Using wildlife vehicle collision data, expert opinions and GPS technology to more accurately predict and mitigate vehicular collisions with wildlife in northern British Columbia

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Thousands of vehicular collisions with wildlife occur on British Columbia (BC) roads each year (Sielecki 2004). Despite attempts at mitigating the losses, collisions with particular species continue to rise (*pers comm.* David Dickson, Insurance Corporation of British Columbia (ICBC) - Regional Loss Prevention Manager, North Central Interior) (Figure 1). Lack of effective countermeasure implementation and failure to reduce claims appears to be due, in large part, to a lack of accurate record keeping and data accessibility. What species of animals are being struck by motorists and when and where it is that these collisions are occurring across the province is unclear.

In an effort to more accurately pinpoint when and where collisions with various species of wildlife are occurring on northern BC roads, we are analyzing 10 years of ICBC automobile claims data, Wildlife Accident Reporting System (WARS; provided by Ministry of Transportation) data and information that we have collected from local experts (road maintenance contractors, highway patrol, conservation officer service, etc) on where collisions are perceived to be recurrent. In addition to these methods, we have partnered with three local trucking companies (Excel Transportation Inc., Lomak Bulk Carriers Corp. and Grandview Transport Ltd.) based in Prince George, BC to record data on roadside animal occurrences in an innovative way.

With the help of a company based in Winnipeg, we have modified a road safety device that utilizes Global Positioning System (GPS) technology to capture date, time, and location using specifically designed waypoint buttons for deer (*Odocoileus* spp.) and Moose (*Alces alces*), which are the most commonly observed large animals on roads in northern BC. Ten units are currently deployed in trucks that ferry goods back and forth along designated routes in northern BC several times a day. When a truck driver observes a Moose or deer in the road corridor, he or she depresses the appropriate button to record a waypoint of that animal. If the deer or Moose observed is dead, the trucker depresses a "dead" button on the unit quickly after selecting the Moose or deer button. Location, date, and time of day as well as species and whether or not the animal is dead are recorded in the unit's memory. Twice per month, data are downloaded by company dispatchers and e-mailed to our research team at the University of Northern BC where it is uploaded into GIS mapping

Figure 1. Collisions with Moose continue to be a serious threat to the motoring public in many parts of northern BC. Highway 16 east of Vanderhoof, BC. June 2003 (Roy Rea).

software and mapped (Figure 2).

GPS technology is widely used for wildlife and habitat monitoring (Hulbert and French 2001) and is used by wildlife managers and hunters as a tool to spatially monitor hunting behaviour and success (Stedman et al. 2004). GPS is also recently beginning to be used for recording wildlife vehicle collision locations (Huijser et al. 2005). Although professional drivers have been employed to collect long-term wildlife sightings in places such as national parks (Burson et al. 2000), having drivers do so with the type of technology we are experimenting with remains unpublicized.

Although the project is still in its infancy (our GPS

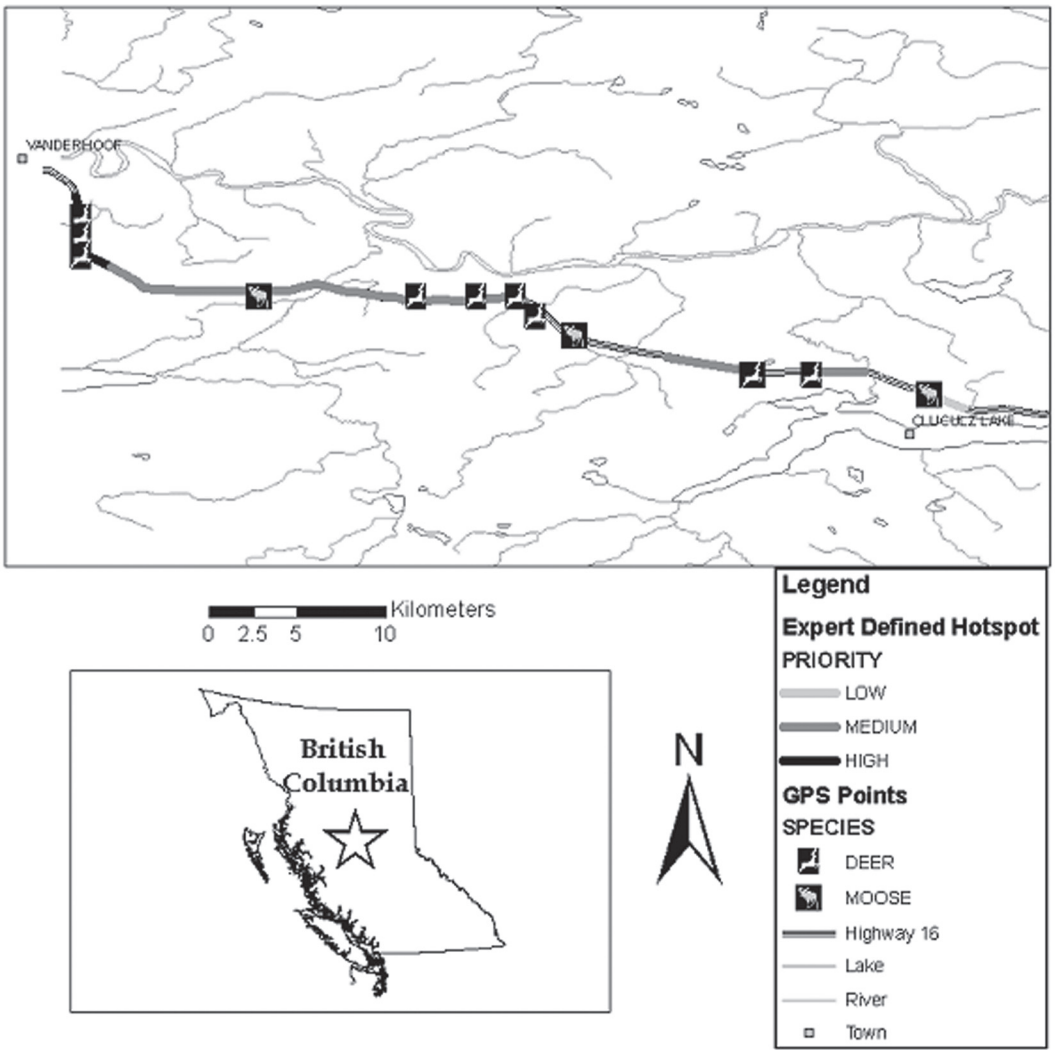

Figure 2. Map showing GPS-recorded locations for Moose and deer (over a one week period in July 2006) and sections of Highway 16 determined by experts to be "hotspots" for collisions with wildlife. Note: Final versions of the maps will also include input from WARS database.

units were deployed in July), our results are exciting and promise to help us build a robust database, where information can be recorded on when and where various species are observed along roadsides and/or are being struck by vehicles. Additionally, the GPS device has the potential to be further modified and used to record roadside occurrences of several different species. Furthermore, the system has the potential for uploading data via wireless networks or satellite linkages for peer to peer real-time usage.

For now, our combined data sets will soon be used to help us more precisely predict when and where animals are most likely to occur along highways. Site investigations of these roadside areas will be conducted and the information analysed to help us determine why animals are found associated with particular areas. A better understanding of the roadside ecology of wildlife species will then allow us to recommend countermeasures that are site- and species-specific and do so in a way that, in northern BC, has yet to be done.

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About the Authors

Roy (Figure 3) teaches Animal Physiology, Field Applications in Resource Management and Plant Systems labs at UNBC and has been studying the ecology of ungulate collisions for the past six years.

Figure 3. Authors Roy Rea (right) and Dexter Hodder discuss with a Conservation Officers in Terra Nova National Park, NF, the circumstances surrounding an automobile-Moose calf collision. June 2004 (Bill Clarke).

Eric is a professor in the School of Environmental Planning at UNBC researching interactions between infrastructure planning and environment, and teaches environmental impact assessment, integrated resource management, and ecological design.

Dexter (Figure 3) is the Research Coordinator for the John Prince Research Forest based in Fort St. James, BC. He works on a variety of wildlife and habitat monitoring projects including species such as Moose, deer, bears and River Otters.

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Nicole is a fourth-year biology & chemistry joint major undergraduate student at UNBC, and is a research assistant working on strategies to reduce vehicle collisions with wildlife in northern BC. She has a passion for animals and thoroughly enjoys working with and for them.