

# Assessing and Optimizing a Rapid Road-Crossing Protocol for Aquatic Organismal Passage

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## Abstract

For decades managers have sought to mitigate the effects of fragmentation on wildlife. In aquatic ecosystems, fragmentation strongly affects headwater streams due to the architecture of riverine networks and the abundance of road crossing culverts. Standardized road crossing assessments offer an alternative to historical methods in facilitating the identification and prioritization of barriers for restoration. However, the ecological relevance of these assessments are seldom empirically investigated, and most assessments assume homogenous environmental and biotic conditions observed during snapshot surveys. Our goal was to assess both the efficacy and assumptions of the widely adopted Southeastern Resource Aquatic Partnership's (SARP AOP) Road Crossing Assessment for predicting fish passage. We used model selection of generalized linear mixed models to compare SARP AOP scores to observed movement calculated through mark-recapture. We also compared the SARP AOP score with a modified version of the score that included alterations to better reflect local environmental conditions. Although limited in scope, our results suggest an overall lack of support for the efficacy of the SARP AOP score in predicting fish passage and only marginal improvements under the modified score. This study is an important first step in our ability to modify standardized score calculations to increase efficacy without additional surveys. Regardless of the scoring framework efficacy, standardized road crossing surveys remain highly useful in collecting information related to potentially harmful structures (i.e., failing infrastructure). Future studies should further explore how to improve the efficacy of these assessments, which represent a promising tool to facilitate efficient and effective restoration.

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