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DESCRIPTION AND ANALYSIS OF VEHICLE AND TRAIN COLLISIONS WITH WILDLIFE IN JASPER NATIONAL PARK, ALBERTA CANADA, 1951-1999

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Abstract

Problem Statement

Jasper National Park (JNP) is located on the East slope of the Canadian Rockies in the province of Alberta, Canada. Two national transportation corridors, the Yellowhead Highway and the Canadian National Railway, each pass through the park. These transportation corridors parallel each other and are located in prime wildlife habitat. Traffic volumes on the Yellowhead Highway are 1.2 million vehicles per year and 12,000 trains per year on the railway. Seventy percent of collisions occur on highways. From 1951-1999, 3,791 large animals have been killed in collisions with vehicles and trains in JNP. From 1980 to 1999 average yearly transportation-related mortality is 149 animals per year.

A variety of wildlife is killed in collisions; however, elk and bighorn sheep make up 53 percent of collisions. This report includes an analysis of collisions involving five ungulates (elk, bighorn sheep, mule deer, white-tailed deer and moose) and four carnivores (wolves, coyotes, grizzly and black bears).

Study Objectives

- To determine the type of highway vehicle responsible for most collisions.
- To analyze and describe changes that have occurred in wildlife populations adjacent to transportation corridors based on collision data.
- To analyse and describe temporal and spatial collision trends.
- To compare collision on highways and the CNR.
- To analyse and describe collisions based on species, age class, and wildlife gender.
- To assess the effect of collisions on the elk population adjacent to transportation corridors.
- To assess mitigation that has been used to reduce collisions.
- To make recommendations to reduce collisions.
- To formulate a methodology to address the issue of wildlife mortality on transportation corridors that may be transferable to other locations and National Parks.
- To analyze and describe spatial and temporal collision trends for use in developing mitigation to reduce wildlife collisions.

Results

The majority of vehicles on the Yellowhead Highway are passenger vehicles and transport trucks. Transport trucks make up a disproportional number of collisions versus passenger vehicles. Spatial and temporal collision trends vary depending on the species. Age class and gender collision rates also vary depending on the species and if the collision occurred on highways or the railway. For some species, these trends are both statistically and biologically significant.

Regression analysis showed highway traffic volumes are not the single greatest contributor to collision rates. Collision rates are also influenced by changes in wildlife behaviour. These changes vary depending on the species; however, migration to winter ranges adjacent to transportation corridors has a significant influence on collision rates.

Using collision data as an indicator of population structure adjacent to transportation corridors shows that changes have occurred in the wildlife structure adjacent to transportation corridors. In some cases, these changes are significant.

Although elk are the most frequent species involved in collisions from 1983 to 1998 collisions with elk did not limit growth of the elk population adjacent to transportation corridors.

This report also includes an assessment of reduced speed zones, from 90 kilometres per hour to 70 kilometres per hour, during a 16-year study period. Reduced speed zones reduced the rate of collisions with elk and other species but had a negligible effect on reducing bighorn sheep collisions.

A description of mitigation measures that have been used in Jasper National Park is also provided, including mitigation suggestions.