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ECOLOGICAL EFFECTS OF ROADS ON HERPETOFAUNA: UNDERSTANDING BIOLOGY AND INCREASING COMMUNICATION ARE CRITICAL FOR WILDLIFE CONSERVATION

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Abstract

Roads are the ultimate manifestation of urbanization, providing essential connectivity within and between rural and heavily populated areas. The ecological impacts roads have on herpetofauna across temporal and spatial scales are profound, beginning during the early stages of construction and progressing through to completion and daily use. Herpetofauna have the potential to be negatively influenced from roads as a consequence of urbanization, either directly from on-road mortality or indirectly as a result of a variety of ecological impacts and enabled human accessibility. The quantity and the potential severity of indirect impacts of roads and urban development on amphibians and reptiles far exceed those incurred from direct mortality of wildlife although our understanding of these indirect consequences is premature. As the amount of research on the impacts of roads on reptiles and amphibians increases, scientists find themselves at a stage where determining the appropriate management and conservation direction is critical. While many road impacts have long-term effects, researchers are hampered by the inevitable time constraints imposed by funding agencies and, in the instance of many reptiles, the human life span in relation to their study organism. These complications are subsequently confounded by the necessity to prioritize research. Having science-based conservation decisions answer all questions on all species in all locations over a variety of spatio-temporal scales would be ideal, but is not achievable. The difficulty of long-term complex studies can be mitigated by performing shorter-term or smaller studies that elucidate general trends while specifying areas of research prioritization. Further, an examination of basic biological parameters of organisms can direct areas of susceptibility to road effects that assist in prioritization of research topics and focal species. This synthesis is indicative of the research mileage that can be covered when using multiple studies to assess an ecological issue. Lastly, while some on-road mortality can be minimized in some instances for some species with road crossings, the mitigation of indirect effects such as pollution cannot be accomplished with these measures. In light of the many indirect effects that have been identified and the many more that remain to be documented, proactive transportation planning, public education, and communication among the professional sectors of society are the most effective way to minimize and mitigate road impacts and the *only* effective mechanism for avoidance of road impacts.

For more information on the situation at Savannah River Ecology Lab, a partner in road research, please visit: www.savesrel.org