NHDOT SPR2 PROGRAM
RESEARCH PROGRESS REPORT

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Project # 42372P		**Report Period** Year 2024 ☐ Q1 (Jan-Mar) X Q2 (Apr-Jun) ☐Q3 (Jul-Sep) ☐ Q4 (Oct-Dec)
Project Title: Wildlife Vehicle Collisions Data Gathering and Best Management Practices Part 2		
Project Investigator: Remington Moll, University of New Hampshire **Phone:** 603-862-3054 **E-mail:** remington.moll@unh.edu		
Project Start Date: 6/14/2023	**Project End Date:** 6/30/2025	**Project schedule status:** X On schedule ☐ Ahead of schedule ☐ Behind schedule

Brief Project Description:

Wildlife vehicular collisions (WVCs) pose inherent threats to wildlife populations and human safety throughout the State. Roads create barriers that reduce free movements of wildlife species. Plymouth State University Wildlife Vehicle Collisions Data Gathering and Best Management Practices Study (Part 1) has synthesized the available data about WVCs in NH and developed a statistical model to analyze road, temporal, and wildlife specific factors that contribute to areas with more collisions. The study found positive relationships between WVCs and local road density, which corresponds to population centers within the state. However, it also revealed that there is more variability and less predictability in the data than was expected.

This research will refine the model and complete on-the-ground research to identify some hot spots where mitigation should be considered in New Hampshire. The proposed research includes:

- Continuing data analysis from Part 1 of the project,
- Using cameras, wildlife tracking, or roadkill surveys to evaluate the presence of wildlife and analyze the data to identify locations for WVC mitigation projects,
- Investigate the 23 USC 171: Wildlife crossings pilot program and make recommendations to the Technical Advisory Group,
- Develop a guidance document for Wildlife Crossing Best Management Practices (BMPs)
- Facilitate a meeting to include NHDOT personnel from Operations, Project Development and NH F&G to workshop a crossing project proposal.

The project could result in design features to mitigate WVCs in the vicinity of WVC hot spots and future stand-alone projects to reduce WVCs. The BMP manual could lead to reduced WVCs throughout New Hampshire, providing a safer travelling environment for drivers and for wildlife.

Progress this Quarter (include meetings, installations, equipment purchases, significant progress, etc.):

- The UNH graduate student leading field aspects of the project, Clara Dawson, completed her second semester in the M.S. degree program in Wildlife and Conservation Biology at the University of New Hampshire (UNH) under the supervision of project PI Remington Moll. Clara successfully defended her thesis proposal in May. Committee members are Dr. Amy Villamagna of Plymouth State University and Dr. Fikirte Erda of UNH.
- Clara Dawson had two poster presentations accepted: one will be presented at the 2024 Northeastern Transportation and Wildlife Conference in September 2024 and the other at The Wildlife Society Annual Conference in October 2024. These poster presentations will focus on initial results from the camera monitoring of collision hotspots. The presentation details are included in the Appendix.
- Clara Dawson provided three presentations covering ongoing work. The presentation details are included in the Appendix.
- We are analyzing image data collected from 74 camera traps deployed at 12 hotspot wildlife-vehicle collision sites. All fall 2023 camera trap photo data has been processed and spring 2024 data has been processed for 4 of the 12 hotspots. Cameras remain deployed at these sites. A summary of initial wildlife detections during fall 2023 for each hotspot is provided in the Appendix.

- Clara Dawson, Remington Moll, and Amy Villamagna continued the analysis of the relationship between wildlife connectivity maps produced by the New Hampshire Fish and Game Department with wildlife-vehicle collision hotspots. This analysis will help determine the degree to which habitat connectivity predicts collisions.
- Remington Moll delivered a presentation to the Technical Advisory Group (TAG) on May 30,2024. Following discussion and input from the TAG, it was decided that 2 additional field sites will be monitored via camera traps, beginning in summer 2024. These sites are the Farrar site on US Route 2 and the 89-93 interchange on the southwest side of Concord.
- Remington Moll attended the June New Hampshire Transportation and Wildlife Workgroup meeting in Concord. A preliminary timeline for the meeting to workshop a crossing proposal was discussed, with a tentative target date of spring 2025.
- Remington Moll and Amy Villamagna attended a meeting led by Matthew Thorne (The Nature Conservancy) regarding plans to use the Survey123 application ROaDS Roadkill Survey to collect data on statewide road wildlife mortalities. Meeting participants expressed interest in using the application and expressed that resources to use the application effectively could be included in plans for the next Wildlife Crossings Pilot Program grant application.

Items needed from NHDOT (i.e., Concurrence, Sub-contract, Assignments, Samples, Testing, etc…):

None at this time.

Anticipated research next three (3) months:

- Deploy 2 new field monitoring sites (Farrar site and 89-93 Concord interchange)
- Complete camera trap image analysis of year 1
- Continue analysis of land connectivity maps to evaluate their relevancy for predicting wildlife-vehicle collisions. These efforts will inform the Best Practices document as well as help guide applications to the Wildlife Crossings Pilot Program.
- Draft a timeline for a meeting to bring together personnel from various organizations, including UNH, DOT, and NHFG, to workshop a crossings proposal
- Continue literature review for Best Management Practices document.

Circumstances affecting project:

One camera was removed as evidence in a traffic accident in Newbury by the Newbury police department. The initial attempt to reach the point of contact was unsuccessful – we will follow up to retrieve this camera and its data.

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
Continue data analysis from Part 1 of the project (hotspot mapping) (2023 Q3)	*100*	*100*
Field monitoring of hotspot locations (2023 Q3 - 2025 Q1)	*100*	*100*
Investigate the 23 USC 171: Wildlife crossings pilot program and make recommendations (2024 Q1 – 2024 Q4)	*20*	*20*
Analyze ancillary data (wildlife habitat maps) to inform mitigation analysis (2023 Q4 – 2025 Q1)	*60*	*60*
Analyze field data to inform mitigation analysis (2023 Q2 – 2025 Q1)	*25*	*25*
Develop Best Management Practices document (2024 Q1 – 2024 Q3)	*10*	*5*
Facilitate a meeting to include NHDOT personnel from Operations, Project Development and NH F&G to inform crossing project proposal (2023 Q4, 2024 Q4)	*40*	*10*
Update StoryMap from Phase 1 (2023 Q4 – 2025 Q2)	*0*	*0*

Write technical report (2025 Q2)	*0*	*0*
Present results and prepare manuscript for publication (2024 Q3 – 2025 Q2)	*0*	*0*

Barriers or constraints to implementing research results

None at present.

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Appendix: Tables and Product Lists.

Site	Bob	Bear	Beav	Coy	Deer	Fishe	Grfx	Moos	Opp	Ott	Porc	Rac	Rdfx	Strsk
471	3	0	2908	9	85	0	27	0	9	37	0	2424	46	6
96289	0	0	18	0	9	0	6	0	0	0	0	3	0	0
106527	20	11	17	24	51	27	0	0	129	8	118	829	24	22
12924	0	0	0	26	9	0	0	0	11	10	0	96	0	9
226	26	5	0	0	0	0	11	0	0	29	0	1804	10	12
624	33	3	108	21	90	0	0	0	52	0	0	369	15	0
93607	0	0	0	0	27	0	0	3	0	0	3	12	0	0
515	0	0	9	12	136	6	9	0	32	0	0	66	6	6
98140	0	0	6	15	87	3	0	0	6	3	0	198	6	0
93749	3	7	0	0	3	0	0	7	0	0	0	0	0	0
4180	24	0	9	0	18	0	0	0	0	3	0	39	34	21
3689	0	0	0	0	16	0	0	0	0	15	0	0	3	0
Total	**109**	**26**	**3075**	**107**	**531**	**36**	**53**	**10**	**239**	**105**	**121**	**5840**	**144**	**76**

Table 1. Number of camera trap detections of target species at 12 hotspot sites during fall 2023. Abbreviations**:** Bob = bobcat (*Lynx rufus*); Bear = black bear (*Ursus americanus*); Beav = beaver (*Castor canadensis*); Coy = coyote (*Canis latrans*); Deer = white-tailed deer (*Odocoileus virginianus*); Fishe = fisher (*Pekania pennanti*); Gyfx = gray fox (*Urocyon cinereoargenteus*); Moos = moose (*Alces alces*); Opp = Virginia opposum (*Didelphus virginiana*); Ott = river otter (*Lontra canadensis*); Porc = porcupine (*Erethizon dorsatum*); Rac = raccoon (*Procyon lotor*); Rdfx = red fox (*Vulpes vulpes*); Strsk = striped skunk (*Mephitis mephitis*)

Presentations

C.R. Dawson, A.M. Villamagna, R.A. Martin, R.J. Moll. 2024. Did the mammal cross the road? Identifying and monitoring of collision hotspots across New Hampshire. The Wildlife Society Annual Conference, Baltimore, MD, USA. Poster. (Scheduled for October 2024)

C.R. Dawson, A.M. Villamagna, R.A. Martin, R.J. Moll. 2024. Did the mammal cross the road? Identifying and monitoring of collision hotspots across New Hampshire. Northeastern Transportation and Wildlife Conference, Mystic, CT, USA. Poster. (Scheduled for September 2024)

C.R. Dawson and R.J. Moll. 2024. Can the mammal cross the road? Three-Minute Thesis Competition, Durham, NH, USA. Oral.

C.R. Dawson and R.J. Moll. 2024. Can the mammal cross the road? An assessment of wildlife connectivity and vehicle collisions across New Hampshire. Natural Resources and the Environment Spring Seminar Series, Durham, NH, USA. Oral.

C.R. Dawson and R.J. Moll. 2024. Can the mammal cross the road? An assessment of wildlife connectivity and vehicle collisions across New Hampshire. University of New Hampshire Graduate Research Conference, Durham, NH, USA. Oral.

Publications

M. K. P. Poisson, A. R. Butler, C. R. Dawson, A. T. Ford, T. S. Readyhough, J. K. Scherger, and R. J. Moll. In press. Lethal effects of roads on large carnivores. In: Apex predators in the Anthropocene: How humans shape large carnivore populations, R. A. Montgomery and R. J. Moll, editors. Oxford University Pres