NHDOT SPR2 PROGRAM
RESEARCH PROGRESS REPORT

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Project # 42372P		**Report Period** Year 2024 ☐ Q1 (Jan-Mar) ☐ Q2 (Apr-Jun) X 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, presented a poster at the 2024 Northeastern Transportation and Wildlife Conference in September. The poster was well-received by attendees. Presentation details are included in the Appendix.
- Dr. Amy Villamagna of Plymouth State University submitted an abstract on this project's work to the 2025 International Conference on Ecology and Transportation, scheduled for May 2025 in Denver, CO, USA.
- We deployed 2 new field monitoring sites, the Farrar site on Route 2 and a collision hotspot at the 89-93 Concord interchange. Each site received 5-6 cameras and data collection is ongoing. These additional sites were chosen in coordination with the TAG and partners working on the Farrar site crossing (NH Audubon, Northeast Conservation Services).
- Moll collaborated with Pete Steckler of Northeast Conservation Services to propose and support a monitoring plan, based upon the study design of this project, for the Farrar site on Route 2, should funding be secured to perform mitigation at that site.
- We continued work on the Best Management Practices guide and began exploring the potential to apply/adapt

the VT Terrestrial Passage Screening tool for use in NH.

- We are analyzing image data collected from 74 camera traps deployed at 12 hotspot wildlife-vehicle collision sites. All camera trap photo data from the fall 2023 and spring 2024 field checks have been processed and data from the summer 2024 field checks have been processed for 3 of the 12 hotspots. Cameras remain deployed at these sites. A summary of initial wildlife detections during fall and spring 2024 for each hotspot is provided in the Appendix.
- Dawson, Moll, and 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. The analysis is nearly complete and Dawson and Moll are working on a manuscript that will comprise chapter 1 of Dawson's M.S. chapter, which will eventually be submitted for publication in a peer-reviewed journal.
- Dawson coordinated field visits to all active camera sites to download data and perform maintenance.

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

We request assistance acquiring the 2022 and 2023 vehicle collision dataset. Villamagna has submitted multiple requests since April 2024 with no response.

Anticipated research next three (3) months:

- Dawson will present research from this project at The Wildlife Society Annual Conference in October 2024. Dawson and Moll will attend that conference.
- Complete hotspot-connectivity map analysis.
- Continue work on Best Management Practices document.
- Identify personnel from various organizations, including UNH, DOT, and NHFG, to invite to workshop a crossings proposal in spring/summer 2025.

Circumstances affecting project:

1. One camera was removed as evidence in a traffic accident in Newbury by the Newbury police department. We have retrieved the camera and data and a technician on the project re-deployed the camera back at the Newbury site to continue data collection.

2. Two cameras were illegally removed by a landowner in Ossipee. We coordinated with law enforcement to retrieve the cameras but have yet to receive the data. We will continue to pursue this issue, working with law enforcement. In response to this landowner, we terminated data collection from two of the cameras and relocated a third camera to avoid conflict.

3. Two cameras were removed by a New Hampshire Fish and Game employee, following concerns brought forth by a local resident. The cameras have been recovered and redeployed, but we have yet to receive the data. Fish and Game have been helpful in resolving this and we will pursue this issue in the next quarter to recover the 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)	*25*	*25*
Analyze ancillary data (wildlife habitat maps) to inform mitigation analysis (2023 Q4 – 2025 Q1)	*75*	*90*

Analyze field data to inform mitigation analysis (2023 Q2 – 2025 Q1)	*35*	*40*
Develop Best Management Practices document (2024 Q1 – 2024 Q3)	*15*	*10*
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*	*15*
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)	*5*	*10*

Barriers or constraints to implementing research results

None at present besides the missing data issues described above.

Appendix: Tables and Product Lists.

Site	Bear	Bob	Coy	Deer	Fishe	Grfx	Lago	Moos	Opo	Porc	Rac	Rdfx	Strsk	Turk
471	0	1	5	18	0	34	14	0	7	0	238	21	2	0
96289	0	2	0	8	0	2	0	0	2	0	5	1	1	2
106527	4	9	11	35	6	1	25	0	119	68	141	14	4	6
12924	0	0	20	6	0	0	0	0	4	0	25	14	3	1
226	3	10	0	0	0	11	0	0	1	1	239	7	8	0
624	1	10	7	30	0	0	1	0	11	0	80	5	0	0
93607	0	0	1	13	0	0	0	1	0	1	10	4	0	0
515	0	4	6	117	4	3	0	0	12	0	45	2	3	3
98140	0	0	11	31	2	0	0	0	1	2	58	3	0	2
93749	4	6	0	4	0	0	1	5	0	0	0	7	0	1
4180	0	6	0	9	0	0	0	0	2	0	19	34	7	5
3689	0	0	0	6	0	0	0	0	0	0	0	0	1	0
Total	**20**	**52**	**62**	**286**	**12**	**51**	**41**	**6**	**162**	**72**	**883**	**126**	**28**	**20**

Table 1. Number of camera trap detections of target species at 12 hotspot sites during fall 2023 (Sep 1-Nov 30) and spring 2024 (March 15-June 15). Note: only sites 471, 96289, and 106527 have complete fall and spring species counts; counts for the remaining 9 sites do not include data from May or June, 2024 as they are still in the progress of being tagged. Abbreviations**:** Bear = black bear (*Ursus americanus*); Bob = bobcat (*Lynx rufus*); Coy = coyote (*Canis latrans*); Deer = white-tailed deer (*Odocoileus virginianus*); Fishe = fisher (*Pekania pennanti*); Gyfx = gray fox (*Urocyon cinereoargenteus*); Lago = Lagomorpha (eastern cottontail/snowshoe hare); Moos = moose (*Alces alces*); Opo = Virginia opossum (*Didelphus virginiana*); Porc = porcupine (*Erethizon dorsatum*); Rac = raccoon (*Procyon lotor*); Rdfx = red fox (*Vulpes vulpes*); Strsk = striped skunk (*Mephitis mephitis*), Turk = turkey (*Meleagris gallopavo*)

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. Can the mammal cross the road? Ground-truthing wildilfe use of collision hotspots using camera traps. Northeastern Transportation and Wildlife Conference, Mystic, CT, USA. Poster.

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 Press.