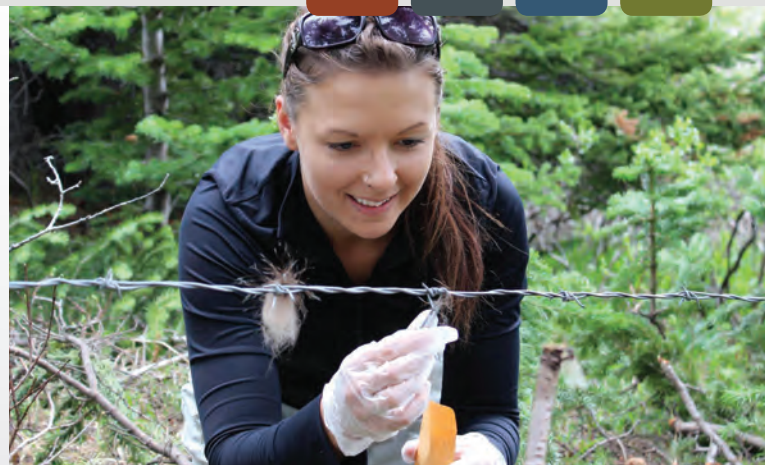Photo credit: Mark Bradley

Estimates of Grizzly Bear Population Size and Density

for the 2014 Alberta Yellowhead Population Unit (BMA 3) and South Jasper National Park Inventory Project:

Quick Facts, FAQ and Map

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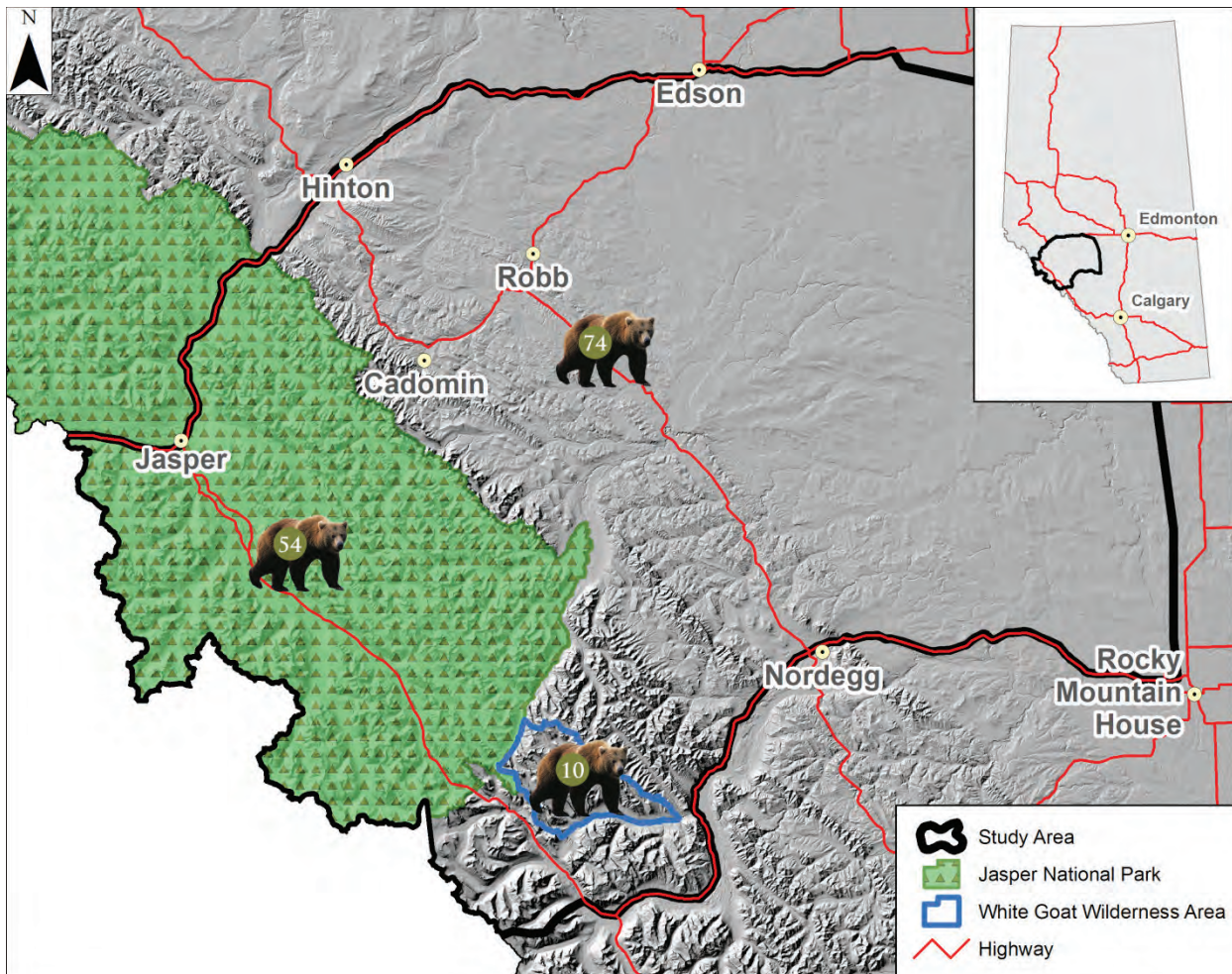# In Brief: 2014 Grizzly Bear Population Estimate Report

Grizzly bears have been listed as a threatened species in Alberta since 2010. Recovery plans benefit from good data on how many bears there are and where they live. The first grizzly bear population inventory in Bear Management Area (BMA) 3 was undertaken in 2004 by fRI Research on behalf of the provincial government. The 2004 work did not include Jasper National Park (JNP).

Ten years later, fRI Research, in partnership with Weyerhaeuser, West Fraser, Alberta Environment and Parks, and Parks Canada, did the first repeat inventory of BMA 3 to find out how the grizzly bear population has changed. This time, our team also did population estimates for south Jasper National Park as well as White Goat Wilderness Area.

The 2014 population estimate for grizzly bears in BMA 3 is 74, up from 36 bears in 2004. The confidence interval (CI) for the 2014 estimate is 56–98 bears, and for 2004, it is 27–45. This works out to an annual increase of approximately 7%.

The population estimate for White Goat Wilderness Area is 10 (CI=8–14).

The research team also did the first inventory of JNP south of Highway 16, and estimate the population there to be 54 bears (CI=40–73). Combining this with a separate 2008 estimate for north JNP results in a total of 113 grizzly bears in the entire park.

Quick Facts

Study Goals

Determine the grizzly bear population size and distribution in BMA 3, JNP and White Goat Wilderness Area (WG).

Compare the 2014 grizzly bear population estimate in BMA 3 to the 2004 estimate.

Population Estimates

BMA 3
2014: **74** (CI=56–98)
2004: **36** (CI=27–45)

WG
10 (CI=8–14)

JNP
South: **54** (CI=40–73)
Total: **113**

Implications

The grizzly bear population in BMA 3 has increased over the last 10 years at a rate of about 7% per year. This information has been provided to the provincial government to help inform recovery planning and management actions for this threatened species.

Methods

The field crews collected grizzly bear hair samples from over 250 sites in the study area. We used the DNA from the hair to estimate the population size.

Acknowledgements

fRI Research planned and conducted this work with funding and support from Weyerhaeuser, West Fraser, Alberta Environment and Parks and Parks Canada.

More Information

friresearch.ca

gbp.friresearch.ca

Contact

Sean Kinney
Communications and Extension Program Lead
skinney@friresearch.ca
780.865.8329

FAQ

What are the main findings?

We estimate that in BMA 3, there are 74 bears (CI=56–98) in 2014, up from 36 (CI= 29–45) in 2004.

This represents an annual population increase of approximately 7%, which is higher than commonly seen in most interior grizzly bear populations in North America.

There are an estimated 54 bears in south JNP (CI=40–73). Assuming that bear density is the same as it was when the northern half of the park was studied in 2008, we estimate there are 113 bears in JNP total.

We also estimate that there are 10 grizzly bears in White Goat Wilderness Area.

What does CI mean?

In these vast, remote areas, it's impossible to count every single bear and know for sure that we haven't missed one. So we detect as many as we can and then use statistics to estimate what the real population is. The statistics don't just tell us the estimated number of bears (the point estimate); it also tells us how confident we can be in that estimate.

CI stands for confidence interval. In our case, (CI=56–98) means that if we did the study over and over again, then 19 times out of 20, we'd get a point estimate of between 56 and 98 bears.

Why was this study done?

Grizzly bears are culturally, economically and ecologically important, and since 2010, they have been listed as a threatened species. Up-to-date, accurate information is critical to making good recovery plans and evaluating progress in managing this species.

Who did this work?

The study was planned and carried out by fRI Research, with funding and support from Weyerhaeuser, West Fraser, the Government of Alberta, Parks Canada and fRI Research.

There were 7 authors of the report: Gord Stenhouse, Sarah Rovang, Tracy McKay, Anja Sorensen and Karen Graham of fRI Research, John Boulanger of Integrated Ecological Research and Murray Efford of the University of Otago.

The field crew of 18, plus many more volunteers and support staff, collected the data.

fRI Research staff provided GIS and data management, the Wildlife Genetics International lab in B.C. did the DNA sequencing and we had two helicopter pilots.

How was the study done?

Field crews went to 197 sites in BMA 3 and another 74 in JNP to collect grizzly bear hair samples. DNA from the hairs was then extracted and sequenced to uniquely identify each bear. This prevents us from counting the same bear twice and lets us track a bear's movement if it leaves hair at more than one site. It also allows us to identify family relationships, sex and other characteristics to better understand the population.

We then used a robust statistical model called SECR (Spatially Explicit Capture-Recapture), which lets us figure out how many bears we were likely to have missed. It also tells us how many of the bears that we did detect are likely part of another population and were just visiting our study area. This gives us the best estimate of the current population in the area.

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How was the hair collected?

The field crew set up scent lures at sites in BMA 3, JNP and White Goat Wilderness Area. A scent lure is a couple liters of rotten cattle blood mixed with canola oil poured on a pile of branches and moss. Then they made a 50m barbed wire perimeter around the pile.

The scent lure encourages bears to climb under or over the barbed wire without providing a food reward. Because bear fur is so thick, bears aren't scratched by the wire, but they do leave tufts of hair called "snags".

Every two weeks, the field crew checked the sites to collect the hair samples and refresh the scent lure.

In JNP we also used "rub trees" – known spots that bears come to – as sites to collect hair.

Where was this study done?

The study was done in 3 places: BMA 3, south JNP and White Goat Wilderness Area.

Alberta grizzly bear habitat is divided into seven Bear Management Areas. BMA 3 is the foothills area east of JNP. Specifically, it is the 9,650 km2 area south of Highway 16 between JNP on the west approximately to Highway 22 on the east. It extends as far south as Highway 11.

The south JNP area is the entire 7,063 km2 portion of the park south of Highway 16 to the border with Banff National Park.

The White Goat Wilderness Area is just east of the border between Jasper and Banff National Parks.

The study areas were sampled separately for logistical reasons, but the data analysis integrated all three areas and allowed for the movement of bears across boundaries.

The study area has some very different habitats, from barren rock up at 3,365m to wetlands as low as 880m in elevation, with subalpine, uplands, lowlands and riparian forests in between.

Why has this bear population increased?

It's too soon to know. More study is needed to understand the effect different management actions have had.

To take just two examples, we know that the hunting moratorium has reduced overall human-caused bear mortality. As well, between 2004 and 2014, enforcement officers relocated about 30 bears into BMA 3. It will be important to study the effects of the hunting moratorium and the management practice of bear relocation. A combination of factors may be responsible for this increase.

Does this mean grizzly bears have recovered? What will happen with the hunting moratorium?

These policy decisions are made by Alberta Environment and Parks.

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