



Time for Nature



Studying Animal-Friendly Highway Crossings Banff National Park of Canada

The Trans-Canada Highway runs right through Banff National Park of Canada. While this has helped motorists zip across the country and has made Banff accessible to millions of visitors, the highway has its downside. It has created a barrier that makes it difficult for wildlife to move from one side of the road to the other.



The Trans Canada Highway runs right through Banff National Park of Canada. Over the years, traffic on the highway has increased. So have vehicle-wildlife collisions. © Parks Canada, Lynch, W., 1991.

Creating safe crossings

Over the years, traffic on the highway has increased. So have vehicle-wildlife collisions. To reduce the number of accidents, Parks Canada has upgraded portions of the highway. This includes dividing and twinning the lanes and installing fencing and wildlife overpasses and underpasses. These crossings allow animals to pass safely over or under the highway.

The system has reduced collisions with wildlife by more than 80%. By monitoring the wildlife crossings, Parks Canada has learned that 10 species of large mammals have used them more than 60,000 times since 1996. However, the number and genetic makeup of individual animals using the crossings are unknown.



Healthy ecosystems have healthy wildlife populations, so it is critical to know how Banff's crossings are benefiting populations, not just individuals. This requires measuring the flow of genes across the highway.

To reduce the number of accidents, Parks Canada has upgraded portions of the highway. This includes dividing and twinning the lanes, fencing the right of way and installing wildlife overpasses and underpasses. The crossings allow the animals to pass safely over or under the highway. © Jenny Klafki, 2002.

Maintaining healthy wildlife populations

Measuring gene flow to determine whether crossings help maintain healthy populations has never been done before. But this knowledge could significantly alter how roads are built in wildlife habitat. Consequently, scientists need to determine whether the crossings allow the movement of adult male and female animals across roads. Scientists also want to see how roads affect reproduction, survival and dispersal



of young animals. Traditionally, this would require decades of radio-tracking animal movements.

Barbed wire and DNA analysis provides answers

Parks Canada can't wait decades for answers, so scientists launched a two-year pilot study that combines modern DNA analysis with a surprisingly simple tool: barbed wire. Researchers install a strand of barbed wire at crossing sites, and the wire snags a bit of hair from passing animals. From the hair, researchers take a DNA "fingerprint". Because the DNA of every animal is unique, scientists can identify each individual and determine its sex and ancestry.



Researchers install a strand of barbed wire at crossing sites, which snags a bit of hair from passing animals. From the hair, researchers take a DNA "fingerprint".
© Chad Townsend, 2005.

To fund the study, Parks Canada joined with Montana State University, the Henry P. Kendall Foundation, the Wilburforce Foundation and the Woodcock Foundation.

Promising research

Wildlife biologist Dr. Tony Clevenger is in charge of the study. It is "going extremely well," he says. "Nearly 100 percent of the time the animals used the crossings, they passed through the wire and left hair."

"This technique provides us with genetic data from individuals using the crossings, and tells us who is contributing to gene flow and interchange between populations separated by the highway."

The pilot study is yielding excellent information on ecological connectivity. Comparing DNA/hair-sampling data from crossings to data from the entire population could provide an even better picture of the conservation benefits of wildlife crossings.

For more information visit www.pc.gc.ca/banff