



# Environment and Natural Resources Trust Fund

## 2027 Request for Proposal

### General Information

**Proposal ID:** 2027-483

**Proposal Title:** Moose Monitoring on the Leech Lake Reservation

### Project Manager Information

**Name:** Tanya Roerick

**Organization:** Leech Lake Band of Ojibwe

**Office Telephone:** (218) 513-3312

**Email:** tanya.roerick@llojibwe.net

### Project Basic Information

**Project Summary:** We will monitor and assess moose population dynamics, spatial ecology and health data in a moose population that is outside of core moose range on the Leech Lake Reservation.

**ENRTF Funds Requested:** \$675,000

**Proposed Project Completion:** June 30, 2030

**LCCMR Funding Category:** Fish and Wildlife (D)

### Project Location

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

Region(s): Central

**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.**

Moose hold deep cultural and spiritual significance for the Leech Lake Band of Ojibwe and are listed as a Species of Management Concern on the Band's Threatened, Endangered, and Sensitive Species List. Historically, the Leech Lake Reservation (LLR) was considered to be part of primary moose range. By 1965, MNDNR reclassified the Leech Lake area as secondary moose habitat, and by 1986 the LLR was no longer considered to be within moose range. These range shifts are likely linked to factors such as the expansion of white-tailed deer following intensive logging, climate change, habitat fragmentation, and other anthropogenic factors. Today moose continue to be greatly impacted by habitat loss, predators, and parasites. Despite this, moose continue to occur on the LLR, though their abundance and distribution remain largely unknown. In response, we initiated our first aerial moose survey in 2023 and collared several moose in 2026 as part of an effort to better understand the local moose population. We now aim to expand this work to study the spatial ecology and health of moose living outside their core range. The information gained will support the development of moose conservation plan, habitat enhancement recommendations, and strengthen collaboration.

### **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 monitor and assess moose population dynamics and spatial ecology through aerial surveys and capture and collaring of moose. Aerial surveys will allow us to estimate moose abundance across different areas of the Leech Lake Reservation and evaluate reproduction by documenting the presence of calves. Capturing and collaring moose will enable us to collect biological samples, including blood, hair, ticks, and feces, while animals are immobilized. These samples will be used to evaluate parasite loads, screen for tick-borne diseases, and assess overall health. Each immobilized moose will also be fitted with a GPS radio collar, allowing us to track movements and better understand habitat use and spatial ecology. Additionally, we will interview community members and natural resource professionals to document their views of moose. This work will be conducted in collaboration with the University of Minnesota.

### **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?**

This project will provide valuable information about moose occurring outside their core range, where habitat conditions differ from those in core areas. Through this work, we will gain a better understanding of moose habitat use, survival, reproduction, and overall health. The knowledge gained will inform future habitat enhancement efforts, support the development of our moose conservation plan, and strengthen collaboration with our community, MNDNR and other partner agencies, and public stakeholders.

## Activities and Milestones

### Activity 1: Assess moose population dynamics and spatial ecology

**Activity Budget:** \$612,129

**Activity Description:**

Moose population dynamics and spatial ecology are largely unknown in this area of Minnesota, where moose occur outside of core range at relatively low densities. Winter aerial surveys will be conducted to gather information on moose abundance, recruitment, and age/sex structure. Surveys will also locate moose for later capture efforts. Survey areas will rotate each year because it will be impractical to survey the entire Reservation annually. Trail cameras will be placed prior to surveys in new areas to assess presence of moose. Survey routes will be gridded out with transects to optimize detection. Upon moose observation, GPS location will be recorded, along with sex, age, number of animals in the group, forest type, canopy cover, and percent hair loss from ticks.

Moose capture and collaring efforts will immediately follow surveys. We aim to capture approximately 5-8 adult moose annually and re-collar existing study animals (4). We will fit each with a GPS radio collar that will store and send locations, as well as, send mortality alerts to project biologists. This data will allow us to assess moose movements, habitat use, and investigate mortalities. We will also apply ear tags and collect biological data for health assessment (Activity 2).

**Activity Milestones:**

Description	Approximate Completion Date
Conduct aerial surveys for annually in 2028, 2029, and 2030	March 31, 2030
Capture and collar moose annually in 2028, 2029, and 2030	March 31, 2030
Monitor and assess moose movements and habitat use	March 31, 2030
Analyze data, develop habitat enhancement recommendations and LLBO moose conservation plan.	June 30, 2030

### Activity 2: Moose Health Assessment

**Activity Budget:** \$29,842

**Activity Description:**

Little to nothing is known about the health and survival of moose outside of their core range in Minnesota. Yet, recent aerial surveys suggest that not only are moose present at low numbers on the Leech Lake Reservation, but they are reproducing. To better understand the dynamics and trajectory of moose living outside of core range, we will collect biological samples to assess health at the time of capture and collaring. Specifically, we will collect blood, hair, feces, ticks, and tissue samples according to established protocols, and screen for parasites and pathogens such as those of cattle and other livestock (e.g., bovine viral diarrhea, liver flukes) and other wildlife (e.g., Leptospira), as well as primary pathogens of moose (e.g., Parelaphostrongylus tenuis). We will also screen archived samples collected from moose captured in prior years. All mortalities of collared moose will be investigated within 24 hours of a mortality signal, at which time a field investigation and necropsy with collection of tissues and biological materials will be obtained to determine cause of mortality. As data allows, we will assess annual survival and how health and habitat use contribute to survival.

**Activity Milestones:**

Description	Approximate Completion Date
Collect samples from moose at winter 2028, 2029, 2030 capture and submit for laboratory analysis	March 31, 2030
Investigate and conduct necropsy on any mortalities that occur	May 31, 2030

### Activity 3: Community Engagement and Outreach

**Activity Budget:** \$33,029

**Activity Description:**

As part of our efforts to engage community members on the project, we want to better understand historical and current community perspectives on moose. To do so, a University of MN veterinary resident will assist us to conduct 20-25 interviews with community members and local natural resource professionals to document views of moose and their health. For interviews with community members, we will try to reach diverse perspectives from elders, hunters, landowners, including local tribal and non-tribal community members. In these interviews, we will ask about the cultural significance and use of moose, interest in moose conservation, and views of the local moose population. Interviews with natural resource professionals (biologists, foresters, etc.) will focus on moose conservation, habitat enhancement possibilities, and views of the sustainability of the local moose population. Results from these interviews will be incorporated into ongoing engagement about this project and the moose population. For example, we will generate outreach that contextualizes what we are learning from this study about the existing local moose population with historical and current community perspectives. In this way, we can reflect community values in the way we communicate the science.

**Activity Milestones:**

Description	Approximate Completion Date
Conduct community and natural resource professional interviews	August 31, 2028
process and analyze interview data	December 31, 2028
Develop outreach materials on project, incorporating community values with population data	March 31, 2029
Draft manuscript and submit for publication	June 30, 2029
Update outreach materials with most recent moose population data	May 31, 2030

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Dr. Tiffany Wolf	University of Minnesota	Co-Investigator and Veterinarian	Yes
Todd Tisler	Chippewa National Forest	Will assist with study design, selection of areas for sampling, and coordination on land management activities during the study as well as implementing study recommendations on an experimental basis.	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.**

The moose monitoring project will be shared in several ways. Findings will be shared with biologists and other natural resource professionals through the MN Tribal Fish and Wildlife Committee, DNR Moose Committee, publication in a biological journal, and presentation at a natural resources conference. We will also share habitat enhancement recommendations with the Chippewa National Forest and MNDNR. Additionally, we will participate and share about our moose project in public media and presses releases, if requested. Lastly, we often participate in community events and will share our project with event attendees.

## 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?**

Results from this project will contribute towards moose conservation efforts in the state of Minnesota, support the development of LLBO's moose conservation plan, and future habitat enhancement efforts when working with other land management agencies (Chippewa National Forest and MNDNR). After project completion, our goal is to continue monitoring efforts and develop and implement habitat enhancement (if needed) if future grant funding can be found. Long term datasets are valuable and can indicate changes not seen over short periods of time.

## Project Manager and Organization Qualifications

**Project Manager Name:** Tanya Roerick

**Job Title:** Wildlife Program Director/Lead Biologist

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

Tanya Roerick has a Master's degree in Wildlife Science and has 15 years of experience in the wildlife field. She has worked for the Leech Lake Band of Ojibwe for approximately 8 years. Tanya initiated the Leech Lake Band of Ojibwe's first moose survey efforts in 2023. Since then she has grown the project to include larger survey areas and collared the projects first 4 moose in 2026. Tanya has extensive experience initiating, designing, and conducting research and monitoring projects and habitat enhancement projects. This also includes supervising staff, managing budgets, and writing reports.

**Organization:** Leech Lake Band of Ojibwe

**Organization Description:**

The Leech Lake Band of Ojibwe is a Federally recognized sovereign Tribal Nation. The Leech Lake Band of Ojibwe is committed to the responsible operation of government, preservation of our heritage, promotion of our sovereignty, and the protection of natural resources for our elders and future generations, while enhancing the health, economic well-

being, education, and our inherent right to live as Ojibwe People. The Leech Lake Band of Ojibwe Division of Resource Management (LLBO DRM) was formed in 1976 and is a natural resource agency that protects and enhances the LLBO's natural resources for future generations. The Division serves over 9,000 Leech Lake tribal members through 7+ programs that oversee fish, wildlife, plants, forestry, fire, and other environmental needs of the Band on 864,158 acres. The Fish and Wildlife program was created in 1984 and works to protect and enhance the fish and wildlife populations on LLBO for current and future generations of Tribal members.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Wildlife Outreach Coordinator		Assist with aerial surveys, processing of biological samples to send to lab, fieldwork (trail cameras, field necropsies, etc.) and community outreach and engagement.			30%	0.15		\$9,489
Wildlife Field Specialist		Assist with aerial surveys, prep work for surveys and captures, and fieldwork (trail cameras, field necropsies, etc.).			30%	0.15		\$9,750
Wildlife Specialist		Assist with aerial surveys, observer on spotter plane, fieldwork (trail cameras, field necropsies, etc.), ordering supplies, prep work for surveys and captures.			30%	0.36		\$28,275
Wildlife Program Director/Lead Biologist		oversees project, responsible for budget and narrative reports, purchasing supplies, conducts moose captures, aerial surveys, field investigations, and data analysis.			30%	0.36		\$41,079
							<b>Sub Total</b>	<b>\$88,593</b>
<b>Contracts and Services</b>								
Professional Wildlife Capture Company	Service Contract	The professional wildlife capture company will provide a helicopter and crew to conduct aerial moose surveys and captures.		X		0		\$250,000
University of Minnesota	Subaward	Funds will be used towards personnel, travel, and purchase of supplies such as capture drugs and supplies, diagnostic testing, and manuscript publication fees.				0.9		\$125,186
Professional Spotter Plane	Service Contract	The professional spotter plan will provide assistance with capturing moose by locating moose for the wildlife capture company to target.				0		\$50,000
							<b>Sub Total</b>	<b>\$425,186</b>
<b>Equipment, Tools, and Supplies</b>								

	Equipment	GPS satellite moose collars. Approximately \$3500/collar for 28 collars. Includes warranty.	GPS collars record location data that are necessary to meet project Activities and Milestones. Sole sourcing to Vectronic Aerospace is requested to maintain the same data collection. We have compared pricing to other companies to ensure pricing and collar capabilities is competitive.						\$98,000
	Tools and Supplies	Field Supplies	Field supplies for captures, mortalities, and monitoring.						\$15,400
	Tools and Supplies	30 Trail Cameras and supplies (batteries for 3 years, 2 SD cards per camera, camera locks)	Trail cameras will be placed in areas where moose sign is found to help investigate and prioritize new areas for surveys and captures.						\$10,991
	Equipment	Data subscription and transmission fees	GPS collar fees: Iridium subscription fee per collar per year = \$180; Iridium location transmission fee per collar per year = \$185. We plan to have 12, 20, and 28 collars on air each year of the project, respectively. Collar life is approximately 3 years.						\$21,900
	Tools and Supplies	NVivo	NVivo provides software to assist in analyzing transcriptions from interviews. Requires annual subscription (\$430). Needed for one year.						\$430
								<b>Sub Total</b>	<b>\$146,721</b>
	<b>Capital Equipment</b>								
								<b>Sub Total</b>	-
	<b>Acquisitions and Stewardship</b>								
								<b>Sub Total</b>	-
	<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	5-6 trips, approximately 3500 miles at a mileage rate of 0.75, lodging (estimated \$100/night), and per diem at \$68/day	Travel between Minneapolis, MN and Cass Lake, MN multiple times to support project activities.						\$7,000

							<b>Sub Total</b>	<b>\$7,000</b>
<b>Travel Outside Minnesota</b>								
	Conference Registration Miles/ Meals/ Lodging	1 trip, miles (\$0.725/mile) or airfare dependent on conference location, lodging (estimated to be \$110/night), and per diem (estimated to be \$68/day) for up to 4 people for a 3-5 day conference.	Travel for conference to present moose project to other natural resource professionals. Conference TBD, but could be North American Moose Conference, The Wildlife Society MN Chapter Conference, or Native American Fish and Wildlife Society Conference.	X				\$5,000
							<b>Sub Total</b>	<b>\$5,000</b>
<b>Printing and Publication</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Other Expenses</b>								
		Honoraria for interviewees	\$100 honorarium for 25 interviewees in exchange for their time and knowledge about moose.					\$2,500
							<b>Sub Total</b>	<b>\$2,500</b>
							<b>Grand Total</b>	<b>\$675,000</b>

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Contracts and Services - Professional Wildlife Capture Company</b>	Service Contract	The professional wildlife capture company will provide a helicopter and crew to conduct aerial moose surveys and captures.	We need to employ a professional wildlife capture company and these companies are not located in Minnesota.
<b>Travel Outside Minnesota</b>	Conference Registration Miles/Meals/Lodging	1 trip, miles (\$0.725/mile) or airfare dependent on conference location, lodging (estimated to be \$110/night), and per diem (estimated to be \$68/day) for up to 4 people for a 3-5 day conference.	The North American Moose Conference and Native American Fish and Wildlife Society Conference change locations every year to different states. Most likely these conferences will not occur in MN, but are great ways to share our project to other moose biologists and other tribal biologists, respectively. We may be able to present at The Wildlife Society MN Chapter Conference in MN, but this conference often interferes with our moose survey and capture fieldwork, which is why we would like to leave this open to out of state travel options.

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
<b>State</b>				
			<b>State Sub Total</b>	-
<b>Non-State</b>				
In-Kind	Tribal	We will provide trucks, truck fuel and maintenance, GPS units, and computers for staff. This may also include additional supplies and staff time needed for the project. This is an estimate of what we anticipate contributing as in-kind, but may change based on the needs of the project.	Potential	\$15,000
			<b>Non State Sub Total</b>	<b>\$15,000</b>
			<b>Funds Total</b>	<b>\$15,000</b>

**Total Project Cost: \$690,000**

**This amount accurately reflects total project cost?**

Yes

## Attachments

### Required Attachments

#### *Visual Component*

File: [4ab0bfb8-561.pdf](#)

#### *Alternate Text for Visual Component*

This project is located on the Leech Lake Band of Ojibwe Reservation. A large portion of the Reservation overlaps with the Chippewa National Forest and is co-managed by both the Tribe and National Forest. Other landowners within the Reservation boundary include Minnesota DNR, four counties, and private landowners...

#### *Board Resolution or Letter*

Title	File
Tribal Council Letter	<a href="#">a1b62a45-8fe.pdf</a>

### Supplemental Attachments

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

Title	File
Letter of Support from 1854 Treaty Authority	<a href="#">a011d3c9-397.pdf</a>
Letter of Support from Chippewa National Forest	<a href="#">0f0ed593-6d0.pdf</a>
U of M Endorsement Letter	<a href="#">44acb760-6f9.pdf</a>

## Administrative Use

**Does your project include restoration or acquisition of land rights?**

No

**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?**

Yes

**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 proposal:**

Dr. Tiffany Wolf, University of Minnesota

**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