



## Environment and Natural Resources Trust Fund

M.L. 2022 Approved Work Plan

### General Information

**ID Number:** 2022-149

**Staff Lead:** Corrie Layfield

**Date this document submitted to LCCMR:** June 21, 2022

**Project Title:** Offal Wildlife Watching: How Do Hunters Provision Scavengers?

**Project Budget:** \$473,000

### Project Manager Information

**Name:** Joseph Bump

**Organization:** U of MN - College of Food, Agricultural and Natural Resource Sciences

**Office Telephone:** (612) 624-2255

**Email:** bump@umn.edu

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### Project Reporting

**Date Work Plan Approved by LCCMR:** June 27, 2022

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

**Project Completion:** June 30, 2025

**Final Report Due Date:** August 14, 2025

### Legal Information

**Legal Citation:** M.L. 2022, Chp. 94, Art. , Sec. 2, Subd. 03g

**Appropriation Language:** \$473,000 the second year is from the trust fund to the Board of Regents of the University of Minnesota to recruit hunters statewide and use remote cameras at field-dressed deer gut piles to study the impacts of these offal resources on scavengers and other wildlife.

**Appropriation End Date:** June 30, 2025

## Narrative

**Project Summary:** This is a citizen-science project driven by hunters. We'll recruit hunters statewide and provide remote cameras to deploy at field-dressed deer gut piles to study scavengers, hunter provisioning, and CWD.

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

There's a tremendous opportunity for Minnesota deer hunters to help collect data about scavenger species that consume what successful hunters leave behind in the field. Every year hunters harvest ~200,000 deer across the state and almost all hunters field-dress their deer immediately, i.e. they remove the internal organs, or offal, from the deer to cool the carcass down quickly to avoid spoiling. Virtually all offal is left in the field, resulting in more than 4-million pounds of nutritious resources that are consumed by numerous wildlife species.

Yet, there are no Minnesota data on scavenger dynamics at hunter-provided deer offal. How many species use deer offal? Which species use offal the most? How long does offal last on the landscape? Are there risks to specific scavenger species, such as bald eagles, that involve consumption of contaminants? Are there potential disease exposure and transmission issues, such as chronic wasting disease? Do answers to these questions vary across biomes from the boreal northeast to the farms and prairies of the southwest?

Answers to these questions will inform wildlife monitoring and management statewide. And our solution to the problem will enlist those perfectly suited to help solve the problem - hunters.

**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 seek funding to develop a statewide citizen science program that will address this knowledge gap by recruiting and providing remote cameras to hunters to deploy at their field-dressed deer offal piles. There is no other way to efficiently collect sufficient images statewide other than working with hunters. Images will then be gathered from hunters, archived, and analyzed to address management questions.

We have already piloted this program over three hunting seasons, during which we recruited ~280 hunters that were eager to help. Images were gathered from ~140 hunters that harvested deer, thereby demonstrating a successful approach. Yet, hunter participation is lower than what is needed and our spatial coverage across the state is inadequate.

Minnesota has distinct biomes and variable human densities that range from wilderness to a major metropolitan area. Deer hunting occurs in each of these areas and as a result, hunter provided offal is made available to scavengers across the state. We will develop a program to manage volunteer recruitment, training, data collection and storage, assessment of key questions, and outreach.

Partners: Minnesota Master Naturalist Program, Minnesota 4-H, Minnesota Deer Hunters Association, Backcountry Hunters & Anglers, Bluffland Whitetails Association, Minnesota Center for Prion Research and Outreach.

**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 has two main outcomes: 1) producing data that fill a knowledge gap needed for better wildlife protection and preservation (including potential exposure to contaminants/disease), and 2) creating a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. This project will result in a comprehensive understanding of scavenger at hunter provided offal. With the significant added increase in cameras and participants, we will be able to generate statewide data to capture variation in scavenger responses. With this information, we can better understand the benefits and potential risks of offal resources for scavengers.

## 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

## Activities and Milestones

### Activity 1: Recruit statewide and train volunteer hunters to participate in the Offal Wildlife Watching project.

**Activity Budget:** \$130,000

**Activity Description:**

The objective of this activity is to attract, inform, and enlist the help of volunteer hunters to participate in the Offal Wildlife Watching project statewide. To accomplish this objective we will facilitate volunteer recruitment and training through well designed events and resources. This will involve tasks such as traveling statewide to diverse groups including the Minnesota Master Naturalists Program, Minnesota Deer Hunters Association, Minnesota Backcountry Hunters and Anglers, Bluffland Whitetails Association, 4-H, Tribal Nations, and The Wildlife Society. We will also expand our social media presence and design informative media and handouts related to project recruitment. As an outcome, we have a goal of doubling our annual participation to ~400 and increasing our spatial coverage to better represent all of Minnesota's habitats.

If we do not reach our hunter recruitment goal the first year, then we will consider incentivizing participation in other ways. Nonetheless, even with a current level of participation, we will be able to address the project's questions in a robust and defensible manner.

**Activity Milestones:**

Description	Approximate Completion Date
Master Naturalist Advanced Training	August 31, 2022
Recruit and train 250 volunteers for 2022 hunting season	November 30, 2022
Master Naturalist Advanced Training	August 31, 2023
Recruit and train 250 volunteers for 2023 hunting season	November 30, 2023

### Activity 2: Image data collection via hunter deployed remote camera traps at deer offal piles, followed by data entry, archive, and analysis.

**Activity Budget:** \$292,000

**Activity Description:**

The first objective of this activity is to work with hunter volunteers to collect images via deployed remote camera traps at deer offal piles. Once images have been recorded, our next objective is to gather images from hunters, back them up and archive copies, enter individual hunter site data, and analyze images to answer key management questions such as: How many species use deer offal? Which species use offal the most? How long does offal last on the landscape?

To accomplish these objectives, we will have remote camera kits to share with hunters that need them. Images will be collected from hunters remotely online, via mail, and in person. Data will be backed up and archived in two ways: with external hard drives and high density storage at the University of Minnesota's Supercomputing Institute. A postdoctoral researcher with extensive experience with the project will be 100% dedicated to data analysis.

To help shed light on the potential contaminant exposure risks, we will construct adverse outcome pathways for species of interest. With support from MNPRO, we will also be able to identify disease exposure risk, e.g. CWD, using tools such as social network analysis.

**Activity Milestones:**

Description	Approximate Completion Date
Order, program, and prepare 500 remote camera trapping kits	September 30, 2022
Image data collecting from hunters 2022	February 28, 2023
Image backup and archive 2023	March 31, 2023
Image data collecting from hunters 2023	February 28, 2024
Image backup and archive 2023	March 31, 2024
Data analysis and summary (ongoing)	June 30, 2024

**Activity 3: Dissemination of results and public outreach via social media, presentations, publications, and popular articles.**

**Activity Budget:** \$51,000

**Activity Description:**

The objective of this activity is to share project results with hunter volunteers and disseminate information to the public. To accomplish this objective we will prepare popular and scientific presentations that will be given to participating groups and hunters. We will prepare popular articles such as those featured in the Minnesota Conservation Volunteer and manuscripts for publication in peer-reviewed journals. We will create content for social media outlets and training for Minnesota Master Naturalist and other groups engaged with Minnesota natural resources stewardship.

**Activity Milestones:**

Description	Approximate Completion Date
Present at the 2022 Minnesota Chapter of The Wildlife Society meeting	February 28, 2023
Present at the 2023 Minnesota Chapter of The Wildlife Society meeting	February 28, 2024
Present at 2023 Minnesota Master Naturalist Gathering Partners conference	May 31, 2024
Present at 2024 Minnesota Master Naturalist Gathering Partners conference	June 30, 2024
Present for the Minnesota Deer Hunters Association	June 30, 2024

## Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
John Loegering (or alternate at UMN Extension)	University of Minnesota	Extension Program Leader focused on forestry, fisheries and wildlife programming and outreach who will supervise hunter recruitment and training efforts.	Yes
Amy Rager (or alternate at UMN extension)	University of Minnesota	Extension Program Leader focused on forestry, fisheries and wildlife programming, and outreach. Ms. Rager will assist in hunter recruitment and training efforts, and outreach efforts especially among members of the Minnesota Master Naturalist program.	Yes
Craig Engwall	Minnesota Deer Hunters Association (MDHA)	Lead liaison with MDHA. Mr. Engwall is the Executive Director of the Minnesota Deer Hunters Association (MDHA)	No
Nicole Pokorney	University of Minnesota	Lead liaison with Minnesota 4-H. Ms. Pokorney is an Extension educator with Center for Youth Development.	No
Matthew Lee	Minnesota chapter of Backcountry Hunters and Anglers (BHA)	Lead liaison with the Minnesota chapter of BHA. Mr. Lee is the BHA Minnesota chapter chair.	No
Taylor Bestor	Bluffland Whitetails Association	Lead liaison with Bluffland Whitetails Association. Mr. Bestor is the President of Bluffland Whitetails association.	No
Dr. Tiffany Wolf and Dr. Peter Larsen	Minnesota Center for Prion Research and Outreach	To explore ways in which hunter collaboration may be leveraged for Chronic Wasting Disease research (CWD) and to support additional opportunities it may offer to advance CWD research.	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.**

Project results will be disseminated through popular press articles, peer-reviewed papers, professional presentations, and social media. Our goal is to develop this program into a long-term University of Minnesota Extension program that not only continues to engage hunters in the Offal Wildlife Watching project, but expands the program to bear hunter bait piles and hunter surveys as well. A point of expansion would be to assess why some hunters are currently choosing to participate while others do not, which may better allow us to engage more hunters. Such an ongoing effort would likely involve a phase two funding proposal submitted ENRTF and University of Minnesota support.

This project 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 per the ENRTF Acknowledgment Guidelines.

## 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 goal is to develop this program into a long-term University of Minnesota Extension program that not only continues

to engage hunters in the Offal Wildlife Watching project, but expands the program to bear hunter bait piles and hunter surveys as well. A point of expansion would be to assess why some hunters are currently choosing to participate while others do not, which may better allow us to engage more hunters. Such an ongoing effort would likely involve a phase two funding proposal submitted ENRTF and University of Minnesota support. We'll collaborate with the Minnesota Center for Prion Research long-term.

### Other ENRTF Appropriations Awarded in the Last Six Years

Name	Appropriation	Amount Awarded
Mapping Aquatic Habitats for Moose	M.L. 2019, First Special Session, Chp. 4, Art. 2, Sec. 2, Subd. 03l	\$199,000

## Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	\$ Amount
<b>Personnel</b>								
Principle Investigator		Responsible for overall project management and supervision of project post-doctoral researcher.			36.5%	0.16		\$30,180
Co-Principle Investigator and Project Postdoctoral Researcher		Leads data collection, management, and analyses required to achieve project Activities. Leads peer-reviewed manuscripts and professional presentations. Leads public outreach and broader impacts with media.			25.4%	2		\$150,480
Extension Program Leader		Responsible for overall project management within the Minnesota Master Naturalist Program.			36.5%	0.1		\$11,226
Extension Educator		Co-leads project Activities within the Minnesota Master Naturalist Program.			36.5%	0.1		\$10,508
Extension Program Associate		Leads hunter recruitment, training, and coordination. Manages camera inventory and data acquisition.			31.8%	1.6		\$106,098
							<b>Sub Total</b>	<b>\$308,492</b>
<b>Contracts and Services</b>								
University of Minnesota Supercomputing Institute	Internal services or fees (uncommon)	The University of Minnesota Supercomputing Institute will provide high density data storage and backup for the hundreds of thousands of images and videos that project Activities will generate. The Institute will also provide data management consulting.				0.2		\$4,000
							<b>Sub Total</b>	<b>\$4,000</b>
<b>Equipment, Tools, and Supplies</b>								
	Equipment	275 remote camera kits: camera, security case, cable lock, mount, batteries, memory cards @ \$400 ea.	Needed to capture high definition images and video of wildlife at offal sites across Minnesota.					\$110,000
	Tools and Supplies	10 external hard drives: 8TB drives that are portable @ \$150 each	Mobil data storage capacity for field, lab, and office data maintenance and analysis.					\$1,500



							<b>Sub Total</b>	<b>\$111,500</b>
<b>Capital Expenditures</b>								
		4 digital SLR camera kits: single lens reflex camera arrays with triggers, flashes, and 4K video capacity to generate high quality materials for outreach @ \$6000 each.	Needed to generate 4K video for highest quality animal behavior interpretation and audio visual material for public outreach and social media.	X				\$24,000
							<b>Sub Total</b>	<b>\$24,000</b>
<b>Acquisitions and Stewardship</b>								
							<b>Sub Total</b>	<b>-</b>
<b>Travel In Minnesota</b>								
	Miles/ Meals/ Lodging	1 vehicle rental for 2 years at 10,000 miles of travel @ \$0.56 per mile = 5,600).	Needed for hunter recruitment, training, remote camera workshops & delivery, data recovery, public outreach, and project presentations.					\$5,600
							<b>Sub Total</b>	<b>\$5,600</b>
<b>Travel Outside Minnesota</b>								
	Conference Registration Miles/ Meals/ Lodging	Travel support for PI and Co-PI to attend one professional meeting each year for 2 years.	Needed for presentation of project methods, results, and implications at relevant professional meetings. For example, Annual meeting of The Wildlife Society.	X				\$4,000
							<b>Sub Total</b>	<b>\$4,000</b>
<b>Printing and Publication</b>								
	Publication	Publication page chargers for peer-reviewed journals: 3 per year @ \$2000/article for 2 years	Needed to pay for publication of project related science articles					\$12,000
	Printing	Hunter recruitment flyers and announcements in print media	Needed to broadly recruit hunters to participants in project Activities.					\$1,608
							<b>Sub Total</b>	<b>\$13,608</b>
<b>Other Expenses</b>								

		Postage	Needed to mail camera kits and memory cards to and from hunter volunteers to distribute supplies and collect data.					\$1,800
							<b>Sub Total</b>	<b>\$1,800</b>
							<b>Grand Total</b>	<b>\$473,000</b>

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Capital Expenditures</b>		4 digital SLR camera kits: single lens reflex camera arrays with triggers, flashes, and 4K video capacity to generate high quality materials for outreach @ \$6000 each.	Needed to meet outreach and broader impact goals. <b>Additional Explanation :</b> I am unsure these cameras are capital expenditures because each camera is a list of equipment that we build into a camera kit. No matter the category, each camera kit will be used for the same program through their useful functioning.
<b>Travel Outside Minnesota</b>	Conference Registration Miles/Meals/Lodging	Travel support for PI and Co-PI to attend one professional meeting each year for 2 years.	Needed to disseminate project methods, results, and implications at relevant professional meetings that are held nationally. For example, Annual meeting of The Wildlife Society. This will broaden the impact of this project to a national audience and raise the profile of the ENRTF on the national stage.

Non ENRTF Funds

Category	Specific Source	Use	Status	\$ Amount
<b>State</b>				
In-Kind	Un-recovered indirect costs (55% MTDC)	University of Minnesota resources used to support this project.	Secured	\$290,000
			<b>State Sub Total</b>	<b>\$290,000</b>
<b>Non-State</b>				
			<b>Non State Sub Total</b>	-
			<b>Funds Total</b>	<b>\$290,000</b>

## Attachments

### Required Attachments

#### *Visual Component*

File: [a5c7f446-b77.pdf](#)

#### *Alternate Text for Visual Component*

This is a citizen-science project driven by hunters. We will recruit hunters statewide and provide remote cameras to deploy at field-dressed deer gut piles to study scavengers and hunter provisioning. The visual illustrates that this project will:

- Advance knowledge about scavenger communities at hunter provided gut piles.
- Better understand the potential for wildlife disease spread and contaminant exposure.
- Statewide hunter participation across Minnesota biomes and human densities.
- Man...

### Optional Attachments

#### *Support Letter or Other*

Title	File
Letter of support and collaboration from Minnesota Center for Prion Research and Outreach (MNPRO)	<a href="#">5802dac2-7e6.pdf</a>
Letter of support and collaboration from Minnesota Dear Hunters Association (MDHA)	<a href="#">86d01782-a2b.pdf</a>
Letter of support and collaboration from Bluffland Whitetails Association	<a href="#">ad0d5602-4ff.pdf</a>
Letter of support and collaboration from Back Country Hunters and Anglers	<a href="#">0463ba4f-738.pdf</a>
Letter of support and collaboration from Minnesota 4-H	<a href="#">90e49005-562.pdf</a>
UMN approval letter to submit	<a href="#">afb76ce9-1c2.pdf</a>
Background check form	<a href="#">accefbdb-e29.pdf</a>
Bump 2022-149 Revised work plan APPROVED	<a href="#">388a7f7c-436.pdf</a>

## Difference between Proposal and Work Plan

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

Given the award amount, the number of remote camera kits to be purchased was decreased from 500 to 275.

## 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 agree travel expenses must 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 agree to the UMN Policy.

**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



## How Do Hunters Provision Scavengers?

*Recruiting hunters statewide to provide remote cameras to deploy at field-dressed deer gut piles (offal) to study scavengers and hunter provisioning:*

Opportunity & Management Need:

Hunters as Citizen Scientists:

Project Outcomes:

- Advance knowledge about scavenger communities at hunter provided gut piles.
- Better understand the potential for wildlife disease spread and contaminant exposure.
- Statewide hunter participation across Minnesota biomes and human densities.
- Manage volunteer recruitment, training, collection and management of the data.
- Data that fill a knowledge gap needed for better wildlife management and protection
- Creation of a novel program for hunter participation in citizen science.

*Photos from 2 years of pilot research >> proven approach for success.*



