

# **A Report to the Woodcock Foundation**

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## **Integrating Science and Education in Restoring Ecological Connectivity Across Transportation Corridors in Mountain Landscapes**

Research, Media, Outreach and Technical Transfer  
*December 2005 thru November 2006*

### **I. NARRATIVE**

The research findings and overall effectiveness of the Banff Wildlife Crossings Project are being broadly disseminated throughout North America. The Western Transportation Institute has targeted three areas to share the successes of the project with key constituencies. The popular media – newspapers, radio, and television - is widely broadcasting to the general public the importance of landscape connectivity and the function of Banff’s wildlife crossing structures as a tool to provide wildlife a safe passage around busy highways. We are providing a wide variety of outreach materials and opportunities for youth, tourists, and others interested in the welfare of wildlife via a poster, museum displays, and field trips to the overpasses and underpasses. Finally, for transportation professionals to understand design and other technical requirements, as well as the statistically valid effectiveness of the Banff wildlife crossings, we conduct workshops, publish in professional venues, and provide site visits.

Overall, the Banff Wildlife Crossings project is the best known highway-wildlife mitigation effort in North America. Most scientific studies last one to three years; critical to Banff is the fact that its studies have been ongoing for a decade. These result in strong statistical analyses, the ability to discern trends, and findings not found at any other of transportation-wildlife mitigation site in Canada or the United States. Therefore, Banff’s scientific monitoring and related studies are being incorporated into highway designs across the continent. To assure there is a high level of awareness of these facts and findings, the Project actively seeks media, outreach, and technical transfer opportunities.

#### **Research**

##### ***Genetic connectivity and highways***

New research on genetic connectivity of grizzly bears across the Trans-Canada Highway began in May 2006. This is a 3-year PhD project between WTI and the Ecology Department at Montana State University, and is being conducted by Mike Sawaya (PhD candidate) and 5 field assistants.

*Bear population DNA:* Fieldwork was conducted from May 15-October 20, 2006. Fieldwork consisted of the collection of bear hair using 2 methodologies: hair snares and rub tree surveys. One graduate student, 2 field technicians and 3 volunteers were primarily responsible for conducting fieldwork. Hair snaring occurred from May 24-August 15. A 7x7 km grid was used to distribute effort across the study area. One hair snare was placed in each grid cell for

each of 5, 14-day sampling sessions. Each site was checked for hair after 13-15 days and then removed and relocated to another area within the cell. A total of 188 hair snare sites were established and monitored. Bear hair was collected from 90/188 (48%) of these sites and 841 hair samples were collected. Over 326 rub trees were identified in the study area. The location of each tree was recorded using GPS and wire was affixed to over 300 of these trees. Each trail segment will be surveyed twice by October 20. Over 300 samples have been collected from rub trees.

*Wildlife crossing DNA:* Previous Woodcock Foundation grants allowed the development of a technique for sampling and genotyping hairs “captured” from passing bears at wildlife crossings. As part of the research on grizzly bear genetic connectivity, hair was collected from bears at 22 of 24 Banff wildlife crossings between May and October 2006. To date, 97 hair samples have been collected from bears (52 black bear, 45 grizzly bear). The hair capture rate was 45% and 57% for black and grizzly bears, respectively. Bears avoided the hair-capture system less than 10% of the time they visited the crossings.

*DNA analysis:* All hair samples collected this year from the grid cells, rub-trees and wildlife crossings will be sent to the Wildlife Genetics International lab in Nelson, B.C. for genetic analysis. Results from samples will be available in spring 2007.

Comparing DNA/hair-sampling data from animals using the crossings structures with DNA data from a broader segment of the population will provide a scientifically rigorous assessment of the conservation benefits of wildlife crossings. The results will provide a measure gene flow and connectivity of grizzly and black bears using wildlife crossings and also will feed empirical field data into theoretical models (see NSERC visiting fellowship below) and refine estimates of connectivity needed to sustain bear populations.

*Wildlife crossings:* Monitoring of the 24 wildlife crossings continues. Wildlife crossings were checked on a daily basis while sampling DNA/hair (May-October).

*Postdoctoral research* will begin in October 2006, as candidate Dr Guillaume Chapron from France is expected to arrive in Banff with a National Sciences and Engineering Research Council (NSERC, Canada’s “National Science Foundation”) visiting fellowship. Guillaume will develop grizzly bear population models that explicitly address whether Banff’s wildlife crossings are providing population level benefits and long-term viability.

### **Media**

Reporters for the New York Times, National Public Radio, the Canadian Broadcasting Corporation (CBC) and other media outlets were given a field trip to the Banff Wildlife Crossings Project as part of a science and communications project developed by the Woodcock Foundation.

The New York Times science editor, Cornelia Dean, did a major story on the Yellowstone to Yukon bioregion, *Home on the Range: A Corridor for Wildlife*, with a special focus on the Banff Wildlife Crossings on the Trans-Canada Highway. Quotes and photos were provided by Tony Clevenger. The story was picked up by the Montreal Gazette, Toronto Star and many other newspapers across North America.

The CBC Radio1 broadcasted a ½ hour segment on the nationwide program “The Current” about the Yellowstone-to-Yukon Conservation Initiative with special attention paid to the Banff Wildlife Crossings Project.

A local newspaper, The Rocky Mountain Outlook, did a story on the newly constructed Deadman Flats’ wildlife underpass and its effectiveness, with quotes from Tony Clevenger.

Ronald Tobias, the director of Montana State University’s graduate film program, Natural History and Science, committed to making 5 podcasts on road ecology issues targeted for children 10-15 years old. Filmmakers shot footage in Banff in October and the first podcast is slated for completion in January 2007.

### **Outreach**

The Whyte Museum of the Canadian Rockies in Banff, Alberta, hosted an exhibit of the Banff Wildlife Crossings Project that includes videos, maps, photos and user-interactive games. The exhibit was in the museum throughout the tourist season. Over 19,000 visitors attended the exhibit and many signed into the register at the exhibit. The Whyte exhibit has been nominated for a “Banff Tourism Heritage Award” for “*Most Innovative Commitment to National Park and World Heritage Site Awareness*”.

Directors of Calgary’s Glenbow Museum visited the Whyte Museum exhibit in September 2006 before its close. The Glenbow Museum will include the Whyte Museum “Wildlife Crossings” in a new exhibit slated for opening in 2008.

Parks Canada created a poster of wildlife crossings and the species that use them along the Trans-Canada Highway (TCH) in Banff National Park. These will be used for educational outreach in K-12 to educate students, as well as the general public, on the findings of Tony Clevenger’s 10 years of research on the Banff’s 24 wildlife crossings.

The American Museum of Natural History in New York City opened a special display on the Yellowstone to Yukon Conservation Initiative it includes some of Tony Clevenger’s photos of the Banff Wildlife Crossings Project.

The Montana State University’s Renne Library hosted an author’s reception of MSU faculty. Tony Clevenger submitted a book he co-authored “Assessing and Managing the Ecological Impacts of Paved Roads” published for the National Research Council by the National Academies Press.

An article on Tony Clevenger’s research on wildlife crossings of the Trans-Canada Highway in Banff National Park was selected by the international conservation group The Wildlands Project for its spring 2006 newsletter and the Yellowstone-to-Yukon Conservation Initiative winter 2006 newsletter.

The Yellowstone-to-Yukon Conservation Initiative’s Board of Directors and staff were given a tour to several of the wildlife crossings, an overview of the findings of the project, and finished with a visit to the Whyte Museum’s display.

A group of students and instructors from The Banff Centre's 2-week course on "Communicating Science" were taken to a wildlife underpass and visited the Whyte Museum's display. The course provides professional development for scientists, journalists, public and private sector communications professionals, and educators responsible for communicating about science.

A 4-page colour brochure titled "The Banff Wildlife Crossings Project – Lessons from highway wildlife crossings in a North American protected area" was produced as a handout when meeting potential funders, visitors to the Banff project and attending professional meetings.

### **Technical Transfer**

The front and back covers of the textbook, *Essentials of Conservation Biology* (4<sup>th</sup> edition), by Richard B. Primack focused on the Banff Wildlife Crossings project. It is published by Sinauer Associates, Inc. and is the most widely used textbook for Conservation Biology courses at universities in North America.

Tony Clevenger led a group of 18 students and 4 course instructors to the Vermilion wildlife underpass (Trans-Canada Highway) and discussed the long-term research on the Banff Wildlife Crossings. The group was part of an intensive, 2-week course at the Banff Centre on "Science Communications". The course provides professional development for scientists, journalists, public and private sector communications professionals, and educators responsible for communicating about science.

A 2-day workshop for Canadian transportation engineers on the principles and techniques for mitigating highways for wildlife and fisheries was held on 12-13 October 2006 at the Banff Centre. A total of 23 transportation engineers primarily from Canada took part. It included a field trip to several Banff wildlife crossings and current Trans-Canada Highway expansion (phase 3B) near Lake Louise.

The editorial board of *TR News*, the full color magazine of the Transportation Research Board of the National Academies of Science accepted an 8-page article for publication, including photos, of the Banff Wildlife Crossings Project. It is schedule for distribution in Spring 2007.

### **Challenges**

A significant effort has been made in the last 6 months to attract Canadian funders to the partnership. A dozen letters of inquiry have been sent to Canadian foundations, both corporate and private, with program areas aligned with the Project. Most letters have not been answered although 4 have been rejected. The recent "Picture-a-Province" initiative bringing together foundations and ENGOs active in Alberta, such as WTI, should help better focus efforts to attract Canadian-based (primarily Calgary) partners to the Project.



Adult female grizzly bear with her three cubs on the Redearth Wildlife Overpass, 6:06am on July 21, 2006, Banff National Park, Alberta.

**II. FINANCIAL**  
*(through November 2006)*

	<b>Budget</b>	<b>Spent</b>
Salaries	23,165.00	21,706.23
Benefits	6,718.00	6387.01
Travel	2,500.00	3,144.63
Supplies	950.00	227.46
Printing*	0.00	1868.00
Total direct costs	33,333.00	33,333.33
<i>Indirect costs (overhead)</i>	<i>1,667.00</i>	<i>1,666.67</i>
<b>TOTAL</b>	<b>35,000.00</b>	<b>35,000.00</b>

\* The Banff Wildlife Crossings Project brochure (see "Outreach" above)