



## Environment and Natural Resources Trust Fund

M.L. 2025 Approved Work Plan

### General Information

**ID Number:** 2025-009

**Staff Lead:** Mike Campana

**Date this document submitted to LCCMR:** June 17, 2025

**Project Title:** Fond du Lac Deer Study - Phase 1

**Project Budget:** \$1,441,000

### Project Manager Information

**Name:** Jacob Haus

**Organization:** Minnesota State Colleges and Universities - Bemidji State University

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### Project Reporting

**Date Work Plan Approved by LCCMR:** June 26, 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. 03a

**Appropriation Language:** \$1,441,000 the first year is from the trust fund to the Minnesota State Colleges and Universities for Bemidji State University to collect baseline deer demographic, movement, and habitat-use data before elk restoration to better inform management of both elk and deer populations on the Fond du Lac Reservation and surrounding areas.

**Appropriation End Date:** June 30, 2028

## Narrative

**Project Summary:** Deer are important to the FDL Band and elk reestablishment could alter deer population dynamics. Baseline data will better inform future deer management by the RMD and Minnesota DNR.

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

Waawaashkeshi (white-tailed deer) are a species of social, cultural, and economic importance to the FDL Band as well as to non-tribal members within the region. Over the last 20 years, deer harvest and abundance has been declining on the Reservation and surrounding areas of the 1854 Ceded Territory. Reasons for this decline may include hunter harvest, predation, winter severity, and habitat changes. Management actions attempting to mitigate deer population decline would require an understanding of factors influencing localized population demographics, such as rates of annual survival, rates of juvenile recruitment, cause-specific mortality, and habitat use. Furthermore, efforts to restore elk to FDL and the surrounding area (Fig. 1) are planned to begin in the near future. The potential impacts of the planned elk restoration effort on the white-tailed deer population are unknown. The presence of elk may directly or indirectly influence deer habitat use, disease dynamics, predator-prey interactions, and could subsequently alter rates of deer survival and recruitment. An understanding of how elk restoration may impact deer, and how to mitigate such impacts through management activities, requires baseline demographic data for white-tailed deer in the region prior to interaction and range overlap with elk.

**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 a multi-phase study of deer demographics to better inform management of both elk and deer populations on the FDL Reservation and surrounding areas. This proposal would support Phase I; the collection of baseline deer demographic data and habitat use prior to elk restoration. Future phases would examine any change in deer demographics and habitat use in the context of initial deer/elk interaction and eventual elk population establishment. As part of Phase I, we will capture and GPS collar 100 adult deer (50 males, 50 females) during each winter (Jan-April) of 2026 and 2027. Collars on adult deer will provide information on population survival rates, causes of mortality, movement rates, and habitat use. At the time of capture, pregnant females will be affixed with transmitters capable of detecting birth events the following summer. We will locate birth sites to affix newborn fawns with an expandable tracking collar. We will seek to collar 50-70 fawns each summer (May-July) in 2026 and 2027. We will monitor fawns for 6-12 months to determine survival rates and causes of mortality. The tracking data will be used to understand how habitat use and movement behavior impact survival for both adults and fawns.

**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 has two intended outcomes. First, demographic data for adults and fawns will inform RMD and local MN DNR deer and forest management on the FDL Reservation and the surrounding region. Second, the project provides baseline demographic data for deer not yet interacting with a restored elk population. Future research can then compare deer demographic data collected from different phases of elk restoration to quantify any changes in deer resource use or survival. Results from this project will be valuable if elk population reestablishment continues in northern Minnesota.

## Project Location

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

Ecological Subsection(s): Mille Lacs Uplands, North Shore Highlands, St. Louis Moraines,

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

Region(s): NE

**When will the work impact occur?**

During the Project and In the Future

## Activities and Milestones

**Activity 1: Collect data on annual survival, cause-specific mortality, and habitat use for adult (>1 year old) male and female white-tailed deer.**

**Activity Budget:** \$938,000

### Activity Description:

In winter (Jan-April) of both 2026 and 2027, we will capture 100 adult (>1 year old) white-tailed deer each year within the study area. Within the study area there exists a gradient of more privately-owned agricultural land to the east, with a greater proportion of state, county, and tribal forested lands in the west open to public hunting. To capture the gradient in habitat and harvest pressure, we will capture 50 adult deer (25 males, 25 females) on each the east and west portions of the study area per year. Each deer will receive a GPS collar that records a location fix every 5 hours throughout the year. At the conclusion of the study, any remaining collars will be removed from the animals via a remote break-off mechanism. We will inform hunters in the region that collared animals are available for harvest, and the presence of the collar should not influence their harvest decisions. We will analyze seasonal home range and resource selection using Brownian bridge movement models and step-selection functions. We will analyze survival rates using Cox proportional hazard models. The outcome of activity one will be demographic data used to manage adult deer habitat and harvest.

### Activity Milestones:

Description	Approximate Completion Date
Identify areas for capture activities representative of the habitat gradient in the study area.	November 30, 2025
Conduct capture efforts during winter 2026, with the goal of 100 deployed collars.	April 30, 2026
Conduct capture efforts during winter 2027, with the goal of 100 deployed collars.	April 30, 2027
Collect movement and survival data from collared deer for 1 year or until project termination.	December 31, 2027

**Activity 2: Collect data on survival/recruitment and cause-specific mortality rates for white-tailed deer fawns (0-12 months of age).**

**Activity Budget:** \$497,000

### Activity Description:

For each female captured in activity one, we will confirm pregnancy status using trans-abdominal ultrasound. Pregnant adults will be affixed with an additional transmitter unit capable of detecting birth events the following spring and summer. Researchers will locate newborn fawns (May-July) allowing for sufficient time for the fawns to initially bond and nurse, and for the doe to clean the fawns and birth site (1-2 hours). We will affix fawns with an expandable collar consisting of stitched and pleated elastic that will stretch and grow with the animal. We will remotely monitor fawns at least daily for 3 months, and at least weekly thereafter until the collar breaks off (typically 9-12 months). Following a mortality event, researchers will determine the cause (predations, starvation, disease, etc.). We will use data obtained from both the fawn and their mothers to model the relationship between landscape characteristics and the leading causes of fawn mortality.

### Activity Milestones:

Description	Approximate Completion Date
Locate 2026 birth sites via adult implant transmitters and collar approximately 70 neonate fawns.	June 30, 2026
Monitor survival and cause-specific mortality 2026 fawns for 6 months or until collar break-off.	December 31, 2026
Locate 2027 birth sites via adult implant transmitters and collar approximately 70 neonate fawns.	June 30, 2027
Monitor survival and cause-specific mortality 2027 fawns for 6 months or until collar break-off.	December 31, 2027

Activity 3: Share results with tribal and non-tribal publics, MDNR, county land departments, FDL natural resource advisory committees, and Reservation Business Committee.

**Activity Budget:** \$6,000

**Activity Description:**

As a fully collaborative effort between Bemidji State University and the Fond du Lac Band of Lake Superior Chippewa, project partners will openly communicate with each other and the public. Researchers from Bemidji State University and RMD staff will provide written or oral reports on project methodology, results, and plans with FDL natural resource advisory committees and the Reservation Business Committee at least annually, but as frequently as required. Furthermore, FDL will provide input and final approval for the dissemination of research results and specific management implications. Research findings will be shared to the tribal and non-tribal publics through local or regional media outlets. More technical results and management recommendations will be shared to the broader scientific community via graduate student theses, conference presentations, and peer-reviewed publications.

**Activity Milestones:**

Description	Approximate Completion Date
Share updates with FDL tribal council at least annually via oral or written reports.	December 31, 2027
Share results with the public through community presentations, webinars, and media outlets.	December 31, 2027
Share results with the broader scientific community through student theses, publications, and conference presentations.	December 31, 2027

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Mike Schrage	Fond du Lac Resource Management Division	Mike Schrage is the wildlife biologist for the FDL Band's Resource Management Division (RMD). Mike will serve as a co-investigator on the project, and RMD staff will assist with fieldwork. Mike has past research experience with wood turtles, black bears and moose, and currently leads wolf research on the Reservation.	Yes

## 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.**

Researchers from Bemidji State University and RMD staff will provide written or oral reports on project methodology, results, and plans with FDL natural resource advisory committees and the Reservation Business Committee at least annually, but as frequently as required. Furthermore, FDL will provide input and final approval for the dissemination of research results and specific management implications. Research findings will be shared to the tribal and non-tribal publics through local or regional media outlets, including land cover maps when appropriate. More technical results and management recommendations will be shared to the broader scientific community via graduate student theses, conference presentations, and peer-reviewed publications. We will acknowledge the Environment and Natural Resources Trust Fund through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications and outreach.

## 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?**

The results will better inform tribal and non-tribal wildlife and forest managers and their publics how to more effectively manage northeast Minnesota forests and deer populations, while also examining how the local deer herd responds to the restoration of elk to the region. The proposed project will be the first of multiple phases; an assessment of deer survival and resource use prior to (phase I), during (phase II), and after (phase III) elk reestablishment on the Reservation. We will seek continued LCCMR support to fund work in future phases during the 2027 and 2029 funding cycles.

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
BSU Research Technicians		5x research technicians to assist graduate student with deer capture and monitoring (9 months/year at \$24/hr)			0%	7		\$374,400
Graduate Research Assistants		Data collection, analysis, writing (1 student for 2.5 years, 1 student for 1.5 years). Tuition remission and student fees included.			36.6%	4		\$163,910
Haus Principal Investigator		Manage, analyze data, write, outreach; 0.2 FTE/year			22%	0.4		\$35,837
							<b>Sub Total</b>	<b>\$574,147</b>
<b>Contracts and Services</b>								
GPS collar manufacturer	Service Contract	Deployed GPS collars require a monthly service fee with the manufacturer to receive data. \$30/month for each deployed collar.				0		\$72,000
Fond du Lac Resource Management Division	Subaward	2x existing FDL employees with up to 250 hours each of field support/year. Mileage reimbursement for FDL employees using FDL vehicles (trucks, snowmobiles) to assist with project activities (4000 miles @ \$0.67/mile). FDL employees will assist with deer capture, mortality investigations, and survival monitoring,				0.24		\$45,280
University of Minnesota; Cloquet Forestry Center	Service Contract	House/ storage space lease agreement for field equipment and technicians working on the project (800/month for 30 months). Cabins are available to rent as a discrete service according to a published fee schedule.				2.5		\$24,000
							<b>Sub Total</b>	<b>\$141,280</b>
<b>Equipment, Tools, and Supplies</b>								
	Equipment	GPS collars (200x) at \$2500 per unit	Collars to collect data on adult deer movement and survival					\$500,000

	Equipment	VIT transmitters (100x) at \$400 per unit	Transmitters to detect birth events in adult females, collar fawns					\$40,000
	Equipment	Neonate fawn collars (120x) at \$400 per unit	Collars to collect data on neonate deer movement and survival					\$48,000
	Equipment	Telemetry receivers (3) and antennas (4)	Equipment used to track and relocate GPS collars					\$2,100
	Equipment	Drop nets (3x) at \$4250 per	Nets used to capture multiple deer					\$12,750
	Equipment	Clover traps (10x) at \$1100 per	Traps used to capture single deer					\$11,000
	Tools and Supplies	Pharmaceuticals for deer capture (\$110/deer)	Drugs used to immobilize adult deer during capture and handling					\$22,000
	Tools and Supplies	Miscellaneous capture supplies (syringes, needles, ear tags, tag applicators, toolboxes, etc.)	Supplies to safely process captured deer					\$13,473
	Tools and Supplies	Bulk shelled corn (4000 lbs)	Corn used to bait traps for deer capture					\$2,000
							<b>Sub Total</b>	<b>\$651,323</b>
<b>Capital Expenditures</b>								
		1x used 4x4 pick-up truck	Truck used to transport field equipment and technicians during deer capture and monitoring	X				\$27,500
		1x used 4x4 pick-up truck	Truck used to transport field equipment and technicians during deer capture and monitoring	X				\$27,500
							<b>Sub Total</b>	<b>\$55,000</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Travel In Minnesota</b>								
	Other	Gasoline reimbursment for field travel (vehicles)	Travel during field research activities; trucks, snowmobiles, ATV. (60,000 miles @ 16mpg and \$3.00/ga)					\$11,250
	Conference Registration Miles/ Meals/ Lodging	Registration, travel, lodging, and food for 2 people to attend 2 professional conferences	Travel for graduate students to attend 2 conferences in Minnesota and present results of research					\$6,000
							<b>Sub Total</b>	<b>\$17,250</b>



<b>Travel Outside Minnesota</b>								
	Conference Registration Miles/ Meals/ Lodging	Registration, travel, lodging, and food for 1 person to attend 1 professional conference out of state	Travel for graduate students to attend 2 conferences in Minnesota and present results of research	X				\$2,000
							<b>Sub Total</b>	<b>\$2,000</b>
<b>Printing and Publication</b>								
							<b>Sub Total</b>	-
<b>Other Expenses</b>								
							<b>Sub Total</b>	-
							<b>Grand Total</b>	<b>\$1,441,000</b>

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Capital Expenditures</b>		1x used 4x4 pick-up truck	Research of this type cannot be completed without extensive use of field vehicles, which are not readily available through existing means with either BSU or Fond du Lac. Please see attached vehicle cost comparison. <b>Additional Explanation :</b> Vehicles will be used explicitly for field work associated with deer capture and monitoring throughout the duration of the project. We plan to submit LCCMR proposals to fund future phases of the project, and the vehicles would continue to be used explicitly on the Fond du Lac deer and elk projects.
<b>Capital Expenditures</b>		1x used 4x4 pick-up truck	Research of this type cannot be completed without extensive use of field vehicles, which are not readily available through existing means with either BSU or Fond du Lac. Please see attached vehicle cost comparison. <b>Additional Explanation :</b> Vehicles will be used explicitly for field work associated with deer capture and monitoring throughout the duration of the project. We plan to submit LCCMR proposals to fund future phases of the project, and the vehicles would continue to be used explicitly on the Fond du Lac deer and elk projects.
<b>Travel Outside Minnesota</b>	Conference Registration Miles/Meals/Lodging	Registration, travel, lodging, and food for 1 person to attend 1 professional conference out of state	The main outlet to disseminate results of scientific wildlife research for graduate students is the national meeting of The Wildlife Society. Although out-of-state, it is the primary source for preliminary research results for Minnesota stakeholders as well as the broader scientific community.

## Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
<b>State</b>				
In-Kind	BSU owned equipment	Use of equipment already owned by BSU Wildlife Program (Polaris ATV, utility trailer, 10x Clover traps, 5x drop nets, 30x trail cameras, misc. capture equipment, telemetry equipment, etc.).	Secured	\$74,650
In-Kind	Bemidji State University Biology Department	Vehicle maintenance/repair and general vehicle expenses (\$5,000/year/vehicle)	Secured	\$25,000
In-Kind	BSU Biology Department	2x snowmobile and 1x utility trailer. Snowmobiles used to check deer traps during winter capture	Secured	\$12,000
			<b>State Sub Total</b>	<b>\$111,650</b>
<b>Non-State</b>				
In-Kind	FDL owned equipment	Equipment already owned by FDL (snowmobiles, trailer, trail cameras)	Secured	\$10,000
In-Kind	FDL Staff salary in-kind	0.2 FTE for FDL supervising wildlife biologist Mike Schrage (project coordination, outreach)	Secured	\$30,000
			<b>Non State Sub Total</b>	<b>\$40,000</b>
			<b>Funds Total</b>	<b>\$151,650</b>

**Total Project Cost: \$1,592,650**

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

Yes

## Attachments

### Required Attachments

#### *Visual Component*

File: [382b2511-3f0.docx](#)

#### *Alternate Text for Visual Component*

Figure 1. A map showing a potential deer project study site that encompasses the entire Fond du Lac Reservation and areas to the north and west included in the proposed elk restoration area....

### Supplemental Attachments

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

Title	File
Minnesota State Annual Financial Report - 2023	<a href="#">47cb1436-024.pdf</a>
Signed Resolution from FDL	<a href="#">428ddbde-037.pdf</a>
Support Letter - Rocky Mountain Elk Foundation	<a href="#">cb253df7-067.pdf</a>
Support Letter - Izaak Walton League of America	<a href="#">2c9dd21a-e35.pdf</a>
Support Letter - Minnesota Conservation Federation	<a href="#">0439ce04-524.pdf</a>
2025-009 Research Addendum revised final	<a href="#">3d059099-79a.docx</a>
Vehicle purchase questionnaire	<a href="#">7828d1d6-b5a.docx</a>

### Difference between Proposal and Work Plan

#### *Describe changes from Proposal to Work Plan Stage*

None

## 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?**

Yes

**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 project:**

-Jenna Trisko (BSU Pre-Award Grant Administrator; Grants@bemidjistate.edu)

-Katelyn Pearlson (BSU Financial Reporting Specialist; katelyn.pearlson@bemidjistate.edu)

**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