![Vermont Agency of Transportation logo]

FACT SHEET

Ranking Transportation Structures by their Potential to Facilitate Wildlife Passage

PROJECT TITLE
Ranking Transportation Structures by their Potential to Facilitate Wildlife Passage

STUDY TIMELINE
December 2019 – September 2021

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KEYWORDS
Wildlife, connectivity, transportation structures, circuit theory

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 was to determine the wildlife connectivity value of state-managed structures.

Methodology

We conducted an analysis of transportation structures to determine their connectivity value for eight terrestrial mammal species. Our approach combined data on structure attributes, landcover, protected lands, and wildlife occupancy and expert opinion data to assign a connectivity score to each structure. We modeled wildlife movement at two spatial scales using a circuit theory approach. This method treats the movement of animals as the flow of electricity through a circuit, and the mean electricity around each structure was used as a measure of connectivity. Additionally, we used a linear programming decision-making framework to create a Terrestrial Organism Passage Screening Tool. This tool provides a final, more comprehensive score for structures by integrating the results of the circuit modeling with data on structure attributes and human development metrics.

Conclusions

We analyzed the connectivity value of 5,912 transportation structures (>3ft diameter). We generated species-specific maps of wildlife movement at two spatial scales and used an all-species combined model for final scoring. Structures were scored based on multiple criteria, and this information will be available in the Terrestrial Organism Passage Screening Tool at the end of the project.

Potential Impacts and VTrans Benefits

Our assessment provides insight into transportation structures that are in high priority areas of wildlife movement in Vermont. Connectivity scores will inform decision making about the management of transportation structures. Structures located in areas of high wildlife movement may benefit from wildlife-based improvements, and the Terrestrial Organism Passage Screening Tool will help transportation managers identify these locations.
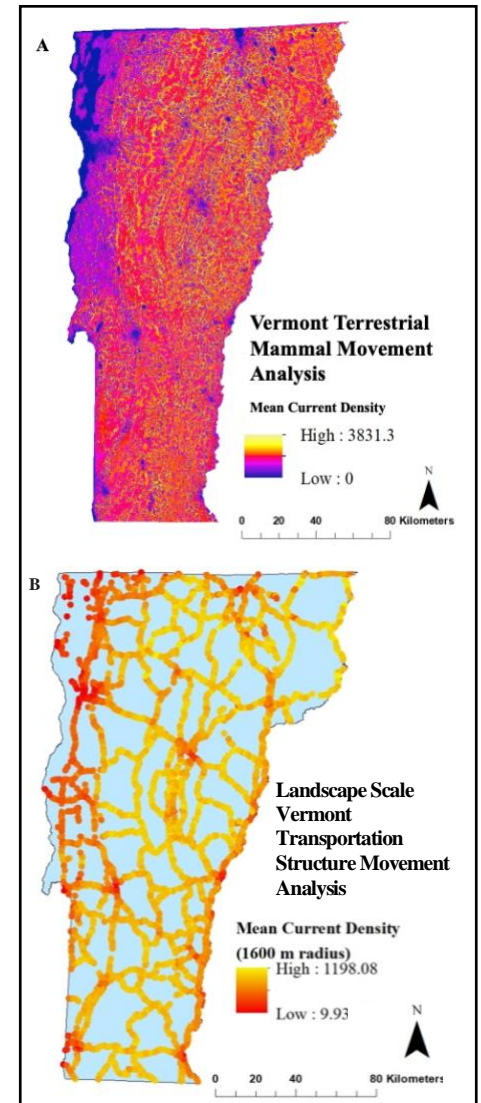
A) Depiction of expected wildlife movement estimated using circuit theory. B) Preliminary ranking of transportation structures in the landscape-scale circuit theory analysis.