VERMONT
AGENCY OF TRANSPORTATION

FACT SHEET

Ranking Transportation Structures by their Potential to Facilitate Wildlife Passage: A Connectivity Modeling Approach

PROJECT TITLE
Ranking Transportation Structures by their Potential to Facilitate Wildlife Passage: A Connectivity Modeling Approach

STUDY TIMELINE
December 2019–September 2021

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More information about the VTrans Research Program, including additional Fact Sheets, can be found at:
http://vtrans.vermont.gov/planning/research

Problem Statement

Landscape connectivity is important for the persistence of wildlife populations. Roadways fragment the landscape and often act as barriers to wildlife movement; however, transportation structures can add permeability to the landscape. Our goal is to determine the wildlife connectivity value of state-managed structures.

Methodology

We are using a circuit theory approach to visualize connectivity, which treats the movement of animals like the flow of electricity through a circuit. Each component of the landscape is scored with a resistance value, and the flow of electricity through the landscape is quantified. The resulting maps depict wildlife movement across the state. We plan to conduct a connectivity analysis for 8 species, such as bear, moose, and deer at a broad landscape scale and a structure scale. Results will allow us to score each structure by its value for large-scale landscape connectivity and fine-scale site-level connectivity. The study builds on game camera data collected in earlier phases of the project and synthesizes species occupancy models, and FIA, NLCD, and lidar data.
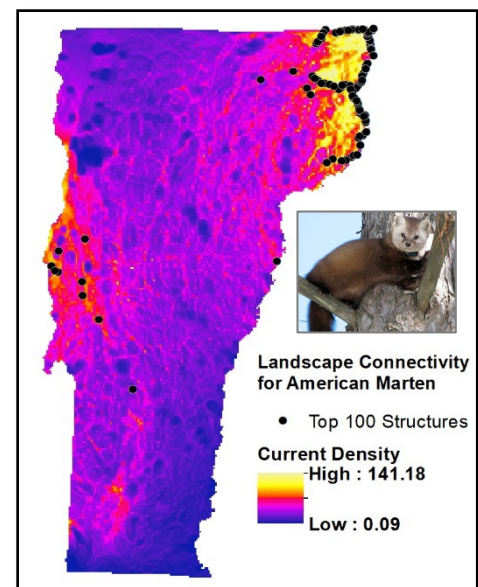
Marten movements predicted from a circuit-based analysis along with the top 100 highest ranking structures for connectivity.

Next Steps

The project is in its first year and has focused on data collection and connectivity model development to-date. We anticipate completing the full connectivity analysis for each focal species and ranking structures according to their landscape and structure connectivity values in year 2.

Potential Impacts and VTrans Benefits

The project will provide a ranking of the connectivity value of over 6,000 transportation structures for high priority terrestrial wildlife. The analysis will also result in maps of wildlife connectivity for each structure. The primary benefit to VTrans is that the outputs will provide information on connectivity that can be incorporated into decision-making about the management of transportation structures. Our results will be integrated into a comprehensive Terrestrial Organism Passage Screening Tool for VTrans biologists, managers, and decision-makers.