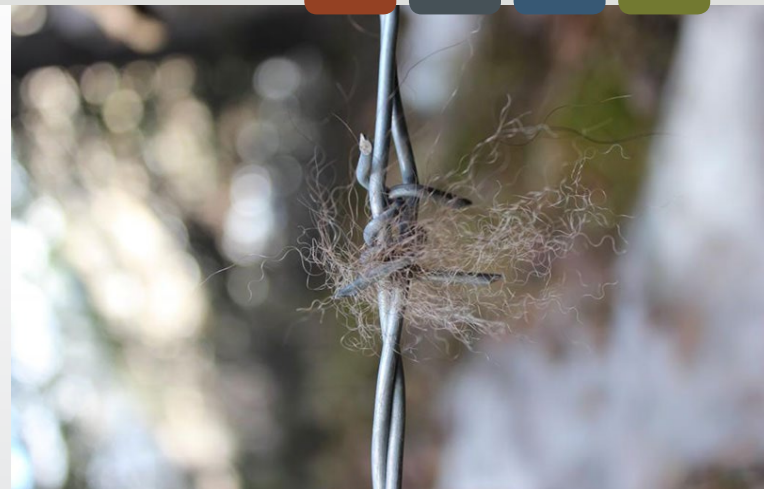Photo credit: Mark Bradley

2018 Estimates of Grizzly Bear Populations for BMAs 4 and 7
Summary, Map & FAQ

fRI Research Grizzly Bear Program

March 2021

fRI Research
Informing Land & Resource Management

2018 Grizzly Bear Population Estimates

Grizzly bears have been listed as a threatened species in Alberta since 2010. As part of provincial recovery efforts, it is important to understand how many bears there are and where they live. The fRI Research Grizzly Bear Program conducted grizzly bear population inventories in Bear Management Area 3 (in 2004), BMA 4 (in 2005), and the first repeat survey in the province in 2014 when we revisited BMA 3.

In 2018, the Grizzly Bear Program partnered with Alberta Environment and Parks, Millar Western, Spray Lakes Sawmills, Vanderwell Contractors, and West Fraser Mills to do two more population inventories: a re-survey of BMA 4, and the first ever grizzly bear count in BMA 7, the last management unit in the province to be surveyed.

The 2018 population estimate for grizzly bears in **BMA 4** is **88**, up from 42 bears found in 2005**.** There are 59 – 130 bears living in this area. In 2005, it was 32 – 50 bears. This means that the population has doubled in 13 years, which works out to an annual rate of increase of 6%.

The first ever estimate for grizzly bears in **BMA 7** had low precision due to low detection rates. 39 unique bears were identified and it is recommended that a population estimate of **62** bears be used for management purposes.

Objectives
Obtain an up-to-date estimate of grizzly bear numbers in BMAs 4 and 7.

Methods
The field crews collected grizzly bear hair samples from **nearly 400 sites** between the two study areas. We used the **DNA from the hair** to count bears and estimate the population size.

Implications
The grizzly bear population in BMA 4 **has doubled in size since the first inventory work in 2005.** For the first time ever, BMA 7 has been surveyed, with an estimated population of 62 grizzly bears. This information has been provided to the provincial government to help inform recovery planning and management actions for this threatened species.

Acknowledgements
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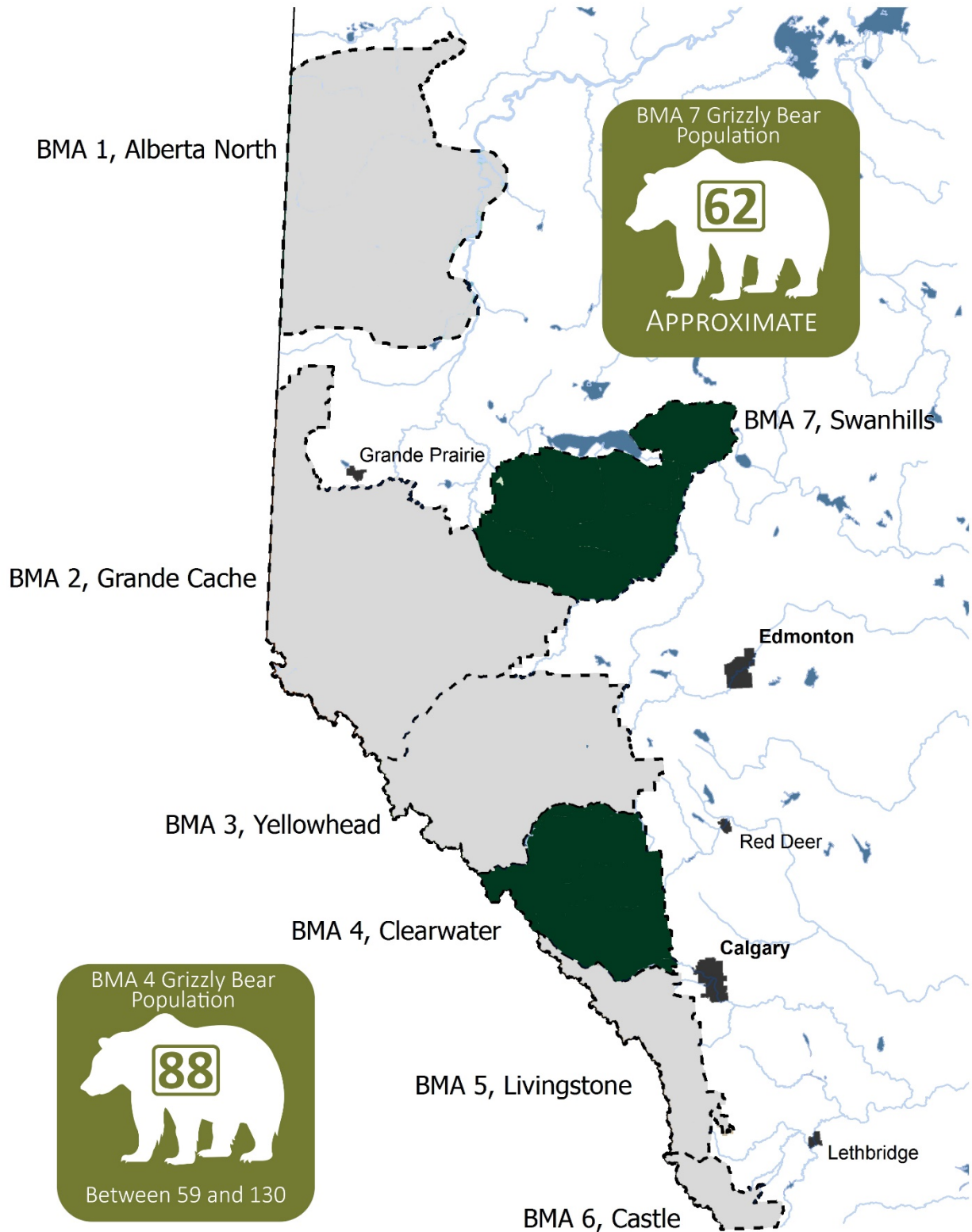
More Information
https://friresearch.ca/resource/bma-4-estimates-grizzly-bear-population-size-and-density
https://friresearch.ca/resource/bma-7-estimates-grizzly-bear-population-size-and-density

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BMA 1, Alberta North

BMA 7 Grizzly Bear Population

62

APPROXIMATE

BMA 7, Swanhills

Grande Prairie

BMA 2, Grande Cache

Edmonton

BMA 3, Yellowhead

Red Deer

BMA 4, Clearwater

BMA 4 Grizzly Bear Population

88

Between 59 and 130

Calgary

BMA 5, Livingstone

Lethbridge

BMA 6, Castle

fRI Research

FAQ

What are the main findings?

In 2018, BMA 4 had an estimated 88 grizzly bears (CI = 59–130) and a density of 9.64 grizzlies per 1,000 km². This indicates an increasing population of grizzly bears in BMA 4, which has more than doubled in size since the previous population inventory work in 2005. The 6% increase per year is a bit higher than normally seen in North America, but is in line with the 7% increase per year that we found in BMA 3 in 2014.

In BMA 7, we estimated that there were 12.6 bears per 1,000 km² and 118 (CI= 62-226) bears living in the area. However, the precision of these estimates was low, suggesting that they should be interpreted cautiously. We note that the lower bound of the CI is **62**, which corresponds to the estimate of bears if we use detection rates found in other BMA's.

What does CI mean?

CI stands for confidence interval. 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 tell us the estimated number of bears (the point estimate) as well as how confident we can be in that estimate.

In our case for BMA 4, (CI=59–130) 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 59 and 130 bears.

Why was the BMA 7 estimate less precise?

We didn't redetect, as many bears as we normally do. There were 39 individual bear identified using DNA so we do know that is

the minimum number of bears. We have our theories about why, but we don't know for sure. One possibility is that there were so many black bears in the area that they influenced grizzly bears coming into the sampling site and possibly that black bears often messed up the hair snag sites before a grizzly bear arrived.

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 support recovery actions and evaluating progress in managing this species.

Who did this work?

fRI Research planned and conducted this work with funding and support from FRIAA, **Alberta Environment and Parks, Millar Western, Spray Lakes Sawmills, Vanderwell Contractors, and West Fraser Mills**.

The field crew of 23 collected the data.

Gordon Stenhouse, Karen Graham, Isobel Phoebus, Cameron McClelland, Anja Sorensen, and Karine Pigeon from fRI Research, and John Boulanger of Integrated Ecological Research analyzed the data and wrote the reports.

fRI Research staff provided GIS and data management support, Wildlife Genetics International in BC did the DNA analysis.

How was the estimate done?

Field crews went to 173 sites in BMA 4 and 200 in BMA 7 to collect grizzly bear hair samples. DNA from the hairs was then extracted and sequenced to identify each bear. This prevents us from counting the

same bear twice 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 gold standard statistical model called Spatially Explicit Capture-Recapture, which lets us figure out how many bears we likely missed. It also tells us how many of the bears that we did detect were actually part of another population and just visiting our study area. This gives us the best estimate of the current population in the area.

How was the hair collected?
The field crew set up scent lures at nearly 400 sites in BMA 3 and BMA 7. 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 on the barbs.

The field crew checked sites every 10 days to collect the hair samples and refresh the scent lure.

Where was this study done?
The study was done in two of Alberta's seven Bear Management Areas.

BMA 4 is the **foothills area east of Banff National Park.** Specifically, it is the 7252 km^2 area north of Highway 1 and south of Highway 11, between Banff National Park on the west to Highway 22 on the east.

BMA 7 is a 9,800 km^2 area of **boreal forest south of Lesser Slave Lake**. It is bounded by Highways 2, 43, and the Athabasca River

The study areas have some very different habitats, from barren rock up at 3,500 m to wetlands as low as 650m in elevation, with subalpine, uplands, lowlands and riparian forests in between.

Why has this bear population increased in BMA 4?
It's too soon to know. However, work is now underway to determine how changing landscape conditions between 2005 and 2018 may have contributes to the observed population increase.