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## EVALUATION OF A CITIZEN-SCIENCE HIGHWAY WILDLIFE MONITORING PROGRAM

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### **Abstract**

The Crowsnest Pass in southwestern Alberta, Canada has been highlighted as a critical area for wildlife movement. There are plans to upgrade Highway 3, which cuts through the Pass, to four lanes, with resulting increased traffic volume and speed. Currently, highway traffic volume is between 2,500 to 10,500 vehicles/day. Highway 3 may already be acting as a barrier to large carnivore and ungulate movements patterns, and wildlife mortality from animal/vehicle collisions on Highway 3 is approximately 109 large mammal deaths reported annually for a 46km stretch within the Pass. Detailed wildlife movement information in the Pass is limited.

To assist in understanding wildlife movement patterns along the highway to support decision-making for mitigation, a community based monitoring project was developed. The Alberta research institute Miistakis Institute of the Rockies created *Road Watch in the Pass* (RW), which allows local citizens to enter their wildlife observations along Highway 3 through an interactive web-based mapping tool. Over 1220 observations have been collected in over sixteen months, including 11 species of ungulates and carnivores.

This innovative approach to data collection would benefit from an analysis to determine whether the citizen reports are accurately representing visible wildlife activity along Highway 3. There are likely biases in citizen reports, based on unequal sampling effort involving location and frequency of travel. To identify and address these biases, this study compares spatial and temporal wildlife observation data from RW to a systematically gathered dataset using various statistical approaches.

We began systematic data collection in May 2006 and will continue through May 2007 to examine spatial and temporal characteristics of large mammal species movement (bighorn sheep, elk, moose, mule deer, white-tailed deer and carnivore species) along the highway. A 46-km stretch of Highway 3 was driven as a strip transect. When we observed an animal along or crossing the highway, UTM location, species, date, time, and other data were recorded. Each hour within the 24-hour period were sampled equally across a full year, allowing temporal analysis. Similar data from RW reports provided by citizens during the same period were extracted from the RW database. From May 2006 to March 2007, 395 transects were driven totaling over 395 hours of data collection and resulting in 681 wildlife observations. Spatial and temporal comparisons will be made between systematically gathered data and concurrent Road Watch data. Analysis will include examination of spatial association between the two data collection processes, comparison of spatial distribution, comparison of hourly and seasonal temporal distribution, effect of any biases on spatial or temporal distribution or species composition, and other analyses.

The Road Watch program is an important use of citizen involvement in transportation science. After analysis of RW's accuracy in representing visible wildlife activity in the Crowsnest Pass, this study will provide suggestions and stipulations to improve the scientific rigor of this unique citizen-science program.