

EXECUTIVE SUMMARY

Riginos, C., H. Copeland, C. Smith, H. Sawyer, K. Krasnow, and T. Hart. 2016. Planning-support for mitigation of wildlife-vehicle collisions and highway impacts on migration routes in Wyoming. FHWA-WY-16/10F

Wyoming is home to abundant big game, including long-distance migratory species such as mule deer, elk, and pronghorn. Where these animals' movement patterns intersect with roads, vehicles often hit animals. This poses a threat both to highway safety and to wildlife populations. In addition to causing direct wildlife mortality, wildlife-vehicle collisions also indicate that roads are posing a partial barrier to animal movements.

The Wyoming Department of Transportation continues to work to reduce wildlife-vehicle collisions and increase habitat connectivity in the state. Maximizing the effectiveness of these efforts requires an understanding of why, where, and when collisions occur. Such information helps to inform decisions about which mitigations are most suitable for a particular location. This is important because mitigation measures vary widely in cost and effectiveness

We used carcass and collision records from 2008 to 2013 to identify the areas in Wyoming with the highest rates of wildlife-vehicle collisions (focusing primarily on deer, which make up the majority of wildlife-related collisions). We identified 27 deer-vehicle collision "hotspots" in the state. These hotspots are stretches of road typically 5-20 miles long that have more than six deer-vehicle collisions (DVC) per mile per year. We first analyzed the location of 493 signs across the state intended to warn drivers about crossing wildlife. We identified locations currently lacking signs that should be considered for signage, and areas with signs where the collision rates do not warrant signage.

We then analyzed the ecological and road characteristics that are associated with areas of high DVC rates. Results showed that DVC spatial patterns are consistent across multiple years. High DVC rates are most strongly associated with high traffic volumes, high speed limits, deer migration habitat, deer winter-use areas, irrigated agriculture, and wetlands.

Next, we examined the spatial and temporal patterns of DVC for each hotspot in relation to known deer migration routes and winter-use areas. We used migration and winter-use data from six mule deer herds in Wyoming from which representative individuals have been fitted with GPS collars to track their movements. By comparing the spatial and temporal patterns of DVC with known deer movement routes, we were able to verify that DVC patterns in other parts of the state accurately reflect the seasonal movement patterns of deer. This analysis also highlighted places in known deer migration routes that suffer from high DVC rates and potential threats to habitat connectivity. Finally, from this analysis, we assessed where DVC hotspots are associated with migration times only, winter-use areas only, migration and winter-use, summer-use, or year-long deer presence.

Using these results, we suggest mitigation measures that are most suitable for each of the 27 collision hotspots. These recommendations take into account the seasonal patterns of

deer movements across the road at that location, traffic volume, and the best current knowledge about the effectiveness of a variety of mitigation measures.