Enhancing Evaluation of Wildlife Detection Systems

Monitoring wildlife and wildlife-vehicle collisions at wildlife crossings

Every year in the United States, wildlife-vehicle collisions (WVCs) cause 200 human fatalities, 26,000 human injuries, and substantial harm to wildlife populations, resulting in approximately $8.4 billion in total costs. The research team examined two US 64 bridges located near Lumberton, New Mexico that were designed to allow wildlife to cross underneath. Monitoring stations were positioned at each of the crossings so that both wildlife approaches and passages were observed. Special mounting brackets were designed and fabricated to allow for the installation of monitoring equipment. Wildlife observations were supplemented with WVC counts.

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PI: Dr. Nicholas Ferenchak (UNM)

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Background

Every year in the United States, wildlife-vehicle collisions (WVCs) cause 200 human fatalities, 26,000 human injuries, considerable property damage, and substantial harm to wildlife populations, resulting in approximately $8.4 billion in total costs.

We seek to examine the effectiveness of wildlife crossing structures. While such WVC-mitigation strategies are becoming popular, questions still remain. Which crossing structures are most effective and for which species of wildlife? How much game fencing is needed to effectively direct wildlife to a crossing structure? What is the best way of monitoring wildlife to explore the above questions?

Project Summary

To answer the above research questions, the research team examined two wildlife crossing structures along US 64 located near the town of Lumberton, New Mexico in the mountainous northern part of the state. Both crossings are US 64 highway bridges over Amargo Creek, with the wildlife crossing under the highway and along the creek. One bridge is relatively small at 110 feet in length while the other is larger at 310 feet in length. A three-mile stretch of highway had wildlife fencing installed in 2012 that was designed to funnel wildlife to the two monitored crossings. Special mounting brackets were designed and fabricated to allow for the installation of monitoring equipment (Figure 1). Past road ecology research by the New Mexico Department of Transportation (NMDOT), Arizona Game and Fish Department (AZGFD), and New Mexico Department of Game and Fish (NMDGF) informed the design of our monitoring sites.

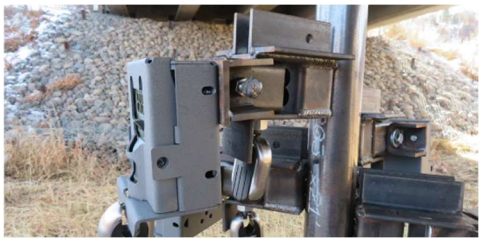

Figure 1. Camera mount.

Status Update

Over the seven months of study (mid-November 2019 to mid-June 2020), nearly 100,000 wildlife photos were captured consisting of 1,438 individual animals. Wildlife approaches and crossings were more frequent at the larger bridge. However, both crossings saw passage rates of approximately 80%, showing that the structures are effective in size and design. Detections primarily consisted of elk and deer, along with fewer sightings of bear, bobcat, coyote, foxes, and mountain lions (Figure 2). Elk predominated during December through March while deer predominated during May through June. Elk used the crossings most frequently between approximately 22:00-02:00 and 06:00-08:00. Crossings were predominately southbound in early winter and northbound in late winter and spring.

Figure 2. Bobcat and bear captured at the crossing site.

Impacts

WVCs have decreased significantly since the wildlife crossing system installation in 2012. There have been no elk collisions in the six years proceeding installation (six elk collisions were reported in the eight preceding years). Deer collisions have also decreased from five collisions in the eight preceding years to one collision in the six proceeding years. WVCs that occurred post-installation were near the ends of the wildlife fencing, suggesting that the fencing extent may be a factor that warrants further research.

This project plays an important role in three larger projects: 1) an on-going collaboration between NMDOT and AZGFD exploring WVC mitigation effectiveness, which is currently entering Phase 2; 2) a multi-state pooled fund study organized by several western states exploring WVC mitigation effectiveness; and 3) the New Mexico Wildlife Corridors Act, SB228, focused on WVC mitigation, which was recently passed through the New Mexico legislature. Lessons learned through this project will help advance the efforts mentioned above and develop our understanding of WVCs, contributing to our goal of saving lives (both human and wildlife) and enhancing wildlife conservation efforts.

Tran-SET

Tran-SET is Region 6's University Transportation Center. It is a collaborative partnership between 11 institutions (see below) across 5 states (AR, LA, NM, OK, and TX). Tran-SET is led by Louisiana State University. It was established in late November 2016 "to address the accelerated deterioration of transportation infrastructure through the development, evaluation, and implementation of cutting-edge technologies, novel materials, and innovative construction management processes".

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