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MEASURING GENE FLOW ACROSS THE TRANS-CANADA HIGHWAY AND POPULATION-LEVEL BENEFITS OF ROAD CROSSING STRUCTURES FOR GRIZZLY AND BLACK BEARS IN BANFF NATIONAL PARK, ALBERTA

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Abstract

The section of the Trans-Canada Highway (TCH) that bisects Banff National Park, Alberta supports the highest volume of traffic of any road in the North American national park system and is recognized as an important stressor to the ecological integrity of the central Canadian Rockies. Wide-ranging carnivores, such as grizzly (*Ursus arctos*) and black bears (*U. americanus*), are particularly vulnerable to road mortality and habitat fragmentation caused by roads. In order to mitigate these negative impacts on wildlife, twenty-four crossing structures have been constructed across the TCH. Over a decade of intensive study of these wildlife crossings has shown they reduce mortality and maintain wildlife movements. Track pads have recorded both bear species crossing the TCH on 1389 occasions, but the number of different individuals using the crossings, their genders and the demographic and genetic benefits of the crossings for populations remain unknown.

In 2004 and 2005, a pilot study was conducted at two of the crossing structures to evaluate the feasibility of using a barbed wire hair sampling system to determine the number of individual male and female grizzly and black bears passing through the crossings. Based on the results of that pilot study, a three-year research project was initiated in 2006 to evaluate the conservation benefits of wildlife crossing structures for grizzly and black bear populations in the Bow Valley of Banff National Park. The hair sampling system was installed at 22 of 24 of the crossing structures to determine the total number of male and female bears using the crossings and the populations of grizzly and black bears in the Bow Valley surrounding the TCH were also sampled using a combination of hair snares and rub tree surveys. The genetic information derived from the hair samples will be used to: assess the effectiveness of different types of crossing structures, estimate the population sizes for both bear species in the Bow Valley, calculate the proportion of the population using the crossings and quantify the level of movement and gene flow across the TCH.

This poster highlights our research objectives and presents some of the preliminary results from the 2006 field season. 12 grizzly bears (7 males, 5 females) and 11 black bears (7 males, 4 females) were identified from the samples collected at the crossing structures and 40 black bears (16 males, 24 females) and sixty-three grizzlies (37 males, 26 females) were identified from the samples collected from the hair snares and rub trees. These data will be analyzed using a combination of population viability analysis and landscape genetics approaches to assess the demographic and genetic benefits of wildlife crossings for bear populations in the Bow Valley. Wildlife crossings are gaining recognition as an effective method for reducing road-caused mortality and maintaining wildlife movement, but the conservation benefits of crossings for bears at the population-level has yet to be evaluated.