



# Environment and Natural Resources Trust Fund (ENRTF)

## M.L. 2019 ENRTF Work Plan (Main Document)

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**Today's Date:** August 23, 2018

**Date of Next Status Update Report:** March 1, 2020

**Date of Work Plan Approval:**

**Project Completion Date:** June 30, 2022

**Does this submission include an amendment request?** No

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**PROJECT TITLE:** Mapping habitat use and disease of urban carnivores

**Project Manager:** Dr. Nicholas McCann

**Organization:** University of Minnesota

**College/Department/Division:** College of Food, Agricultural and Natural Resource Sciences/Department of Fisheries, Wildlife and Conservation Biology

**Mailing Address:** B52 Skok Hall, 2003 Upper Buford Circle

**City/State/Zip Code:** Saint Paul/Minnesota/55108

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**Location:** The Metro Region and the Minneapolis-St. Paul Metropolitan Statistical Area; including the following counties: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

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**Total Project Budget:** \$500,000

**Amount Spent:** \$0

**Balance:** \$500,000

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**Legal Citation:** M.L. 2019, Chp. xx, Sec. xx, Subd. xx

**Appropriation Language:**

**I. PROJECT STATEMENT:** Foxes and coyotes are becoming increasingly common in urban landscapes; however, little is known about these animals in the Twin Cities Metro Area (TCMA). Area residents now have opportunities to spot these wildlife species in parks and other green spaces close to their homes, but this proximity can also generate concern about where foxes and coyotes live, how many there are, and if they carry diseases that can infect pets and people. This study will help to address these concerns by demystifying the behavior of these urban carnivores while also identifying areas that can be managed to reduce potential conflicts. Our team will focus on two objectives:

**1) Identify the abundance, distribution, and diet of three species of wild canids (coyotes, red foxes, and gray foxes) in the Twin Cities Metro Area.**

**2) Determine the prevalence of diseases within these wildlife populations and whether the movement patterns of these animals may create hotspots of risk to pets or people.**

We will map the habitat use and assess the diets of foxes and coyotes along a gradient of urban land use in the TCMA to understand how these animals exploit resources in human-dominated landscapes. At the same time, we will measure disease prevalence in our study animals which will help to assess the risk of disease transmission between foxes, coyotes, pets, and people. Diseases such as rabies are present in Twin Cities Metro Area wildlife (including foxes), but we do not know how prevalent diseases are, so we cannot estimate risk; this study will be the first to quantify the prevalence of diseases that infect foxes and coyotes in Minnesota. Mapping patterns of habitat use along with diet composition and disease prevalence will help managers reduce human-wildlife conflicts and inform efforts to manage and acquire ecologically-valuable green spaces.

Most Minnesota residents live in urban areas but do not know much about the wildlife that lives near them. By working with the Three Rivers Parks District and a diverse coalition of non-profit organizations (including the Minnesota Land Trust, Friends of the Mississippi River, and the Minnesota Trappers Association), we will provide information that will help influence the public perceptions and management of three native wildlife species in the TCMA. Further, this project will provide a fantastic training opportunity for the UMN Fisheries, Wildlife, and Conservation Biology Club. This group will be tracking our study animals within the community and will be able to talk with and answer questions from residents in the area. This will help further educate the public about wildlife and train these students in the skills necessary to be effective wildlife managers.

## **II. OVERALL PROJECT STATUS UPDATES:**

**First Update March 1, 2020**

**Second Update September 1, 2021**

**Third Update March 1, 2021**

**Fourth Update September 1, 2022**

**Fifth Update March 1, 2022**

**Final Report between project end (June 30) and August 15, 2022**

**III. PROJECT ACTIVITIES AND OUTCOMES:**

**ACTIVITY 1 Title: Map areas used by foxes and coyotes to assess habitat needs and reduce conflicts with people**

**Description:** We will map the areas that foxes and coyotes use and identify the habitats that they need. We will use best practices to capture individual gray foxes, red foxes, and coyotes (15 of each species for a total of 45 study animals). We will attach a GPS collar to each fox and coyote we capture before releasing it. GPS collars will be programmed to collect multiple locations (2,000 locations per year) from each study animal and transmit these locations to us via satellite each week. Locations will be analyzed using GIS software to identify habitat needs, quantify survival rates, determine home range areas, and estimate population sizes. We will determine how much “human food” foxes and coyotes eat by collecting hair samples from each study animal that we capture and examining fecal samples when available. Stable isotope analysis of hair samples will tell us how often they eat corn-based foods that are common in human diets but rare in the natural diets of foxes and coyotes.

**ACTIVITY 1 ENRTF BUDGET: \$429,265**

<b>Outcome</b>	<b>Completion Date</b>
1. Identify study sites, acquire equipment, and train staff	September 30, 2019
2. Capture and process foxes and coyotes – season 1	February 28, 2020
3. Capture and process foxes and coyotes – season 2	February 28, 2021
4. Submit hair samples for stable isotope analysis	March 31, 2021
5. Final report and activity results submitted	June 30, 2022

**First Update March 1, 2020**

**Second Update September 1, 2021**

**Third Update March 1, 2021**

**Fourth Update September 1, 2022**

**Fifth Update March 1, 2022**

**Final Report between project end (June 30) and August 15, 2022**

**ACTIVITY 2 Title: Map infectious diseases to assess risk for wildlife, pets, and people**

**Description:** We will determine which diseases infect coyotes and foxes. We will test for multiple diseases that threaten not only the health of foxes and coyotes, but also people and their pets. We will collect biological samples (blood and feces) from each fox and coyote that we capture during Activity 1 (a total of 45 individual study animals). Each of the samples will be tested for common diseases (rabies, distemper, heartworm, toxoplasmosis, leptospirosis, parvovirus, echinococcosis, Lyme disease). Test results will enable us to quantify the prevalence of infectious diseases and map locations of diseased animals.

**ACTIVITY 2 ENRTF BUDGET: \$70,735**

<b>Outcome</b>	<b>Completion Date</b>
1. Submit biological samples for disease testing	March 31, 2021
2. Final report and activity results submitted	June 30, 2022

**First Update March 1, 2020**

**Second Update September 1, 2021**

**Third Update March 1, 2021**

**Fourth Update September 1, 2022**

**Fifth Update March 1, 2022**

**Final Report between project end (June 30) and August 15, 2022**

**IV. DISSEMINATION:**

**Description:** We will present results at state and national scientific conferences (e.g., annual meetings of The Wildlife Society). We will make scientific publications that result from this project available through University of Minnesota websites, Open Access journal websites, and upon a request. Outreach will include speaking engagements at nature centers (e.g., the Eastman Nature Center operated by the Three Rivers Park District) and at meetings held by organizations that are interested in conservation and management of wildlife (e.g., the Minnesota Trappers Association). We expect that this research will draw media attention, which will provide additional opportunities to inform the public about findings from this project.

The Minnesota Environment and Natural Resource Trust Fund (ENRTF) will be acknowledged through use of the trust fund logo or attribution language on project print and electronic media, publications, signage, and other communications per the [ENRTF Acknowledgement Guidelines](#).

**First Update March 1, 2020**

**Second Update September 1, 2021**

**Third Update March 1, 2021**

**Fourth Update September 1, 2022**

**Fifth Update March 1, 2022**

**Final Report between project end (June 30) and August 15, 2022**

**V. ADDITIONAL BUDGET INFORMATION:**

**A. Personnel and Capital Expenditures**

**Explanation of Capital Expenditures Greater Than \$5,000:** N/A

**Explanation of Use of Classified Staff:** N/A

**Total Number of Full-time Equivalents (FTE) Directly Funded with this ENRTF Appropriation:**

Enter Total Estimated Personnel Hours for entire duration of project: 9,859	Divide total personnel hours by 2,080 hours in 1 year = TOTAL FTE: 4.74
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**Total Number of Full-time Equivalents (FTE) Estimated to Be Funded through Contracts with this ENRTF Appropriation:**

Enter Total Estimated Contract Personnel Hours for entire duration of project: 70	Divide total contract hours by 2,080 hours in 1 year = TOTAL FTE: 0.034
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**VI. PROJECT PARTNERS:**

**A. Partners outside of project manager’s organization receiving ENRTF funding:** N/A

**B. Partners outside of project manager’s organization NOT receiving ENRTF funding**

Name	Title	Affiliation	Role
John Moriarity	Senior Manager of Wildlife	Three Rivers Park District	Assist with live-trapping efforts on Three Rivers Park District lands
Steven Hogg	Wildlife Specialist	Three Rivers Park District	Assist with live-trapping efforts on Three Rivers Park District lands

**VII. LONG-TERM- IMPLEMENTATION AND FUNDING:** This project will initiate long-term research opportunities for members of the University of Minnesota’s Fisheries, Wildlife, and Conservation Biology Club who will participate in research activities described in this proposal. Students will continue supervised research activities after this project is completed, thereby using this project as a springboard to secure future funding and for developing a long-term data set.

This project will provide foundational information to managers that does not currently exist, resulting in multiple benefits for Minnesota wildlife. Activities 1 and 2 will support development of management strategies for foxes and coyotes. Our project will also serve a model that can be used to develop additional studies for other species (e.g., raccoons) and other urban areas (e.g., Duluth). Activity 1 will inform “greening” initiatives that provide wildlife with habitat. Examples of greening initiatives that could benefit from this research include the LCCMR-supported Great River Greening and Greening the Green Line. Information from Activity 2 will result in a knowledge base of diseases that affect wild canids, pets, and people and act as a first step toward long-term disease monitoring and mitigation programs. Activity 1 will show whether fox and coyote diets influence their health and the risk of conflict with people and pets. Collectively, this project will connect Minnesotans that reside in urban settings to wildlife.

**VIII. REPORTING REQUIREMENTS:**

- Project status update reports will be submitted March 1 and September 1 each year of the project
- A final report and associated products will be submitted between June 30 and August 15, 2022

**IX. SEE ADDITIONAL WORK PLAN COMPONENTS:**

- A. Budget Spreadsheet**
- B. Visual Component or Map**
- C. Parcel List Spreadsheet N/A**
- D. Acquisition, Easements, and Restoration Requirements N/A**
- E. Research Addendum**

Attachment A:  
 Environment and Natural Resources Trust Fund  
 M.L. 2019 Budget Spreadsheet



Legal Citation:  
 Project Manager: Dr. Nicholas McCann  
 Project Title: Mapping habitat use and disease of urban carnivores  
 Organization: University of Minnesota  
 Project Budget: \$500,000  
 Project Length and Completion Date: 3 years; June 30, 2022  
 Today's Date: August 20, 2018

ENVIRONMENT AND NATURAL RESOURCES TRUST FUND BUDGET	Budget	Amount Spent	Balance
<b>BUDGET ITEM</b>			
<b>Personnel (Wages and Benefits)</b>	\$ 377,294	\$ -	\$ 377,294
University of Minnesota Graduate Research Assistant, \$44,970 (58% salary, 42% benefits) 50% FTE for 1 year			
University of Minnesota Graduate Research Assistant, \$96,108 (56% salary, 44% benefits) 50% FTE for each of 2 years			
University of Minnesota Undergraduate Intern, \$5,880 (100% salary, 0% benefits) 4% FTE for each of 2 years			
University of Minnesota Postdoctoral Research Assistant, \$205,298 (81% salary, 19% benefits) 100% FTE for each of 3 years			
University of Minnesota Faculty Member, \$12,908 (75% salary, 25% benefits) 8% FTE for 1 year			
University of Minnesota Faculty Member, \$12,130 (75% salary, 25% benefits) 8% FTE for 1 year			
<b>Professional/Technical/Service Contracts</b>			
Service contract for testing 45 biological samples for 8 diseases at University of Minnesota diagnostic laboratories (\$13,095)	\$ 13,095	\$ -	\$ 13,095
Service contract for analysis of diet composition at stable isotope laboratory; competitive process will be used to identify a laboratory (\$1,350)	\$ 1,350	\$ -	\$ 1,350
Service contract for GPS collar data downloads; competitive process will be used to identify a provider (\$21,600)	\$ 21,600	\$ -	\$ 21,600
Professional contract for locating foxes and coyotes and accessing private properties in the Metro area; contract to be with Friends of the Mississippi River (\$5,630).	\$ 5,630	\$ -	\$ 5,630
<b>Equipment/Tools/Supplies</b>			
Equipment for fieldwork and managing biological samples, including pharmaceuticals and traps (\$5,490)	\$ 5,490	\$ -	\$ 5,490
GPS collars for red and gray foxes (30 collars @ \$1,512 per collar = \$45,360); GPS collars for coyotes (15 collars @ \$1,470 per collar = \$22,050)	\$ 67,410		\$ 67,410
<b>Travel expenses in Minnesota</b>			
Vehicle mileage for locating, capturing, and monitoring study animals, delivering presentations, and meeting with collaborators in Minnesota (14,920 miles @ \$0.545 per mile = \$8,131)	\$ 8,131	\$ -	\$ 8,131
<b>Other</b>			
	\$ -	\$ -	\$ -
<b>COLUMN TOTAL</b>	\$ 500,000	\$ -	\$ 500,000

OTHER FUNDS CONTRIBUTED TO THE PROJECT	Status (secured or pending)	Budget	Spent	Balance
<b>Non-State:</b> UMN FWCB Club	Pending	\$ 13,400	\$ -	\$ 13,400
<b>State:</b>		\$ -	\$ -	\$ -
<b>In kind:</b>		\$ -	\$ -	\$ -

PAST AND CURRENT ENRTF APPROPRIATIONS	Amount legally obligated but not yet spent	Budget	Spent	Balance
<b>Current appropriation:</b> M.L. 2016, Chp. 186, Sec. 2, Subd. 03l; Restoration of Elk to Northeastern Minnesota; Dr. Nicholas McCann is the Postdoctoral Associate for this project		\$ 300,000	\$ 118,006	\$ 181,994
<b>Past appropriations:</b>		\$ -	\$ -	\$ -



**Urban foxes and coyotes: Mapping their habitat use, diet, and disease prevalence to identify locations of potential conflict with people**

