

Grizzly Bear Habitat Use

Collaborative Study with fRI Research



2016 Progress Report

By Mark Bradley

This report should be cited as:

Bradley, M. 2017. Grizzly Bear Habitat Use Collaborative Study with fRI Research – 2016 Progress Report. Unpublished. Technical Report. Parks Canada Agency, Jasper, Alberta. 6 pages.

Abstract

Jasper National Park is collaborating with fRI Research to study grizzly bear habitat use. Our goal is to maintain 10 satellite GPS collars on grizzly bears from the spring of 2015 to the end of 2018 (3 capture years, 4 data gathering years). We are entering the third and final capture season, with no capture related bear mortalities or major injuries so far. Data analysis, report writing, and paper submission will begin after the 2018 data collection is final.

Introduction

Jasper National Park (JNP) has a long standing collaboration with fRI Research (fRI), a research organization that operates on the provincial industrial land-base east of JNP, and whose goal is to study how land use practices impact wildlife. One of the major projects within the fRI is the grizzly bear project. JNP has benefitted from a number of fRI's grizzly bear-related studies, including a collaboration on black and grizzly bear population estimates (Stenhouse et al. 2015, Boulanger et al. 2016), and preliminary data on stress hormones (from hair samples). fRI has provided JNP with important Geographic Information System (GIS) products that we use in land use planning (e.g resource selection function maps informed the Maligne Valley planning process). To date, these products were based on bear location data that were mostly collected outside of JNP. Our goal for the current project is to test and refine some of the current GIS products with new JNP and AB bear location data. fRI will use the JNP data as a control to compare against bear habitat use in the industrial landscape. This work is also meant to update and improve upon work done previously in JNP and the foothills on the effects of industrial land use on grizzly bears ((Nielsen et al. 2003)). We can also use the JNP GPS locations to inform park decision making around problem grizzly bears, and to quantify bear selection of human landscape features.

Methods

The goal is to maintain 10 collars on grizzly bears from 2015 through 2018 (Figure 1).

Trapping was mostly by culvert trapping, but some bears were darted and drugged from helicopters. One bear was free range darted under unusual conditions (i.e. no chance of people appearing, or potential for harm to the bear). The immobilization drugs used were a combination of medetomidine and telazol (MZT). Atepamazole was used as an antagonist. Trapping procedures satisfied both national park and Alberta safe handling protocols.

During handling, vital signs were recorded every 10 to 15 minutes. Blood, skin and hair samples were taken. Morphological measurements and body weight were recorded. A premolar tooth was removed (after freezing with a local anaesthetic) for aging by cementum annuli. If vital signs fell outside of recognized thresholds, the antagonist would be given immediately and the bear released (this has not been necessary to date). Every precaution was taken to ensure the health of the bears.

Followit Telus Iridium satellite collars were deployed, and small backup transmitters were attached to the satellite collars. The collars have integrated remote release mechanisms, and canvass rot-off



Figure 1. Sedated grizzly bear in a culvert trap. This bear was awaiting release in a safe location.

sections. Both the satellite collar and backup transmitter transmit VHF signals. Transponders were inserted under the skin on the nose to identify previously handled bears that have lost their collars. The collar transmitter sends signals to a satellite that relays the location coordinates to Followit, and the UTM coordinates for the bear's locations are posted to their password protected website.

After processing, bears were returned to the culvert trap. Once bears were fully recovered from the drug, they were released in a location that minimized risk to the bears and to park visitors. Usually, we waited until dusk when human activity was low to minimize the chances for conflict. If we held bears for more than an hour, we ensured that the trap was kept in a cool, shaded location, and the bear was given water every 2 hours. Bears were observed during and immediately after release to ensure that they were moving normally.

After each capture, fRI provided a copy of the capture data sheet to JNP. At the end of each field season, fRI sends a copy of all bear location data to JNP, as well as bear ages. All data are entered into our grizzly bear telemetry database. Capture data is also copied to the JNP telemetry database for all species (for general access).

At the end of the 2018 data collection season, JNP and fRI will calculate a resource selection function (RSF) for bears in JNP, as well as on AB lands. An RSF is a statistical estimate of the probability of habitat use across the landscape. Parameters will be calculated that quantify the relative strength of selection for various habitat variables.

Results

In 2015 we caught and collared 10 grizzly bears (Table 1). Eight were caught in culvert traps, one by helicopter darting, and one by free range darting. Of the 10 collars put on in 2015, one was removed by a bear in 2015, and two more were removed by bears in 2016 (all by male bears). One of the 2015 collars stopped working in 2016 and was remotely released and recovered. Two other bears caught in Alberta used JNP to some degree – one of these collars stopped working, was remotely released and recovered.

Table 1. Grizzly bear captures in JNP, 2015 and 2016 (recaptures are bolded).

JNP ID	FRI ID	Year	Capture Method	Capture Date	Weight (lbs)	Northing	Easting	Sex	Age
195	G133	2015	Culvert	02/05/2015	272	5860294	430229	M	11
196	G158	2015	Heli-dart	11/05/2015	200	5841532	491028	F	7
197	G159	2015	Culvert	11/05/2015	176	5856798	426532	M	7
198	G134	2015	Culvert	14/05/2015	262	5859179	443722	M	9
199	G135	2015	Culvert	18/05/2015	254	5860294	430229	M	8
200	G136	2015	Free-Range	22/05/2015	260	5850857	426655	F	10
201	G137	2015	Culvert	30/05/2015	196	5856424	426748	F	7
202	G138	2015	Culvert	22/06/2015	372	5804916	499981	M	12
203	G139	2015	Culvert	15/09/2015	134	5841830	456158	M	3
204	G140	2015	Culvert	28/09/2015	234	5860294	430229	F	10
195	G133	2016	Culvert	14/05/2016	420	5860301	430236	M	12
196	G158	2016	Heli-dart	30/08/2016	304	5833872	495949	F	8
209	G141	2016	Culvert	30/04/2016	176	5860301	430236	M	
214	G142	2016	Heli-dart	13/05/2016	108	5851290	441913	M	
215	G160	2016	Heli-dart	16/04/2016	270	5841620	487263	M	

In 2016, 5 bears were caught: two bears in culvert traps, and three by helicopter darting (Table 1). Two were recaptures of JNP bears originally caught in 2015. One of the bears captured in 2016 was illegally killed in 2016 near Hinton, AB. Another of the 2016 collars stopped functioning, was remotely released and the collar was recovered. In the fall of 2016, the nine functioning collars were programmed to go off the air when they entered their dens.

Eight males and 4 females have been caught so far (Table 1). Ages at capture ranged from 3 to 12 (Table 1). Female bears ranged from 134 to 304 pounds and averaged 221 pounds (Table 1). Male bears ranged from 108 to 420 pounds and averaged 257 pounds (Table 1). Male bear 195 gained 148 pounds between 2015 and 2016.

We have not caused any mortalities or serious injuries to grizzly bears during the trapping process. Two bears broke claws, and two bears broke canine tooth tips. One of the bears that broke 7 claws in 2016 was seen in 2017 and its claws had regrown.

We have had 7 non-target captures (all black bears) during the 2 years of captures. All were released without incident.

Six captures occurred at the Jasper Park Lodge Golf Course. One bear each was caught at each of the other 10 locations. Eleven captures were by culvert trap, four were heli-darting, and one was a free range darting (Figure 2).

Collars are designed to last 2.5 years. If we examine collar life between 2015 and the start of the 2017 field season, just over 60% of the collars made it to their maximum operational life at the time of calculation (Figure 3).

To date, just over 70,000 GPS bear locations have been recorded in the JNP database.

One of the bears captured in 2015 was a female that had killed three elk calves over a 3 day period in Whistlers

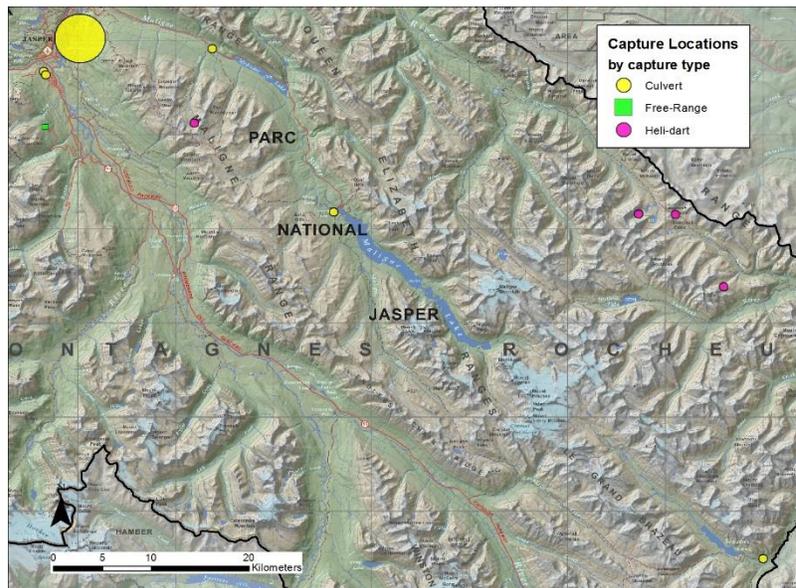


Figure 3. Grizzly Bear capture locations, 2015 and 2016. Six captures were at the Jasper Park Lodge golf course (large yellow dot). All other locations were single captures.

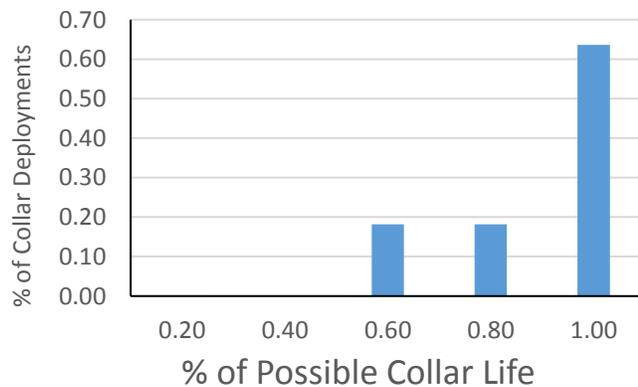


Figure 2. Actual collar life as a percentage of possible collar life. $N = 10$ for 2015 captures (possible life = 2 years), and $n=4$ for 2016 bears (possible life = 1 year).

Campground. We suspected that she would continue to hunt calves in the area, putting her in direct conflict with people, so she was translocated 100km south of the Jasper townsite and released. After 10 days, she returned to within 1.5 km south of the townsite, but did not re-enter the campground and spent most of the remainder of the 2015 season in the Maligne Valley. No further conflicts with people were recorded in 2015 or 2016.

It is premature to statistically describe bear movements or habitat use, but as a general note, our collared bears have tended to occupy high human use areas more in the spring – in summer, they tended to occupy higher elevation areas away from town. A smaller number of bears returned to the town area in the fall.

Discussion

Of all the collars deployed in JNP, only about 60% lasted to their advertised operational life (Figure 3). This is less successful than anticipated, so fRI is working with the Followit company to resolve the issue.

We are attempting to catch as many as 4 bears in the spring of 2017. Collars will be remotely released and collected after the 2018 field season. Data analysis and paper submissions will begin after the last season of data collection.

The telemetry program is proving to be useful for tracking bears for human wildlife conflict purposes. Our understanding of how bears use the townsite vicinity, and where they go when they're away from town is increasing dramatically. The only bear specifically captured because of risk to people (bear 201 trapped in Whistlers Campground) was successfully translocated, and we were able to determine that she was not a problem bear for the remainder of 2015 and all of 2016.

Literature Cited

- Boulanger, J., M. Bradley, and G. B. Stenhouse. 2016. Estimates of population size and density of black bears from the 2014 South Jasper National Park DNA mark-recapture inventory. Parks Canada Report:22 pp.
- Nielsen, S. E., M. S. Boyce, G. B. Stenhouse, and R. H. M. Munro. 2003. Development and testing of phenologically driven grizzly bear habitat models. *Ecoscience* **10**:1-10.
- Stenhouse, G. B., J. Boulanger, M. G. Efford, S. Rovang, T. McKay, A. Sorensen, and K. L. Graham. 2015. Estimates of grizzly bear population size and density for the 2014 Alberta Yellowhead Population Unit (BMA 3) and South Jasper National Park Inventory Project. FRI Research:64 pp.