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Authors

Woltz, Hara
Gibbs, James P.

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ROAD-CROSSING STRUCTURES FOR AMPHIBIANS AND REPTILES: INFORMING DESIGN THROUGH BEHAVIORAL ANALYSIS

Hara Woltz (212-729-6887, hara@harawoltz.com), Nelson Byrd Woltz Landscape Architects, 276 Riverside Drive, No. 11B, New York, NY 10025 USA

James P. Gibbs (315-470-6764, jpgibbs@esf.edu), Associate Professor, Conservation Biology/Wildlife Management, State University of New York, College of Environmental Science and Forestry, 247 Illick Hall, 1 Forestry Drive, Syracuse, NY 13210, Fax: 315-470-6934 USA

Abstract

Seasonal movements are fundamental to the life cycles of many species of amphibians and reptiles. These patterns of migration can be compromised by the presence of roads. Roads negatively impact many amphibian and reptile populations in various ways, such as obstructing movement, fragmenting and degrading habitats and causing increased mortality through vehicular contact. Road crossing structures provide one possible way to mitigate the negative effects of roads and facilitate safe passage for these organisms. However, if crossing structures are to be effective, animals must be willing to use them. Through a series of behavioral choice experiments, we examined whether certain aspects of structural design might influence animal preferences for particular crossing structures. We tested four qualities of possible under-road crossing structures: aperture size, substrate material, length, and light availability. For these qualities, we evaluated the responses of individuals from four species: northern green frogs (*Rana clamitans*), leopard frogs (*Rana pipiens*), painted turtles (*Chrysemys picta*), and snapping turtles (*Chelydra serpentina*). Results indicate that for particular organisms, specific variables did seem to influence patterns of choice. In the aperture treatment, the choices of painted turtles, snapping turtles, and leopard frogs indicate that pipe diameter exerts a significant influence on choice. The substrate treatment indicated that green frogs have a significant preference for soil and gravel over other materials. Overall, these results elucidate important considerations for the design of behaviorally palatable crossing structures.