VERMONT
AGENCY OF TRANSPORTATION

2017 Research Symposium & STIC Annual Meeting

FACT SHEET

Reducing Wildlife Mortality on Roads in Vermont: Determining relationships between structures attributes and wildlife movement frequency through bridges and culverts to improve conservation investments

RESEARCH PROJECT TITLE

Reducing Wildlife Mortality on Roads in Vermont: Determining relationships between structures attributes and wildlife movement frequency through bridges and culverts to improve conservation investments

STUDY TIMELINE

January 2014 – October 2016

PRINCIPAL RESEARCHERS

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MORE INFORMATION

This fact sheet was prepared for the 2017 VTrans Research Symposium & STIC Annual Meeting held **on September 28, 2017** at National Life in Montpelier, VT. 8:00 am– 12:00 pm.

Fact sheets can be found for additional projects featured at the 2017 Symposium at http://vtrans.vermont.gov/planning/research/2017symposium

Additional information about the **VTrans Research Program** can be found at http://vtrans.vermont.gov/planning/research

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Introduction

Road corridors fragments wildlife habitat, and wildlife need to cross busy roads to move between valuable habitats, endangering both wildlife and highway users. We assessed wildlife use of culverts and bridges to clarify relationships between structural dimensions and frequency of wildlife use of transportation structures. Study results characterized wildlife transportation structure use in terms of structure and site characteristics that can be used to identify opportunities to modify transportation structures to increase their usability by wildlife.

Methodology

We assessed wildlife through-passage frequency at culverts and bridges designed for fluvial conveyance in order to clarify relationships between structural dimensions and frequency of wildlife use of transportation structures. Eighty-four game cameras were set up at 23 culverts/bridge sites on State, US, and Interstate highways in Vermont that were located within road corridor segments identified by connectivity modeling as important for regional habitat connectivity. We selected bridges and culverts that were most likely to be used by non-rodent terrestrial mammals that 1) were in close proximity to large habitat blocks on both sides of a road corridor; 2) had at least one consistently dry "movement surface" available through the structure; 3) no "fatal flaws" and apparent suitability for use by at least two moderate to high mobility "movement guilds" of terrestrial mammals according to a version of the Passage Assessment System (Kintsch and Cramer, 2011) modified for Vermont (Shilling et al 2012). Study sites were broadly representative of the range of sizes and types of transportation structures used on road networks in the northeast that are larger than 3' wide (large bridge spans, box culverts, arch culverts, and pipe culverts). At six of the 23 sites, we also collected game camera data on wildlife presence in habitat near monitored structures.

Conclusion

Overall, 573 "passage events" through bridges/culverts of 13 moderate/wide ranging "focal" mammal species (excluding rodents, raccoon, woodchuck, and domestic pets) were recorded over nearly 40,000 camera monitoring days. While all but one of our sites were used by focal species to move under roadways, there was a substantial amount of variation in the frequency of use among sites, and 10 of the 23 sites yielded surprisingly low through-passage frequencies.

What are potential impacts?

Species use/structure size relationships were consistent with a modified "Movement Guild" framework in terms of species detected in this study (with notable absence of through-passage detections for larger focal species: black bear and moose). Also, local-scale structural connectivity of forest habitat and availability of dry movement surfaces appeared to explain some of the between-site variation in through-passage frequency data. Our results improve our understanding of wildlife transportation structure use in ways that can assess the benefits of conservation investments.