

Report 27-R01: Evaluating Bat Use of Culverts in Virginia and Opportunities to Streamline Consultation for VDOT Projects

Background

Transportation projects in Virginia frequently require coordination with the U.S. Fish and Wildlife Service (USFWS) to address the potential effects on federally listed bat species. Although existing tools provided by USFWS and the Federal Highway Administration provide effective pathways for many projects, individual coordination is still needed to address some projects, and -workload demands are associated with the guidance. Structure assessments for bats represent one area of a substantial workload. Although project-specific investigations of bat use of structures have been conducted in Virginia, there have been no systematic, statewide studies to quantify culvert use.

Research Objectives

This study evaluated opportunities to improve the efficiency and consistency of bat-related coordination through two complementary components: (1) development of a structured framework to guide a follow-up culvert field study intended to better inform culvert survey requirements and decision-making; and (2) evaluation of broader streamlining opportunities through interviews with Virginia Department of Transportation (VDOT) staff, Virginia-based USFWS staff, and state DOT and USFWS field office representatives from six other states.

Approach

To meet the first objective of designing a targeted sampling plan for a follow-up culvert field study, researchers evaluated information from the literature, VDOT's structure inventories, and bat survey records to identify key factors influencing bat occupancy and to support the development of a culvert sampling framework for a follow-up culvert field study.

For the second objective, interviews were conducted with 18 practitioners to inform potential pathways for streamlining and improving the efficiency of the consultation process for VDOT projects.

Outcomes

Literature and structure assessment data indicate that bat use of certain culverts is rare and primarily associated with larger concrete structures, with limited evidence of use in smaller or metal culverts that comprise the majority of VDOT's inventory.

Interviews highlighted some common challenges across VDOT and USFWS staff, and the findings indicate that near-term improvements can be achieved by improving the consistency and clarity of project submittals, identifying project types for streamlining by tracking those that require additional coordination, and initiating the development of a streamlined approach for tree cutting.

Research Benefits

The culvert sampling framework developed for the statewide culvert field study will provide a systematic basis for evaluating culvert occupancy and informing future survey guidance and streamlining decisions.

The report also provides a framework for improving coordination efficiency while supporting data-informed, long-term streamlining strategies.

Principal Research Scientists

Bridget M. Donaldson

Associate Principal Research Scientist

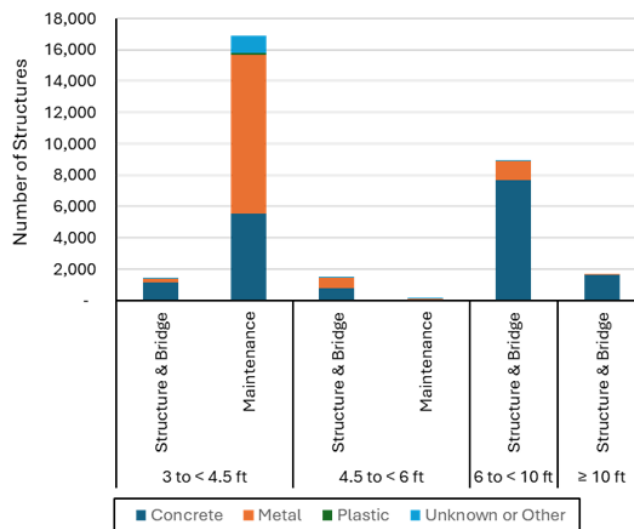
Jonathan C. Luu

Research Assistant

Research Findings

Field Sampling Framework

More than 30,500 culverts meet the USFWS minimum size and length thresholds for bat assessments. Metal culverts represent the largest proportion of VDOT's culvert inventory (34%), but assessment data indicate that bat use is extremely rare in this culvert type. These findings were used to develop a structured culvert sampling framework for a follow-up field study that will provide a systematic basis for evaluating culvert occupancy and informing future survey and streamlining decisions.



The number of VDOT culverts that meet the size thresholds in the USFWS's Bat Survey Guidelines, grouped by culvert opening size and culvert material

Streamlining Opportunities

Streamlining can be achieved through a combination of near-term actions and longer-term, data-informed efforts. A structured approach for recurring activities, such as tree cutting, could improve efficiency by defining a limited number of scenarios, establishing thresholds for streamlined pathways, and applying standardized conservation measures.

