is not well understood. In addition, the northern shore of Lake Superior in Minnesota is a critical pathway for migrators on their way from boreal breeding grounds. Disconcertingly, approximately half of boreal forest species are in decline. As natural habitats across biomes are lost and altered, many other species of wildlife face uncertain futures as well.

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.

The Motus Wildlife Tracking System (Motus) is a global network of researchers that uses automated radio telemetry stations to track hundreds of species of migratory wildlife to understand their movements and survival across the landscape. By utilizing over 1,200 Motus stations strategically placed throughout the hemisphere, valuable data are gathered from many migratory bird species that cover vast distances. Researchers utilizing Motus stations can detect the many thousands of birds carrying telemetry tags from hundreds of research projects across continents.

Minnesota currently hosts about 12 active Motus stations located mainly along the Mississippi and Minnesota Rivers. There are large gaps throughout the western portion of the state and along the northern shore of Lake Superior. To address these, we will install approximately 4-6 Motus towers along the I-90 corridor in western Minnesota and repair 9 towers along the Lake Superior shoreline. Towers will be mounted on existing infrastructure when possible to limit costs and increase reliability. Each tower will be outfitted with at least 4 antennas to maximize detection probability.

Interpretive signage for stations in public access areas will also be developed to educate the public on this technology and its relevance to conservation of Minnesota's wildlife.

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?

Researchers continent-wide continue to deploy wildlife telemetry tags and a robust Motus network is needed to maximize their effectiveness. By installing Motus stations throughout Minnesota, we will build the infrastructure needed to improve the conservation of grassland and boreal birds here and generate data to inform land use planning.

Technology is also advancing such that transmitters may be deployed on other migratory wildlife including bats, dragonflies, and butterflies, allowing the utility of an expanded Motus network to extend across taxa.

Finally, we will raise awareness about our migratory wildlife and introduce the public to how Motus technology is advancing conservation.

Project Location

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

Region(s): NE, SW,

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

Activities and Milestones

Activity 1: Planning and installation of Motus towers across western MN and Lake Superior coastline.

Activity Budget: \$189,830

Activity Description:

The Minnesota Zoo will work with project partners to identify 4-6 locations in southwestern Minnesota, primarily along the I-90 corridor, and approximately 9 locations along the shore of Lake Superior that can reasonably accommodate Motus stations. Locations that allow for public engagement through interpretation will be prioritized such as rest stops and visitor centers. We will partner with the Minnesota Department of Transportation for installation logistics and support for locations along highways. The Natural Resources Research Institute (NRRI) in Duluth has nine Motus stations along Lake Superior that are no longer operable, but infrastructure remains. We will work with NRRI to repair and reinstall these stations, capitalizing on in-tact infrastructure.

Once locations have been identified and relevant partner organizations engaged, we will begin installation of Motus stations. The exact set-up for stations will vary based on location details but will generally consist of a 20–40-foot mast mounted on a building or tower with 4-6 antennas installed on each mast. Each station will require its own receiver and, if needed, an LTE modem and data plan. Locations with access to ethernet and Wi-Fi will be prioritized to increase reliability and minimize cost.

Activity Milestones:

Description	Approximate Completion Date
Select sites for Motus tower installation along two important migratory corridors.	September 30, 2025
Installation of first three Motus stations complete.	June 30, 2026
Installation of next six Motus stations complete.	November 30, 2026
Installation of remaining (4-6) Motus stations complete.	June 30, 2027

Activity 2: Develop and install interpretive materials to educate the public on the relevance of Motus technology for wildlife conservation in Minnesota.

Activity Budget: \$44,170

Activity Description:

The Motus wildlife tracking system is a unique opportunity to utilize technology to benefit a multitude of species across taxa and help protect their habitats. Informing the public on these efforts is critical in ensuring support. Not only does the protection of our state's wildlife directly impact the species most in need, it helps ensure our shared natural resources are supported for many future generations to enjoy.

We will partner with conservation staff at Audubon Minnesota to develop content on the threats migratory birds are facing and the importance of taking timely action to help them. Information on how Motus stations work and their usefulness in the field will be highlighted. We will coordinate with Audubon's Communications Manager to develop interpretive content that is impactful and digestible and install signage to accompany up to four Motus stations.

Activity Milestones:

Description	Approximate Completion Date
Selection of sites with optimal opportunity to engage with the public completed.	October 31, 2025
Creation of interpretive text and graphics related to Motus and its usefulness in conservation completed.	July 31, 2026

Production and installation of interpretive materials at approximately 4 Motus station sites completed.	June 30, 2027
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Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dale Gentry	Audubon Minnesota - Upper Mississippi River	Will help with implementation of Activities 1 and 2 and provide direction for Audubon's Communications Manager who will be supporting Activity 2.	Yes
Chris Smith	Minnesota Department of Transportation	Will support implementation of Activity 1- selection of sites and installation of Motus stations along the I-90 corridor.	No
Brian Smith	U.S. Fish and Wildlife Service	Will provide support for Activity 1 and expert guidance as needed as they have extensive experience with Motus station installation and use.	No
Kristin Hall	Minnesota Department of Natural Resources - Ecological and Water Resources	Will support Activity 1 and provide expert guidance as she has an extensive background in Motus station installation and operation.	No
Molly Tranel Nelson	Minnesota Department of Natural Resources - Parks and Trails	Will provide support and assistance with Activities 1 and 2 as it relates to Motus station installation at State Parks and Trails.	No
Alexis Grinde	Natural Resources Research Institute	We will work with NRRI to restore their Motus stations along coast of Lake Superior. They will provide support of Activity 1 and 2 as it relates to Motus stations on the north shore and have extensive background knowledge in the Motus wildlife tracking network.	No

Dissemination

Describe your plans for dissemination, presentation, documentation, or sharing of data, results, samples, physical collections, and other products and how they will follow ENRTF Acknowledgement Requirements and Guidelines.

We have budgeted time and resources to prepare high-quality interpretive displays detailing the technology and usefulness of Motus towers to be installed at a few public-facing locations, including at the Minnesota Zoo. This will help educate the public on the project and how we all benefit from the protection of our natural resources. Environment and Natural Resources Trust Fund will be acknowledged through use of the ENRTF logo and/or attribution language on all interpretive displays and website communications related to the project such as blogs and newsletter blurbs. In addition, all data collected by the Motus towers is automatically uploaded on the Birds Canada site which is public and free and easy to access. Anyone, including researchers or general audiences, can access the site and look up specific towers or state-wide programs and see what birds, both species and individual, have been picked up by the tower and when. You can also access the different research projects that are utilizing these towers on the site.

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?

This project contributes to wildlife conservation goals statewide. By expanding the Motus network we can fill gaps in our knowledge of prairie and boreal birds and create the infrastructure to support future research. Motus stations can be used by any research project that utilizes associated tags, including for species like bats, other mammals, and insects. We anticipate that subsequent research will be a part of the Minnesota Zoo’s conservation portfolio and we are committed to continuous support of the project. The Minnesota Zoo and Audubon Minnesota will explore options for funding to secure the ongoing functionality of the Motus towers.

Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Mapping Migratory Pitstops in Minnesota	M.L. 2023, , Chp. 60, Art. 2, Sec. 2, Subd. 03c	\$340,000

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
Personnel								
Conservation Biologist		Project Manager- Overall project management and coordination to complete Activities 1 and 2.			30%	0.5	X	\$64,840
							Sub Total	\$64,840
Contracts and Services								
TBD	Service Contract	Contractor will support the project via partner coordination, Motus installation, and development of interpretive materials related to Activities 1 and 2. Includes funding for personnel and travel.				0.26		\$44,500
TBD	Service Contract	Hire a contractor to help with Motus station installation at sites where installation cannot be completed by project staff alone. Some sites may be more challenging to install Motus stations and may require rental of a lift, climbing or complex electrical work.				0		\$25,000
TBD	Service Contract	Contract with a graphic designer to make customized illustrations for interpretive displays that are digestible and eye-catching. Graphics will explain the technology and use of Motus stations and be used on all interpretive displays.				0		\$1,500
TBD	Service Contract	LTE Data plan, if needed. A few stations may not have access to WI-FI or ethernet and would need an annual data plan.				0		\$960
							Sub Total	\$71,960
Equipment, Tools, and Supplies								
	Equipment	Motus station equipment. Each tower along I-90 costs ~\$9,000 in materials (x 6) and repairing stations (x 9) along Lake Superior costs ~\$25,000 total.	Will need antennas, masts, cables, and a station receiver at each Motus station. The stations along Lake Superior already have working antennas and will only need new cables and receivers and miscellaneous hardware.					\$79,000

	Tools and Supplies	Will need miscellaneous tools for Motus station installation such as: drills, wire cutters, screws/bolts, electrical tape, etc.	Tools and miscellaneous hardware is needed to install antennas to masts, masts to a building or structure, secure the station, and hardwire the station to an electrical source.					\$5,000
							Sub Total	\$84,000
Capital Expenditures								
							Sub Total	-
Acquisitions and Stewardship								
							Sub Total	-
Travel In Minnesota								
	Miles/ Meals/ Lodging	Fuel, food, and accommodation for work in state: Estimating 8 trips are needed with an average of 300 miles roundtrip each. Food and overnight lodging will be required for longer distances and trips that require installation at multiple sites. Reimbursement rates as allotted per the State of Minnesota travel regulations.	Travel will be needed to sites in western MN and northern MN to plan for and install Motus stations and interpretive displays.					\$6,000
							Sub Total	\$6,000
Travel Outside Minnesota								
							Sub Total	-
Printing and Publication								
	Printing	Creation and installation of interpretive signage at ~4 Motus station sites. Each sign costs ~\$1,800 to print and install, x4 signs.	We will develop interpretive signage for 4 Motus station sites that are public facing to raise awareness of Motus technology and its implications for Minnesota's natural resources.					\$7,200
							Sub Total	\$7,200

Other Expenses								
							Sub Total	-
							Grand Total	\$234,000

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
Personnel - Conservation Biologist		Project Manager- Overall project management and coordination to complete Activities 1 and 2.	Classified : A classified staff position will be partially supported by these ENRTF funds. This staff member will have the necessary expertise required to successfully coordinate Activities 1 and 2. The ENRTF funding will make it possible for the staff member to work on this project for the percentage of time indicated in the budget. Without this funding they would not be able to support this project with their time. Responsibilities for the classified staff will be reprioritized and reallocated as necessary to support this project.

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
State				
Cash	Minnesota Zoo's General Operating Budget	Administrative costs, utilities and other expenses associated with implementation of activities, estimated at 15% of the total request	Secured	\$35,100
			State Sub Total	\$35,100
Non-State				
			Non State Sub Total	-
			Funds Total	\$35,100

Total Project Cost: \$269,100

This amount accurately reflects total project cost?

Yes

Attachments

Required Attachments

Visual Component

File: [4c5e8ba3-c12.pdf](#)

Alternate Text for Visual Component

Title is: Expanding the Statewide Motus Wildlife Tracking Network with Minnesota Zoo and Audubon logos. Goal: Address critical gaps to guide conservation of imperiled grassland and boreal birds and other wildlife. Photos of birds and a Motus station surround primary photo of Canada warbler. Text highlighting project displayed....

Supplemental Attachments

Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, Other

Title	File
Letter of Support- USFWS	a692d6fa-2bd.pdf
Letter of Support- Natural Resources Research Institute	f5595ea0-010.pdf
Letter of Support- Minnesota Department of Transportation	4a5ab0b8-6e8.pdf

Difference between Proposal and Work Plan

Describe changes from Proposal to Work Plan Stage

We have shifted a few of the activity completion dates to more accurately reflect when we believe they can be completed. The activities themselves have not changed. None of the changes are significant and more than ~30 days. In addition, we corrected the number of FTEs for the contract with Audubon as we originally submitted the per year amount as the total. This does not change the budget which remains correct.

Additional Acknowledgements and Conditions:

The following are acknowledgements and conditions beyond those already included in the above workplan:

Do you understand and acknowledge the ENRTF repayment requirements if the use of capital equipment changes?

N/A

Do you understand that travel expenses are only approved if they follow the "Commissioner's Plan" promulgated by the Commissioner of Management of Budget or, for University of Minnesota projects, the University of Minnesota plan?

Yes, I understand the Commissioner's Plan applies.

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

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?

No

Does the organization have a fiscal agent for this project?

No

Does your project include the pre-design, design, construction, or renovation of a building, trail, campground, or other fixed capital asset costing \$10,000 or more or large-scale stream or wetland restoration?

No

Do you propose using an appropriation from the Environment and Natural Resources Trust Fund to conduct a project that provides children's services (as defined in Minnesota Statutes section 299C.61 Subd.7 as "the provision of care, treatment, education, training, instruction, or recreation to children")?

No

Provide the name(s) and organization(s) of additional individuals assisting in the completion of this project:

Dale Gentry, Audubon Minnesota; Sarah Hewitt, Audubon Minnesota; Seth Stapleton, Minnesota Zoo.

Do you understand that a named service contract does not constitute a funder-designated subrecipient or approval of a sole-source contract? In other words, a service contract entity is only approved if it has been selected according to the contracting rules identified in state law and policy for organizations that receive ENRTF funds through direct appropriations, or in the DNR's reimbursement manual for non-state organizations. These rules may include competitive bidding and prevailing wage requirements

Yes, I understand