

No more deer in the headlight: Study finds large mammals do use road crossing structures

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Large mammals crossing US Highway 93 are more likely to use wildlife crossing structures than move past a random location in the surrounding habitat, new research shows. The research team also found that animal movement varied between crossing structures in different locations, suggesting that location might be more important than design. The findings, published in open-access journal *Frontiers in Ecology and Evolution*, are a first step towards a better understanding what makes road crossing structures effective.

The researchers evaluated the effectiveness of [wildlife](#) crossing structures along Highway 93 in Flathead Indian Reservation, Montana, USA to find out how wildlife move through crossing structures relative to the surrounding habitat, and to assess the effect of the structures' [location](#). With the help of motion-sensing trail cameras placed at the entrances of 15 arch-style wildlife underpasses and spread throughout the adjacent habitat, the researchers could monitor and measure the movement of large mammal species through and around the crossing structures during a 6-months period.

The data showed that overall, [large mammals](#) (all species combined) were 146% more likely to use the crossing structures than to pass at a random location in the surrounding habitat. At the species level, white-tailed deer and mule deer were particularly likely to use the underpasses, whereas carnivorous species such as black bear and coyote moved

through the passages at a similar rate to passing at a random location in the surrounding area.

This indicates that the structures were successful at improving or maintaining the habitat connectivity for wildlife across the barrier created by the highway. The research team also found that [animal movement](#) through the crossing passages varied between different locations, suggesting that location might be more important than design.

The negative effects of roads and traffic on wildlife habitats and populations are well documented. These range from direct effects such as habitat degradation and fragmentation to direct injury and mortality due to collisions with vehicles while crossing roads.

"In recent decades, an increasing number of highway construction and reconstruction projects have included mitigation measures aimed at reducing wildlife-vehicle collisions and maintaining [habitat connectivity](#) for wildlife," says one of the study's authors, A. Z. Andis from Yale University, USA.

However, because of the size and cost of wildlife crossing structures, it has been difficult for researchers to obtain a detailed understanding of the relative importance of the design and placement of crossings. Moreover, most wildlife mitigation projects are not designed to contribute novel data.

"To date, there are only very few studies that have assessed the effectiveness of crossing structures based on a rigorous comparison to animal abundance in the surrounding [habitat](#)," notes Andis.

"In the absence of large-scale, manipulative experiments in controlled settings, the field of road ecology must utilize rigorous observational, control-impact design. With every new wildlife-friendly road

construction project, new potential data points enter the field. We suggest that subsequent crossing [structure](#) assessments use a sampling methodology similar to the one in our study, so that the new data points can be used as replicates in statistical analysis of the variables that impact wildlife crossing structures," he concludes.

More information: A. Z. Andis et al, Performance of Arch-Style Road Crossing Structures from Relative Movement Rates of Large Mammals, *Frontiers in Ecology and Evolution* (2017). [DOI: 10.3389/fevo.2017.00122](https://doi.org/10.3389/fevo.2017.00122)

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