

# Final Abstract

Final Report Approved on January 9, 2026

## M.L. 2022 Project Abstract

For the Period Ending June 30, 2025

**Project Title:** Offal Wildlife Watching: How Do Hunters' Provisions Impact Scavengers?

**Project Manager:** Joseph Bump

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

**Mailing Address:** 135 Skok Hall 2003 Upper Buford Circle

**City/State/Zip:** Saint Paul, MN 55108

**Phone:** (612) 624-2255

**E-mail:** bump@umn.edu

**Website:** <https://cfans.umn.edu/>

**Funding Source:**

**Fiscal Year:**

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

**Appropriation Amount:** \$473,000

**Amount Spent:** \$454,681

**Amount Remaining:** \$18,319

### Sound bite of Project Outcomes and Results

The project showed that properly managed hunter-provided offal supports scavenger species, enhances nutrient cycling, and reduces waste without harming ecosystems. Findings describe how hunters can participate in science that enhances the understanding of Minnesota's wildlife across all state biomes, including potential disease exposure and contaminant risk.

### Overall Project Outcome and Results

Offal Wildlife Watching: How Do Hunters' Provisions Impact Scavengers explored what happens when hunters leave behind deer offal (remains such as organs and bones) in the landscape after harvest. In Minnesota, tens of thousands of deer are harvested each year, creating a large but poorly understood food source for wild scavengers. Managers and hunters have long wondered whether this practice helps wildlife, harms ecosystems, or affects disease spread. The project's goal was to better understand this opportunity and concern by observing which and how scavenger species use offal piles and how use may change with the surrounding environment. Hunters placed motion-activated trail cameras at hundreds of offal sites statewide and monitored which animals visited, how often, and for how long. This allowed wildlife to be studied without disturbance across biomes. We have collected and analyzed hundreds of thousands of

images of scavengers at deer gut piles.

The project documented dozens of wildlife species using offal, including eagles, hawks, ravens, coyotes, foxes, and other native scavengers. Results showed that offal provides an important seasonal food source, especially in late fall and early winter, when natural food is limited. Scavengers quickly consumed most offal, reducing waste and returning nutrients to the soil. Bird species, especially raptors and crows take advantage of offal (Candler et al. 2025). We observed barred owls and bobcats both scavenging opportunistically at some gut piles and preying on rodents that were also attracted to the gut pile.(Candler et al. 2023).

Outcomes from the project support hunter participation in wildlife science and conservation. Overall, the project provides practical, science-based information for wildlife managers and hunters. Its findings help guide hunting regulations, disease-risk discussions, and conservation education efforts. By improving understanding of scavenger behavior and ecosystem connections, the project contributes to protecting and enhancing Minnesota's wildlife and land.

### **Project Results Use and Dissemination**

We curated a social media following (Facebook, Instagram and X) and our website ([offal.umn.edu](http://offal.umn.edu)) serves as a hub for participant resources, project updates and results.

We distributed project newsletters (~13) to a list of about 600 participants and stakeholders (see attachments). We completed over 50 outreach events and presentations throughout the state. These include but are not limited to: meeting with hunting groups, attending 4H events and webinars, outreach booths at the state fair and wildlife events, & ecological conferences. At least nine media stories occurred, including Minnesota Public Radio and Star Tribune stories. At least two peer-reviewed publications.



## Environment and Natural Resources Trust Fund

M.L. 2022 Approved Final Report

### General Information

**Date:** February 2, 2026

**ID Number:** 2022-149

**Staff Lead:** Mike Campana

**Project Title:** Offal Wildlife Watching: How Do Hunters' Provisions Impact 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

**Web Address:** <https://cfans.umn.edu/>

### Project Reporting

**Final Report Approved:** January 9, 2026

**Reporting Status:** Project Completed & Additional Update Approved

**Date of Last Action:** January 9, 2026

**Project Completion:** June 30, 2025

### Legal Information

**Legal Citation:** M.L. 2022, Chp. 94, 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	\$ Amount Spent	\$ Amount Remaining
<b>Personnel</b>										
Principle Investigator		Responsible for overall project management and supervision of project post-doctoral researcher.			36.5%	0.32		\$74,878	-	-
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%	1.5		\$134,221	-	-
Extension Program Leader		Responsible for overall project management within the Minnesota Master Naturalist Program.			36.5%	0.1		-	-	-
Extension Educator		Co-leads project Activities within the Minnesota Master Naturalist Program.			36.5%	0.1		\$26,809	-	-
Extension Program Associate		Leads hunter recruitment, training, and coordination. Manages camera inventory and data acquisition.			31.8%	1.6		\$152,234	-	-
							<b>Sub Total</b>	<b>\$388,142</b>	<b>\$369,823</b>	<b>\$18,319</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		-	-	-
							<b>Sub Total</b>	-	-	-
<b>Equipment, Tools, and Supplies</b>										

	Equipment	Approximately 175 remote camera kits: camera, security case, cable lock, mount, batteries, memory cards @ \$305 ea.	Needed to capture high definition images and video of wildlife at offal sites across Minnesota.					\$53,436	\$53,436	-
	Capital Equipment	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				\$13,102	\$13,102	-
	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.					\$2,639	\$2,639	-
							<b>Sub Total</b>	<b>\$69,177</b>	<b>\$69,177</b>	-
<b>Capital Expenditures</b>										
							<b>Sub Total</b>	-	-	-
<b>Acquisitions and Stewardship</b>										
							<b>Sub Total</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	\$5,600	-
							<b>Sub Total</b>	<b>\$5,600</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				\$4,192	\$4,192	-

							<b>Sub Total</b>	<b>\$4,192</b>	<b>\$4,192</b>	<b>-</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					\$3,200	\$3,200	-
	Printing	Hunter recruitment flyers and announcements in print media	Needed to broadly recruit hunters to participants in project Activities.					\$889	\$889	-
							<b>Sub Total</b>	<b>\$4,089</b>	<b>\$4,089</b>	<b>-</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	\$1,800	-
							<b>Sub Total</b>	<b>\$1,800</b>	<b>\$1,800</b>	<b>-</b>
							<b>Grand Total</b>	<b>\$473,000</b>	<b>\$454,681</b>	<b>\$18,319</b>

## Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request
<b>Equipment, Tools, and Supplies</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	\$ Amount Spent	\$ Amount Remaining
<b>State</b>						
In-Kind	Un-recovered indirect costs (55% MTDC)	University of Minnesota resources used to support this project.	Secured	\$290,000	\$290,000	-
			<b>State Sub Total</b>	<b>\$290,000</b>	<b>\$290,000</b>	<b>-</b>
<b>Non-State</b>						
			<b>Non State Sub Total</b>	<b>-</b>	<b>-</b>	<b>-</b>
			<b>Funds Total</b>	<b>\$290,000</b>	<b>\$290,000</b>	<b>-</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...

### Supplemental Attachments

#### *Capital Project Questionnaire, Budget Supplements, Support Letter, Photos, Media, 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 Deer 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>
Offal Wildlife Watching: connecting hunters, wildlife researchers, Offal Wildlife Watching: connecting hunters, wildlife researchers, and the public through participatory science and the public through participatory science	<a href="#">512386ae-0af.pdf</a>
Cascading carrion: Opportunistic predation at deer gut piles	<a href="#">f35f76c3-091.pdf</a>
OWW documented species list	<a href="#">0dd7ec2e-e4e.pdf</a>
2025 Project Info Outreach Flyer	<a href="#">a686a952-332.pdf</a>
2023 Camera Trap History and Techniques workshop	<a href="#">9c784362-32b.pdf</a>
Workshop1	<a href="#">eb03092f-1c6.jpe</a>
Workshop2	<a href="#">fe5254a0-d08.jpe</a>
Workshop3	<a href="#">1395558f-e1d.jpe</a>
2025 Aitkin County Natural Resources Advisory Committee	<a href="#">38602719-898.pdf</a>
2024 Rice Lake NWR presentation	<a href="#">e3f509e3-aeb.pdf</a>
2024 Minnesota Governor's Deer Hunting Opener	<a href="#">251eb893-02a.pdf</a>
2024 Midwest Fish and Wildlife Conference_Milanowski	<a href="#">46badc28-856.pdf</a>
2024 Midwest Fish and Wildlife conference_Candler	<a href="#">b61d6d04-7ea.pdf</a>
2024 Extension Forestry_Using Remote Cameras webinar	<a href="#">15d7b19e-1af.pdf</a>
2024 Extension Forestry_Fridays with a Forester webinar	<a href="#">32f2a7bd-519.pdf</a>
2024 4H Wildlife Wednesday webinar	<a href="#">a2528a11-199.pdf</a>
2023 Ecological Society of America conference_Candler	<a href="#">fd04348a-9c3.pdf</a>
2023 Duluth Archery Club presentation	<a href="#">006ea06b-9d4.pptx</a>
2023 Duluth Archery Club presentation	<a href="#">9213b61b-b6d.pptx</a>

2020 Gathering Partners poster	<a href="#">1fa7e44c-5be.pdf</a>
2023_5 May newsletter.pdf	<a href="#">d0719896-9b7.pdf</a>
2023_8 Aug newsletter	<a href="#">b79bcd15-380.pdf</a>
2023_9 Sep newsletter	<a href="#">515a2cf1-81e.pdf</a>
2023_11 Nov newsletter	<a href="#">0330f7c7-632.pdf</a>
2024_2 Feb newsletter	<a href="#">eac421ea-589.pdf</a>
2024_4 April newsletter	<a href="#">b5ff837c-2c1.pdf</a>
2024_7 July newsletter	<a href="#">5ee341c0-647.pdf</a>
2024_8 Aug newsletter	<a href="#">dfa14aee-54d.pdf</a>
2024_10 Oct newsletter	<a href="#">e67f9cb3-9db.pdf</a>
2025_2 Feb newsletter	<a href="#">7f20402a-41a.pdf</a>
2025_7 July newsletter	<a href="#">69fb772e-6e5.pdf</a>
2025_4 April newsletter	<a href="#">18cd3534-69d.pdf</a>
OWW final report graphs	<a href="#">25e5a094-1aa.pdf</a>
OWW MN TWS Poster	<a href="#">9ba6cf64-8a5.pdf</a>
Outreach/Events Tracking	<a href="#">44b2b9af-a3c.xlsx</a>
August 2023 Press Release	<a href="#">647dda7-fd6.pdf</a>
May 2023 Ely Echo article	<a href="#">a95d86fd-5b0.pdf</a>
Nov 2024 Northern Wilds magazine	<a href="#">d72c2f09-82e.pdf</a>
Oct 2023 MPR article	<a href="#">422ee037-bfb.pdf</a>
Oct 2023 Star Tribune article	<a href="#">120fe76e-e49.pdf</a>
Oct 2023 West Central Tribune article	<a href="#">a41509cf-77a.pdf</a>
Oct 2024 Talking Participatory Science with U of M	<a href="#">53385a83-c09.pdf</a>
OWW Podcasts appearances	<a href="#">af630cad-9ac.pdf</a>
Sep 2023 Boreal.org article	<a href="#">a04c039a-051.pdf</a>
Sep 2023 MN Brown Blog article	<a href="#">7d7f1b5d-e7e.pdf</a>

### Media Links

Title	Link
Offal Wildlife Watching (Zooniverse)	<a href="https://www.zooniverse.org/projects/embeller/offal-wildlife-watching">https://www.zooniverse.org/projects/embeller/offal-wildlife-watching</a>
Offal Wildlife Watching (UMN)	<a href="https://offal.umn.edu/">https://offal.umn.edu/</a>
Offal Wildlife Watching (Facebook)	<a href="https://www.facebook.com/offalwatch/?checkpoint_src=any">https://www.facebook.com/offalwatch/?checkpoint_src=any</a>
Offal Wildlife Watching (Instagram)	<a href="https://www.instagram.com/offal_watch/">https://www.instagram.com/offal_watch/</a>
Offal Wildlife Watching (X)	<a href="https://x.com/offal_watch">https://x.com/offal_watch</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?**

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 UMN Policy on travel 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?**

Yes, Sponsored Projects Administration

**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**

N/A

## Work Plan Amendments

Amendment ID	Request Type	Changes made on the following pages	Explanation & justification for Amendment Request (word limit 75)	Date Submitted	Approved	Date of LCCMR Action
1	Amendment Request	<ul style="list-style-type: none"> <li>• Budget</li> <li>• Other</li> <li>• Budget - Personnel</li> <li>• Budget - Professional / Technical Contracts</li> <li>• Budget - Capital, Equipment, Tools, and Supplies</li> <li>• Budget - Travel and Conferences</li> <li>• Budget - Printing and Publication</li> <li>• Attachments</li> </ul>	<p>Co-leader took faculty position in Alaska, increasing work for remaining personnel in final months. PI is at higher pay rate &amp; UMN adjusted salaries higher for Extension personnel. Hence personnel costs higher to complete remaining work. Request to reallocate funds from contracts &amp; services, supplies etc., capital expenditures, printing to support increased work by two Extension personnel &amp; PI. With existing resources, we can ensure decreases in reallocated budget areas do not impact completing the project.</p>	April 25, 2025	Yes	May 1, 2025

# Additional Status Update Reporting

## Additional Status Update August 11, 2025

**Date Submitted:** December 4, 2025

**Date Approved:** December 16, 2025

### **Overall Update**

See Final Status update below

### **Activity 1**

See Final Status update below

*(This activity marked as complete as of this status update)*

### **Activity 2**

See Final Status update below

*(This activity marked as complete as of this status update)*

### **Activity 3**

See Final Status update below

*(This activity marked as complete as of this status update)*

### **Dissemination**

See Final Status update below

# Status Update Reporting

## Final Status Update August 14, 2025

**Date Submitted:** December 4, 2025

**Date Approved:** December 16, 2025

### Overall Update

With ENRTF support hundreds of hunter participants have registered to help monitor and collect images of scavenger hundreds of gut piles throughout Minnesota (see Activity 1 update). With these data, we have recorded >62 different species visiting offal. We have analyzed how scavenger assemblages vary across biomes in Minnesota, the hierarchy of avian visitors to inform which species may be most susceptible to contaminants found in offal, and have recorded new behavior of predators using offal as hunting grounds.

The project has state and nationwide attention in newspaper articles, tv shows and podcasts, which has led to a steadily increasing in participants. Many hunters reported enjoyment in participating, surprising discoveries, and have participated for consecutive years.

We also created opportunities for individuals to get involved beyond hunting and have invited volunteers to: help at outreach events to share research findings and recruit participants, help with large data analysis projects, create visuals and outreach materials for events and social media, share their photography expertise and many have used our data in “capstone” projects required in the 4H and and Master Naturalist programs.

>10,000 volunteers worldwide have also contributed to classifying images through our project on Zooniverse.

### Activity 1

Hunter participation steadily grew and nearly quadrupled since the start. Much of this can be attributed to increased outreach events (in-person and virtual).

In 2022, 51 hunters registered to help us collect data; not all registrants were successful in their hunts and we monitored 37 gut piles.

In 2023, 169 hunters registered to help us collect data; we monitored 101 gut piles.

We attribute this significant increase in participation and data collection from 2022-23 to people returning to hunting after Covid and the creation of a full-time project Coordinator position with UMN Extension. The Extension network allowed us to reach broader audiences through collaborations with existing programs. In these 2 years, we also significantly increased our camera lending inventory thanks to LCCMR funds.

Our project recruitment goals were overly optimistic and not meeting them did not impact project effectiveness.

We created and executed Advanced Training workshop open to the public and Master Naturalists on Camera Trap History and Techniques. All participants who attended reported “a deeper understanding of the subject matter” and all “discovered situations where they can use what they learned.” Participated in new events statewide, e.g. 4H Shooting Sports Invitational, archery competitions, Sherburne National Wildlife Refuge’s Wildfestival.

*(This activity marked as complete as of this status update)*

## **Activity 2**

In 2022 and 2023, purchased 50, 30 new camera kits (respectively) to loan participants; significantly increased our camera lending library for the project. In these years we successfully collected, backed up and archived image data from 37 and 101 gut piles, respectively.

Classification and identification of 2022 and 2023 image sets are complete, collaboration with Zooniverse, an online participatory science platform. Disease exposure risk identified via species richness; 60+ different species; learned birds dominate visits and most exposed. Corvids (like crows / ravens / magpies) and raptors are especially frequent. Because birds spot the gut piles quickly, especially in open habitats, they often arrive before most mammals.

Images archived: Google Drive, external hard drives, and project personnel computers.

Funding for this project has allowed it to grow significantly: as of 2024, we now have 200 camera kits to loan to hunters to help us collect offal data at their gut piles. As hunter participation has increased every year of the project, so has data collection and we have monitored 371 gut piles since the project's beginning and have over 400,000 photos in our archive. 2024 was the largest year of data collection with 111 gut piles monitored.

*(This activity marked as complete as of this status update)*

## **Activity 3**

In 2023 and 2024, we participated in 13 in-person and virtual outreach and educational events (including Gathering Partners conference both years) geared towards deer hunters and conservationists. Attendees learned about our research and how they can contribute. Outreach events like these have led to increased collaboration between groups like Master Naturalists, 4H members and the public and have led to contributions to special data analysis projects and Master Naturalist and 4H "capstone projects" about our research.

We also presented at wildlife-related conferences: the 2024 and 2025 Midwest Fish and Wildlife Conferences, MN Phenology Gathering in 2024, and the MN Deer and Turkey Classic event, amongst others.

While we were unable to successfully coordinate a presentation with the MN Deer Hunters Association, we participated in events with similar groups including an interview with the National Deer Association's Coffee and Deer podcast and Backcountry Hunters and Angler's Rendezvous and their other local outreach events. This met the goal of reaching the hunting audience.

We now have a social media presence on Facebook, Instagram and X. Our website, [offal.umn.edu](http://offal.umn.edu), serves as a hub for participant resources and project results. Here we have posted media appearances and links and published manuscripts.

*(This activity marked as complete as of this status update)*

## **Dissemination**

We have developed various outlets to engage with participant contributors and share project impacts. We have successfully curated a social media following (Facebook, Instagram and X) and our website ([offal.umn.edu](http://offal.umn.edu)) serves as a hub for participant resources, project updates and results.

Having support from the UMN Extension Communications team has allowed us to distribute a regular project newsletter to a list of about 600 participants and stakeholders. This e-newsletter shares project news, photos, new results and publications and highlights volunteer experiences. The Extension Communications team has also helped us create and distribute press releases in 2022 and 2023 and we had a large increase in media attention from those (including Minnesota Public Radio and Star Tribune coverage).

In an effort to attract, inform, and enlist the help of volunteer hunter participation in our research, we have completed

over 50 outreach events and presentations throughout the state. These include but are not limited to: meeting with hunting groups, attending 4H events and webinars, outreach booths at the state fair and wildlife events, ecological conferences and hosting webinars. We estimate over 14,000 people have directly heard about Offal Wildlife Watching from these in-person events alone.

# Additional Status Update Reporting

## Additional Status Update January 28, 2025

**Date Submitted:** April 18, 2025

**Date Approved:** May 1, 2025

### Overall Update

2024 participant numbers:

172 individuals/organizations (state or local parks) participants

at least 97 cameras deployed (exact # still TBD as some participants haven't filled out forms/sent photos yet)

8500+ Zooniverse project volunteers

We have recorded at least 60 different scavenger species across Minnesota within each biome. Splitting the mammalian scavengers into groups, we discovered that carnivores find gut piles on different days depending on biome whereas mustelids tend to find gut piles by day 13 regardless of biome. Additionally, the average maximum abundance for deer visiting gut piles is higher in the prairie biome than Coniferous and Deciduous. For our second objective, we successfully established a meaningful program for hunter citizen-scientists to participate in. The Extension program coordinator has created at least 30 opportunities, via podcasts, local media and in-person outreach events, to advertise the project.

They have also designed a 3-D gut pile for demonstration purposes. We published a paper about the project in the Journal of Extension that highlights the success of the project and encourages other states to create similar projects.

### Activity 1

This activity was previously marked complete.

*(This activity marked as complete as of this status update)*

### Activity 2

This activity is nearly complete. A few hunters still plan to share images. Since this objective is tied closely to data collection during the hunting season, this update will not change substantially from the March 2024 update.

Over the past 5 years, 90-140 hunters have participated each year. Additionally, more than 20 hunters deployed cameras in more than one season. We collected over 350,000 pictures from more than 200 offal locations. We recorded at least 59 different scavenger species, including fishers (*Pekania pennanti*), deer, golden eagles (*Aquila chrysaetos*), and pileated woodpeckers (*Dryocopus pileatus*). The preliminary results demonstrate proof of concept and have produced interesting results. For example, contrary to our hypothesis, carnivores seem more prevalent than birds in images from the prairie parkland biome.

### Activity 3

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. For this objective, we continue to produce newsletters to past and future participants as well as interested individuals. The Extension Program Coordinator has facilitated this dissemination of information and helped to make connections with past and future hunter volunteers. We have also acquired a 3-D printed gut pile designed by an artist to assist in the dissemination of information to the public. This will give participants and potential participants an opportunity to discuss the impacts of gut piles and different gut pile nutrition using hands-on learning. The remaining milestones for this objective will be completed in 2025.

Extension programs across the United States could easily incorporate this project into their programming to create an

offal network, expanding our understanding of the impacts of hunter-provided gut piles in different biomes and creating opportunities for hunters to participate in research as citizen scientists. By publishing results from this project we have demonstrated how it can be a template for the development of additional Extension projects that focus on work with consumptive user groups.

### **Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. As previously stated, we have disseminated information about the project on several media outlets including social media (Instagram, Twitter, and Facebook), podcasts (National Deer Association, Conservation Unfiltered, and Trout Unlimited), and local media (MPR, Outdoor News Radio and print, and Star Tribune).

Dissemination numbers:

- 8,643 Zooniverse participants
- 90-140 hunters participating each year
- 2024 had at least 104 cameras deployed on offal
- recorded at least 59 scavenger species

# Status Update Reporting

## Status Update March 1, 2025

**Date Submitted:** April 18, 2025

**Date Approved:** May 1, 2025

### Overall Update

The Offal Wildlife Watching project has two objectives: 1) produce data that fills a knowledge gap needed for better wildlife management and 2) create a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. For the first objective, we collected over 350,000 images from more than 260 hunter volunteers gut piles.

We have recorded at least 60 different scavenger species across Minnesota within each biome. Splitting the mammalian scavengers into groups, we discovered that carnivores find gut piles on different days depending on biome whereas mustelids tend to find gut piles by day 13 regardless of biome. Additionally, the average maximum abundance for deer visiting gut piles is higher in the prairie biome than Coniferous and Deciduous. For our second objective, we successfully established a meaningful program for hunter citizen-scientists to participate in. The Extension program coordinator has created at least 27 opportunities, via podcasts, local media and in-person outreach events, to advertise the project.

They have also designed a 3-D gut pile for demonstration purposes. We published a paper about the project in the Journal of Extension that highlights the success of the project and encourages other states to create similar

### Activity 1

This activity was previously marked complete.

*(This activity marked as complete as of this status update)*

### Activity 2

This activity is nearly complete. A few hunters still plan to share images. Since this objective is tied closely to data collection during the hunting season, this update will not change substantially from the March 2024 update.

We successfully lent all ~150 camera kits out to hunters. Because of the borrowing need, we will purchase more cameras for the 2024-hunting season. For objective 2, as hunters retrieved their cameras and sent us images, we backed them up on Google Drive and external hard drives. We have collected over 350,000 images that are being analyzed by over 8,000 Zooniverse volunteers. We have seen differences among biomes in terms of when species discover and group at gut piles. For example, the average maximum abundance of raptors occurs on the second day in the prairie biome, the fourth day in the deciduous biome, and the sixth day in the coniferous biome. The remaining milestones for this objective will be completed in 2025.

### Activity 3

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. For this objective, we continue to produce newsletters to past and future participants as well as interested individuals. The Extension Program Coordinator has facilitated this dissemination of information and helped to make connections with past and future hunter volunteers. We have also acquired a 3-D printed gut pile designed by an artist to assist in the dissemination of information to the public. This will give participants and potential participants an opportunity to discuss the impacts of gut piles and different gut pile nutrition using hands-on learning. The remaining milestones for this objective will be completed in 2025.

8500+ Zooniverse project volunteers participated in identifying scavengers in images since the 2024 hunting season.

**Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. As previously stated, we have disseminated information about the project on several media outlets including social media (Instagram, Twitter, and Facebook), podcasts (National Deer Association, Conservation Unfiltered, and Trout Unlimited), and local media (MPR, Outdoor News Radio and print, and Star Tribune). We will continue to do this into the new hunting season. We also have presented at the Midwest Fish and Wildlife Conference and regularly connect with participants and interested individuals through regular newsletters. We are also making regular contributions to our social media pages (Facebook, Instagram, and Twitter) and project website to promote the project, share results, and attract participants. We also currently have one accepted peer-reviewed manuscript in the Journal of Extension. Two more manuscript summarizing some results is also in preparation.

Since the 2024 season, 8 different outreach/educational events, reaching about 10,000 individuals who learned about OWW, including at the MN State Fair.

# Status Update Reporting

## Status Update September 1, 2024

**Date Submitted:** April 18, 2025

**Date Approved:** May 1, 2025

### Overall Update

The Offal Wildlife Watching project has two objectives: 1) produce data that fills a knowledge gap needed for better wildlife management and 2) create a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. For the first objective, we collected over 350,000 images from more than 260 hunter volunteers gut piles. We have recorded at least 60 different scavenger species across Minnesota within each biome. Splitting the mammalian scavengers into groups, we discovered that carnivores find gut piles on different days depending on biome whereas mustelids tend to find gut piles by day 13 regardless of biome. Additionally, the average maximum abundance for deer visiting gut piles is higher in the prairie biome than Coniferous and Deciduous. For our second objective, we successfully established a meaningful program for hunter citizen-scientists to participate in. The Extension program coordinator has created at least 20 opportunities, via podcasts, local media and in-person outreach events, to advertise the project. They have also acquired a 3-D gut pile for demonstration purposes. We have an accepted manuscript (publication January 2015) in the Journal of Extension that highlights the success of the project and encourages other states to create similar opportunities.

### Activity 1

The goal of this activity is to attract, inform, and enlist the help of volunteer hunters to participate in the Offal Wildlife Watching project statewide. Since the last hunting season, we have participated in several events including the Minnesota State Fair at the DNR building. This event made project information available to thousands of fair goers at the more popular building at the fair. We will again participate in the 4-H shooting sports invitational and several special hunt orientations in preparation for the 2024 hunting season. We will also participate in the Minnesota deer and turkey classic, Gathering Partners, traditional shoots, Sherburne National Wildlife Festival, MNDNR Deer Hunting webinar, and Fridays with Forester. Additionally, we promoted the project on several media outlets including social media (Instagram, Twitter, and Facebook). Closer to the start of firearm opener, we will promote the project on podcasts and local media (MPR, Outdoor News Radio and print, and Star Tribune). These efforts increased our participation by 100% from previous years. A 3-D printed gut pile will also be used in the future to educate the public about the project and gut pile ecology.

*(This activity marked as complete as of this status update)*

### Activity 2

We have two objectives for this activity. 1. work with hunter volunteers to collect images via deployed remote camera traps at deer offal piles and 2. gather images from hunters, back them up and archive copies, enter individual hunter site data, and analyze images to answer key management questions. Since this objective is tied closely to data collection during the hunting season, this update will not change substantially from the March 2024 update. For the first objective, we successfully lent all 139 camera kits out to hunters. Because of the borrowing need, we will purchase more cameras for the 2024-hunting season. For objective 2, as hunters retrieved their cameras and sent us images, we backed them up on Google Drive and external hard drives. We have collected over 350,000 images that are being analyzed by over 8,000 Zooniverse volunteers. We have seen differences among biomes in terms of when species discover and group at gut piles. For example, the average maximum abundance of raptors occurs on the second day in the prairie biome, the fourth day in the deciduous biome, and the sixth day in the coniferous biome. The remaining milestones for this objective will be completed in

### **Activity 3**

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. For this objective, we continue to produce newsletters to past and future participants as well as interested individuals. The Extension Program Coordinator has facilitated this dissemination of information and helped to make connections with past and future hunter volunteers. We have also acquired a 3-D printed gut pile designed by an artist to assist in the dissemination of information to the public. This will give participants and potential participants an opportunity to discuss the impacts of gut piles and different gut pile nutrition using hands-on learning. The remaining milestones for this objective will be completed in 2024.

### **Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. As previously stated, we have disseminated information about the project on several media outlets including social media (Instagram, Twitter, and Facebook), podcasts (National Deer Association, Conservation Unfiltered, and Trout Unlimited), and local media (MPR, Outdoor News Radio and print, and Star Tribune). We will continue to do this into the new hunting season. We also have presented at the Midwest Fish and Wildlife Conference and regularly connect with participants and interested individuals through regular newsletters. We are also making regular contributions to our social media pages (Facebook, Instagram, and Twitter) and project website to promote the project, share results, and attract participants. We also currently have one accepted peer-reviewed manuscript in the Journal of Extension. Two more manuscript summarizing some results is also in preparation.

# Status Update Reporting

## Status Update March 1, 2024

**Date Submitted:** February 29, 2024

**Date Approved:** May 8, 2024

### Overall Update

The Offal Wildlife Watching project has two objectives: 1) produce data that fills a knowledge gap needed for better wildlife management and 2) create a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. For the first objective, we collected over 300,000 images from more than 150 hunter volunteers. We have recorded at least 55 different scavenger species across Minnesota within each biome. Splitting the avian scavengers into groups, we have discovered that each group finds carrion on different days. Corvids (crow, raven, etc.) find the gut-pile on the first day followed by raptors, woodpeckers, songbirds, and others. Though we have seen other differences among biomes (see 9/1/23 report), we do not detect differences in visits for avian scavengers. For our second objective, we successfully established a meaningful program for hunter citizen-scientists to participate in. The Extension program coordinator has successfully expanded the community of volunteer hunters and created at least 20 opportunities, via podcasts, local media and in-person outreach events, to advertise the project. We also have an accepted manuscript in the Journal of Extension that highlights the success of the project and encourages other states to create similar opportunities.

### Activity 1

The goal of this activity is to attract, inform, and enlist the help of volunteer hunters to participate in the Offal Wildlife Watching project statewide. To attract hunters, we participated in several events including the Minnesota State Fair alongside Minnesota 4-H, 4-H shooting sports invitational, and several special hunt orientations. We will also participate in the Minnesota deer and turkey classic, Gathering Partners, traditional shoots, Sherburne National Wildlife Festival, MNDNR Deer Hunting webinar, and Fridays with Forester. Additionally, we promoted the project on several media outlets including social media (Instagram, Twitter, and Facebook), podcasts (National Deer Association, Conservation Unfiltered, and Trout Unlimited), and local media (MPR, Outdoor News Radio and print, and Star Tribune). These efforts increased our participation by 100% from previous years. We also offered a Master Naturalist advanced course in November. This course introduced participants to remote cameras through history, types, and different methods. We also acquired a gut pile from Three Rivers Park for participants to observe and set several remote cameras for participants to visit.

### Activity 2

We have two objectives for this activity. 1. work with hunter volunteers to collect images via deployed remote camera traps at deer offal piles and 2. gather images from hunters, back them up and archive copies, enter individual hunter site data, and analyze images to answer key management questions. For the first objective, we successfully lent all 139 camera kits out to hunters. Because of the borrowing need, we may purchase more cameras for the coming hunting season. Several of the cameras that were lent out were successfully set at gut piles to collect images. For objective 2, as hunters retrieved their cameras and sent us images, we backed them up on Google Drive and external hard drives. We have begun to analyze data from past years. We have seen differences among biomes in terms of when species discover and group at gut piles. For example, the average maximum abundance of raptors occurs on the second day in the prairie biome, the fourth day in the deciduous biome, and the sixth day in the coniferous biome. The remaining milestones for this objective will be completed in 2024.

### Activity 3

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. For this objective, we have presented results at the Midwest Fish and Wildlife Conference. We also presented

project development and tips at the same conference. We also presented results via a poster at the Minnesota chapter of The Wildlife Society meeting. We also continue to produce newsletters to past and future participants as well as interested individuals. The Extension Program Coordinator has facilitated this dissemination of information and helped to make connections with past and future hunter volunteers. We are also in the process of working with an artist to create a 3D-printed gut pile to assist in the dissemination of information to the public. The remaining milestones for this objective will be completed in 2024.

### **Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. As previously stated, we have disseminated information about the project on several media outlets including social media (Instagram, Twitter, and Facebook), podcasts (National Deer Association, Conservation Unfiltered, and Trout Unlimited), and local media (MPR, Outdoor News Radio and print, and Star Tribune). We also have presented at the Midwest Fish and Wildlife Conference and regularly connect with participants and interested individuals through regular newsletters. We are also making regular contributions to our social media pages (Facebook, Instagram, and Twitter) and project website to promote the project, share results, and attract participants. We also currently have one accepted peer-reviewed manuscript in the Journal of Extension. One more manuscript summarizing some results is also in preparation.

# Status Update Reporting

## Status Update September 1, 2023

**Date Submitted:** August 31, 2023

**Date Approved:** September 27, 2023

### Overall Update

The Offal Wildlife Watching project has two main objectives: 1) produce data that fills a knowledge gap needed for better wildlife management and 2) create a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. For the first objective, we have collected more than 200,000 images from more than 90 hunter volunteers, many of whom have participated for more than one year. We have recorded at least 49 different scavenger species across Minnesota and within each biome. We have seen that different scavenger groups congregate in different numbers and find gut piles at different times depending on biome. For example, raptors in the prairie quickly discover offal and congregate in large groups, and maintain high group sizes, whereas in the coniferous region, group size is low for the whole month. For our second objective, we have successfully established a meaningful program for hunter citizen scientists. We have hired an Extension Program Coordinator who has expanded the visibility of the project and the hunter volunteer community. We also have a manuscript in review at the Journal of Extension highlighting the success of the project and encouraging other states, universities, or organizations to create similar

### Activity 1

The goal of this activity is to attract, inform, and enlist the help of volunteer hunters to participate in the Offal Wildlife Watching project statewide. To attract additional hunters and advertise the success of the project, we purchased two DSLR remote camera kits to record high quality images and video of scavengers. Additionally, we purchased spotting scopes and digiscoping attachments to provide an opportunity to directly watch gut pile scavengers live and possibly provide a live stream for people that are interested in learning more about scavengers and the project. Additionally, a Master Naturalist Advanced training course will be offered this fall. This course will focus on the history and use of camera traps as well as field instruction on remote camera setup. In collaboration with Three Rivers Park District, we will also set up a spotting scope where participants can observe an active gut pile. Finally, we are currently maintaining a Facebook, Twitter, and Instagram social media presence. We have also sent out two newsletters highlighting results, advertising participation, and highlighting volunteer hunters.

### Activity 2

We have two objectives for this activity. 1. work with hunter volunteers to collect images via deployed remote camera traps at deer offal piles and 2. gather images from hunters, back them up and archive copies, enter individual hunter site data, and analyze images to answer key management questions. For the first objective, in 2023, we purchased 135 remote camera kits for a total of 160 to prepare for hunters that may want to borrow a camera. Depending on the borrowing need, we will purchase more cameras in the following year. For objective 2, we have purchased three new external hard drives to back up image data and to archive analysis. We have begun to analyze images from 2018-2022 and have found interesting trends across Minnesota. For example, we have noticed some predators (barred owls and bobcats) capturing rodent scavengers, while also taking advantage of the gut piles itself. Whether these predators are opportunistically eating rodents or targeting them at gut piles is something we will explore further. These results are in press to be published in the journal Food Webs in September 2023. The remaining milestones for this objective will be completed in 2024.

### Activity 3

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. For this objective we have presented data to the Arrowhead Bowhunters Alliance as well as produced two newsletters distributed to past and future participants as well as interested individuals. In a professional setting, we

have presented results at the Ecological Society of America's annual conference in Portland, OR. This past May, we also presented information and data to participants of the Minnesota Master Naturalists attending the Gathering Partners Conference. To better facilitate our dissemination goals, we hired an Extension Program Coordinator who has been preparing materials, contacting hunting groups, and attending events including the Rapids Archery Club traditional shoot, Coyote Creek Outdoor Show, Brown County fair, and four days at the Minnesota State fair to promote the project. Future events include Prairie Pothole Fest, 4H Shooting Sports Invitational, Sherburne Wildlife Fest, Minnesota Deer & Turkey classic, as well as various special hunt orientations. The remaining milestones for this objective will be completed in 2024.

### **Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. We have presented this project on the National Deer Association's podcast, "NDA's Coffee and Deer", the Conservation Unfiltered podcast and Trout Unlimited and Costa 5 Rivers podcast, "Emerging." Additionally, the newspaper the Ely Echo ran a story promoting the project. As previously stated, we also have presented at the Minnesota Master Naturalist Gathering Partners meeting and the Ecological Society of America conference. We are also making regular contributions to our newly established social media pages (Facebook, Instagram, and Twitter) to promote the project, share results, and attract participants. We also updated the project website to include a results page. We also currently have one accepted peer review manuscript in the journal Food Webs and an additional in review at the Journal of Extension. One more manuscript summarizing some results is also in preparation. We are also using the University of Minnesota Extension's media and public relations team and connections to spread awareness of the project to media sources.

# Status Update Reporting

## Status Update March 1, 2023

**Date Submitted:** February 28, 2023

**Date Approved:** March 9, 2023

### Overall Update

The Offal Wildlife Watching project has two main objectives: 1) produce data that fills a knowledge gap needed for better wildlife management and 2) create a novel and meaningful program for hunter participation in citizen science and enhancement of natural resources. Thus far for our first objective, we have collected over 200,000 images of scavengers visiting hunter provided deer gut piles across all four Minnesota biomes and Twin cities metro area. The past season (2022) resulted in over 55,000 remote camera images captured over gut piles. These data, once analyzed, will help address a knowledge gap regarding which species are using deer gut piles across Minnesota, when different species arrive, and how location in the state (biome) affect scavenger assemblages. For our second objective, we have successfully established a meaningful program for hunter citizen scientists to participate in. Many hunters have participated for multiple seasons creating a consistent data source and a meaningful connection between researchers and hunters. Hunter participation dynamics are still being analyzed. Other participants have expressed their appreciation for the structured scientific curiosity in scavengers at hunter provided gut piles.

### Activity 1

The goal of this activity is to attract, inform, and enlist the help of volunteer hunters to participate in the Offal Wildlife Watching project statewide. We set the goal to recruit and train 250 volunteers for the 2022 hunting season. In the short time between the beginning of the project and hunting season, we managed to recruit over 100 hunters, including participants in depredation hunts associated with Three Rivers Park district. These hunters are now aware of the project and are more likely to contribute in following years. Additionally, we have established a successful relationship with Three River Park District and can continue to recruit hunters through their programs in the future. We also created a Google site, making recruitment and participation signup simpler. Additionally, we promoted the project on WCCO outdoors, at gun ranges, and on multiple social media sites. We were unable to host a Master Naturalist Advanced Training in 2022 like before. Starting in summer 2023, we will connect with hunting groups and gun ranges across the state host training opportunities for interested hunters. We will also expand our social media presence to increase project visibility. The remaining milestones for this objective will be completed in 2023.

### Activity 2

We have two objectives for this activity. First, we planned to work with hunter volunteers to collect images via deployed remote camera traps at deer offal piles. Over the course of the project we aim to order, program, and create 275 camera kits to lend to hunters. We purchased 25 camera kits in 2022 to prepare for hunters that wanted to borrow a camera. As we increase our training and outreach (activity 1), we can increase our camera lending ability and will purchasing additional kits. The second objective is to collect images from hunters, back them up and archive copies, enter individual hunter site data, and analyze images to answer key management questions. Of the 100+ hunters that agreed to participate in the Offal Wildlife Watching project, we successfully collected images from more than 30 hunter gut piles, similar to a typical harvest rate in Minnesota (~30%). All images have been backed up via the cloud and external hard drives. The remaining milestones for this objective will be completed in 2023 and 2024.

### Activity 3

The objective of our third activity was to share project results with hunter volunteers and disseminate information to the public. We are in the process of hiring an Extension Program Coordinator that will help to create material with project results to disseminate to hunters that have participated in the project. Similarly, the coordinator will create materials with results intended for hunters as a recruitment tool. Additionally, the coordinator will travel to meetings

hosted by hunting groups such as Minnesota Deer Hunters Association, Backcountry Hunters and Anglers, and Bluffland Whitetail Association. In May 2023, we will present information at the Gathering Partners conference, which is the leading outreach and extension conference in the state, regarding results of past years. We have also submitted an abstract to the Ecological Society of America conference requesting to present results of Offal Wildlife Watching project in fall of 2023. The remaining milestones for this objective will be completed in 2023 and 2024.

### **Dissemination**

The dissemination goal for this project is to provide information and results through popular press articles, peer-reviewed papers, professional presentations, and social media with the goal of developing this program into a long-term University of Minnesota Extension program. We have presented the project on WCCO Outdoors, social media sites of several deer hunting groups, and via several gun range member lists. We are currently writing manuscripts for the peer-reviewed journals Food Webs and Journal of Extension and a popular press article for The Wildlife Professional with the goal having all three submitted by December 2023. Finally, we are also working with an undergraduate student from the University of Minnesota that has written a proposal to conduct research as part of the Offal Wildlife Watching project and present findings in a University symposium. Going forward, we will establish a more consistent social media presence to elicit help from hunters and disseminate research findings.