

Black bear abundance, human conflict, and interaction with grizzlies in southwestern Alberta

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Credit: Ted Loosen

Project Summary

Rarely do research and monitoring projects target more than one large carnivore species. We've partnered with a grizzly bear monitoring project to do just that. Using an existing, unutilized data set, our collaborative project will evaluate human-black bear conflicts, black bear density, abundance, and distribution, and habitat use by black and grizzly bears.

Southwestern Alberta, Canada, is a multi-use landscape of ranching, farming, oil and gas development, and recreational use. It is also home to a full suite of large carnivores. Since the provincial grizzly bear hunting moratorium in 2006, grizzly bears have been recolonizing portions of their former range. Today, where landowners and guide-outfitters have historically seen black bears, they report seeing primarily grizzly bears. Black bear conflicts are also increasing; in one Fish and Wildlife district, human-black bear conflicts nearly tripled from the previous year.

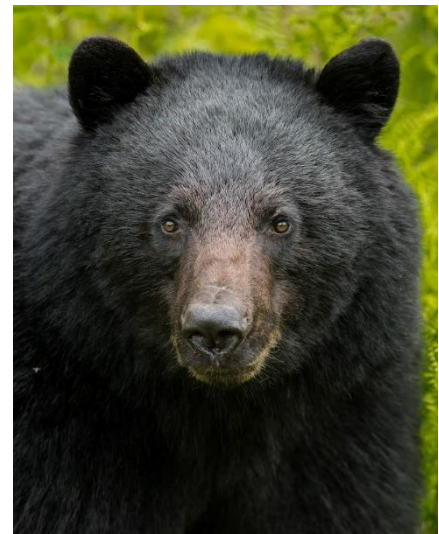


Figure 1. The American black bear. Credit: Mark Boyce

Despite these observations, black bears in Alberta remain poorly studied. Black bear population studies are a research priority stated in the current and draft provincial Black Bear Management Plan. As a result, we have partnered with provincial and federal wildlife agencies, as well as local community-conservation groups, to design and implement this project.

Project Background

The International Union for Conservation of Nature estimates that black bear harvests in the U.S. and Canada total 40,000–50,000 annually¹. Despite the popularity of black bear hunting, reporting of harvest success is not required in many portions of their range, including Alberta. Aside from indirect harvest and conflict records, no current empirical data exists for black bear population sizes and provincial estimates are over 20 years old. In southwestern Alberta, spring and fall hunter harvest tags are issued for public and private lands and landowners can harvest black bears year-round without a tag. Neither harvest method requires reporting to wildlife or enforcement agencies. Voluntary post-season annual hunter surveys indicate a minimum of 30% of the population was removed in southwestern Alberta in 2013. However, this estimate is conservative at best as it does not include harvest on private land, which is assumed to be high. These numbers are well above the province’s human-caused mortality rate objective of 20%.

In addition, southwestern Alberta often reports some of the highest rates of human-large carnivore conflicts in the province. Conflicts with bears, in particular, come with financial costs, an increased safety risk for humans, and threaten large carnivore populations because animals involved in conflict may be relocated or killed. In particular, human-black bear conflicts are increasing; 2014 marked a nearly four-fold increase in human-black bear incidents, defined as events that resulted in property damage or food-rewards, from the previous year.



Figure 2. The study area is bounded by Highway 3 to the north, British Columbia to the west, Montana to the south, and the edge of grizzly bear range to the east. This area is managed provincially as Bear Management Area 6.

Black bears also face a changing landscape in southwestern Alberta, including an increasing grizzly bear presence. Southwestern Alberta is home to the highest grizzly bear densities in Alberta. Today, places where local residents have historically seen black bears, they report seeing primarily grizzly bears. Previous research suggests that grizzly bears can alter black bear feeding behaviour, activity patterns, and home range sizes.

¹ <http://www.iucnredlist.org/details/41687/0>

Here, we propose using non-invasive genetic sampling methods to evaluate black bear populations, understand spatial variation in human-black bear conflicts, and investigate black and grizzly bear interactions on a shared landscape.

Methods

In collaboration with a Grizzly Bear Monitoring Project², 899 rub trees, power poles, fence posts, and fence lines were set up to collect hair samples in 2013 and 2014. This study area is on public and private land and is bounded by Highway 3 to the north, British Columbia to the west, Montana to the south, and the edge of grizzly bear range to the east (known provincially as Bear Management Area 6). Rub objects were visited eight times from May-November, sampling every three weeks in 2013 and 2014. In addition to systematic sampling, landowners volunteered to collect opportunistic hair samples to supplement the data.

Because Alberta has a variety of colour-phase black bears, it is difficult to distinguish between grizzly and black bear hair in the field. A genetic prescreen has indicated that roughly 40% of hairs sampled during the Grizzly Bear Monitoring Project are from black bears. Genetic work was completed by Wildlife Genetics International (Nelson, B.C.) to determine individual black bears based on the analysis of nuclear DNA extracted from hair follicles.

Genetic analyses of black bear hair samples to identify sex and individuals has been completed by Wildlife Genetics International (Nelson, BC). In 2013, 232 individual black bears were detected [129 males, 103 females]. In 2014, 222 individuals were detected [122 males, 100 females]. In total, 347 unique black bears were detected in the study area at some point in 2013 and 2014. Of these bears, 107 individuals were detected in both years.



Figure 3. A black bear uses one of the study's rub trees (left). After collecting hair samples, Anne Loosen "cleans" the barbed wire of old hair samples for the next sampling session (right). Credit: Spencer Rettler, Christine Misseghers.

² <http://esrd.alberta.ca/fish-wildlife/wildlife-management/grizzly-bear-research/southwest-alberta-grizzly-monitoring.aspx>

Implications

Black bear hunting is popular in Alberta, and we know that current harvest rates in southwestern Alberta are above the province's objective harvest rate; however, this is based on a 20-year-old population estimate. Meanwhile, black bear conflicts have been increasing. For species like black bears that face an increase in a more dominant species like the grizzly bear, the future may hold unanticipated changes in spatial and temporal use of the landscape. Having current population data will provide insight into the number of unique individuals and the sex ratio in southwestern Alberta. Ultimately, these data will provide a better understanding of population abundance and distribution and will help create sustainable and appropriate harvest objectives based on current rather than outdated information, thus allowing for continued recreational opportunities.

This work is being completed as part of Anne Loosen's M.Sc. degree at the University of Alberta. Final results are expected in 2017 and will provide meaningful information for wildlife biologists tasked with managing provincial black bear populations.

For more information and a complete list of sponsors, please visit our website at: <http://www.biology.ualberta.ca/blackbear/>



Figure 4. Black bears in a river bottom in southwestern Alberta. Credit: Jen Jenkins