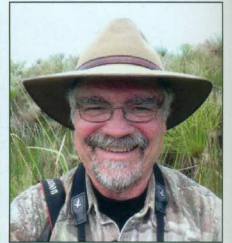


Grizzly bear livestock conflicts are not alleviated by intercept feeding

"A helicopter slings road-killed ungulates to a remote location as part of the southwestern Alberta spring intercept feeding program."



Andrea Morehouse



Mark S. Boyce

Beginning in 1998, Alberta Fish and Wildlife staff collected road-killed ungulate carcasses each fall and stored these until mid-March when they were slung by helicopter to remote high-elevation areas in an attempt to “intercept” grizzly bears when they emerged from their dens. The goal of Alberta’s intercept-feeding program has been to reduce spring predation of livestock by grizzly bears. The hope was that grizzly bears would feed at these carcass piles rather than continuing to lower elevation areas where vegetation was greening up and where cattle were calving.

This intercept-feeding program was a joint effort between Environment and Parks and Parks Canada (with in-kind contributions from other groups) and took place in southwestern Alberta in an area known as Bear Management Area 6 (BMA6). BMA6 is bounded by Highway 3 to the north, British Columbia to the west, Montana to the south, and the extent of grizzly bear range to the east. Although intercept feeding continued for 15 years, no one had assessed whether the program actually reduced livestock depredations; our purpose was to evaluate the efficacy of this program.

We began by evaluating the number of grizzly bears that used these intercept-feeding locations. In 2012 and 2013, we monitored 12 intercept-feeding sites. The sites were chosen by the Alberta government and had to meet the following conditions: more than 400 metres from 2 wheel-drive roads, more than 5 kilometres from residences, and relatively high elevation.

At each site, we used fencing staples to attach pieces of barbed wire to two trees that were in close proximity to the carcass drop site. Prior to the first drop, we sprayed selected trees with WD40 to elicit a rub response (bears like petroleum-based products). Hair accumulated on the barbed-wire pieces until the second drop when hairs were collected and the tree was sprayed again.

Hair samples were used to identify species, individual identity, and sex via analysis of nuclear DNA extracted from hair follicles. Additionally, at each site we deployed up to three remote trail cameras. Trail cameras were pointed at each artificial rub tree, as well as the carcass drop site. We reviewed images from the trail cameras to identify grizzly bear presence at each feeding site, as well as family groups (i.e., sows with cubs).

Using DNA extracted from collected hair samples, we detected 18 individual grizzly bears using the intercept-feeding sites in 2012 (15 males, 3 females). In 2013, we detected 11 males using the sites but no females. In total, 22 individual grizzly bears were detected at the intercept-feeding sites over the two years of sampling (19 males, 3 females). Remote trail cameras detected females with cubs at three intercept-feeding sites.

We compared the number of bears detected at the intercept feeding sites to those detected throughout the study area. Study-area detections were obtained from



"Annie Loosen sets up a remote trail camera to capture images of grizzly bears using the intercept feeding sites."

our concurrent grizzly bear monitoring program that used natural rub objects to collect hair samples. The number of bears detected in our larger monitoring program represented the number of bears that had used the study area at some point during the sampling period of May through mid-November (our larger monitoring program was described in the April 2014 *Alberta Outdoorsmen*, and additional details are on our project website). Within BMA6, we detected 117 grizzly bears in 2012 (70 males, 47 females), and 118 grizzly bears in 2013 (66 males, 52 females). Cumulatively, 165 individual grizzly bears have been detected at some point over the two years of sampling (May through November) in BMA6 (92 males, 73 females). Thus, relative to the number of bears found in BMA6, only a small number used the intercept feeding sites.

Intercept-feeding sites were used primarily by males. Because mature male



"This trail camera photo shows a grizzly bear and wolves fighting over a carcass at one of the intercept feeding sites. Although the sites are placed to target bears, other carnivores visit the locations as well."

bears are dominant, these males might have excluded more subordinate bears (e.g., young bears, sows) from using the feeding sites. Additionally, females with cubs might have been avoiding the intercept-feeding sites because of the risk that males would kill their young. Even though intercept feeding benefited almost exclusively male bears, the feeding involves provisioning of high-quality food for the bears at a crucial stage in their annual cycle, thus probably increasing survival and contributing to the population growth rate for the bears of more than 4%.

As another means for monitoring the

effectiveness of the intercept-feeding program, we tracked grizzly bear complaint records. When an individual registers a complaint about a grizzly bear, the record is recorded in an electronic database maintained by the Province. We read 16 years of grizzly bear complaint records from 1999 (the creation of the electronic database) through 2014, and recorded each occurrence as a sighting, incident, or human conflict. We reviewed and classified 1,140 occurrence records for grizzly bears in BMA6 from 1999 through 2014 (499 incidents, 587 sightings, and 52 human conflicts). We considered not only total



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"Andrea Morehouse applying WD40 to a prospective rub tree."



"A remote trail camera captures a photo of a grizzly bear rubbing on a WD40 rub tree. The barbed wire attached to the tree snags the bear's hair, which will be later used for DNA analysis."

occurrences, but also specifically grizzly bear complaints from March through June 15. We focused analysis on grizzly bear incidents because those represent interactions between grizzly bears and human activities. An incident is defined to be an occurrence in which the grizzly bear caused property damage, obtained anthropogenic food, killed or attempted to kill livestock or pets, or was involved in a vehicle collision.

Because the spring intercept-feeding program was designed to reduce grizzly bear predation on livestock, we tracked livestock incidents for both spring and non-spring. Further, we evaluated historical grizzly bear records from 1982-1995, prior to the implementation of the intercept program. No text was provided in the 1982 to 1995 records, but location, date, and a general descriptive category were included. We considered records labeled as "personal/property damage – livestock harassment/kill/mauling", as similar to our category "livestock incident." We compared the average number of livestock incidents prior to and during intercept feeding.

Had the intercept-feeding program been effective at decreasing conflicts, we expected that spring livestock depredation would decrease after implementation.

However, we did not find that to be the case. In the historical dataset from 1982 through 1995, the frequency of spring grizzly bear livestock incidents was variable ranging from zero to three incidents per year. Non-spring and spring grizzly bear incidents actually increased after 1999, as have livestock-specific incidents. Incidents have continued to increase at a rate that far exceeds the estimated increase in the grizzly bear population. Grizzly bear livestock incidents were on average lower before intercept feeding began (1982 – 1995: 0.8 /year) than during intercept feeding (1999 – 2013, 3.3 /year).

In 2014, the provincial government temporarily suspended the intercept feeding program, yet there were fewer grizzly bear incidents in spring 2014 than in the spring of 2013 despite the absence of the program.

In addition to monitoring rub objects, we specifically targeted grizzly bear agricultural conflict sites to collect hair samples. We found that grizzly bears detected at spring conflict sites were different bears that were using intercept feeding sites. Of the 22 bears detected at intercept feeding sites, only two also were



"Two grizzly bears feed on road-killed ungulates at one of the spring intercept feeding sites."

detected at a spring conflict site (2012).

Finally, we estimated program costs based on 2012/2013 operational costs. We conservatively estimated annual operating costs to be \$43,850 CAD, and initial capital equipment costs were \$19,000 CAD. Thus, approximately \$720,600 has been spent on the intercept feeding program since its inception in 1998. Our results suggest that the spring intercept feeding program has not been reducing livestock depredation. Continued support of programs such as electric fencing and deadstock removal might be a more effective solution than intercept feeding to spring livestock depredation by grizzly bears. ■

Footnote: Project support from ACA, Alberta Ecotrust, Alberta Innovates – Bio Solutions, Alberta Sport Recreation Parks and Wildlife Foundation, Disney, Drywood Yarrow Conservation Partnership, Environment Canada Science Horizons, International Association for Bear Research and Management, Minister's Special License, Miistakis Institute, Nature Conservancy, NSERC, Parks Canada, SCI, Shell, TD Friends of the Environment, Waterton Biosphere Reserve, and Y2Y.

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