Mid-Term
Project Report

Yukon North Slope Grizzly Bear Population Study

"I notice that the relationship that bears have with the land is incredibly dynamic. They are sensitive to the changes in the weather, the food they eat and the way people use the land. This is why we monitor them—to make sure that the changes do not cause them to disappear from the landscape completely." — Ramona Maraj

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An introduction to the project

In May 2004, Environment Yukon, in partnership with Parks Canada (Western Arctic Field Unit), the Aklavik Hunters and Trappers Committee, and the Wildlife Management Advisory Council (North Slope), began a six-year grizzly bear research project on the Yukon North Slope. The research project is made up of several different studies and activities, and is designed to learn about grizzly bear population size, birth rate, death rate, where bears can be found at different times of year, and how much they move around. The project also includes a review of harvest activity. Together, the various activities will give wildlife managers the kind of information they need to know when determining the conservation requirements of this population and in reviewing harvest quotas. All research activities are partly funded through the Inuvialuit Final Agreement.

It is important that we know more about how many grizzly bears there are on the Yukon North Slope. It has been over 35 years since the last population survey was done. The Inuvialuit Final Agreement recognizes the need to balance species conservation and the harvesting rights of the Inuvialuit. To make sure bear populations remain at a healthy level, wildlife managers and hunters need to know as much as possible when they discuss harvest quotas. Population size and how fast it is growing are important factors. Population size is usually estimated using different kinds of information. The number of bears that are born and die each year (including those harvested), the number of males and females and their ages are all considered. It is important to calculate the number of bears that move in and out of the area since this also affects the total number. Knowing what is available to eat at different times of year can influence the number of bears as well.

After four years of study, much information has already been gathered. The next two years will see the continuation of this research to give community members and wildlife managers a clear picture of the status of grizzly bears on the Yukon North Slope.

What do we want to find out?

Yukon Government

Goals

The goals of this study are:

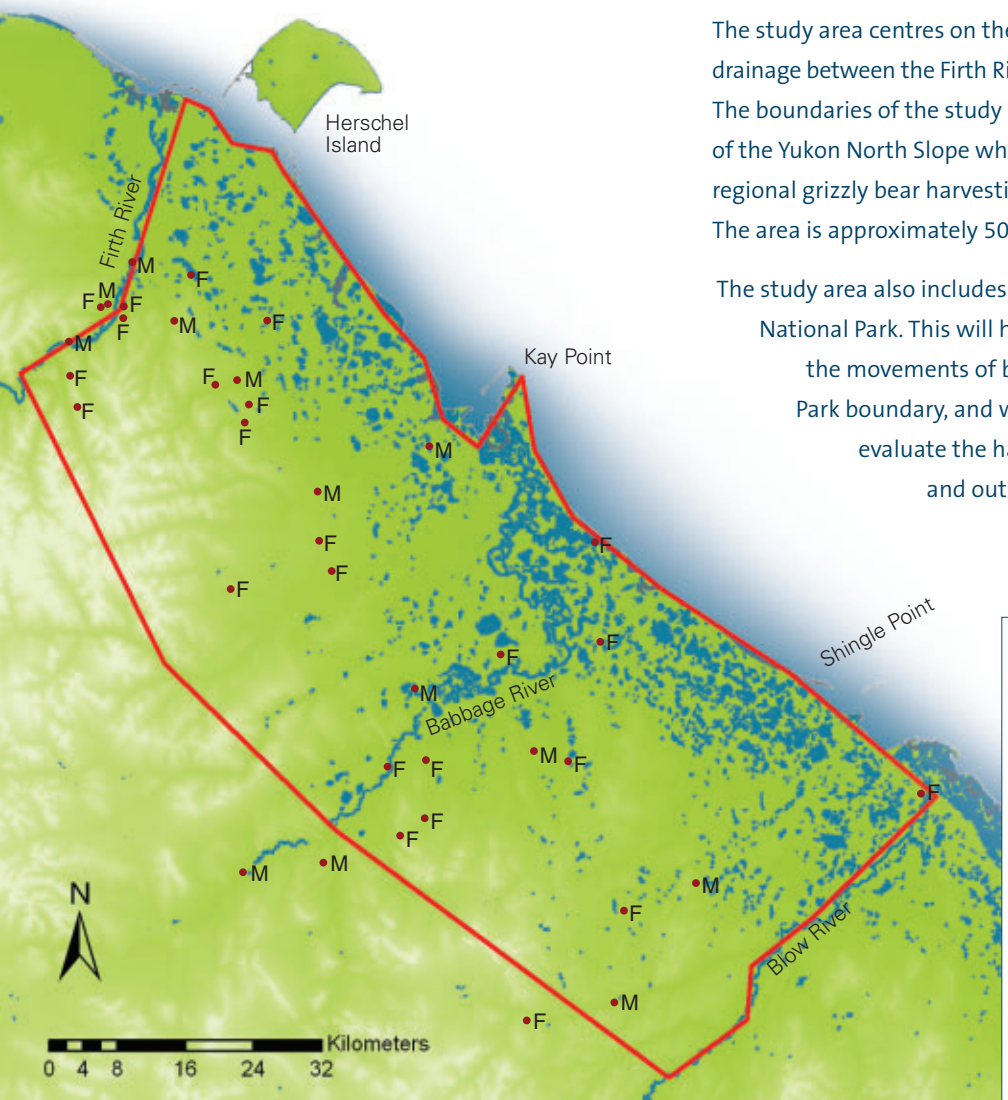
1. Gather and use information to help reassess current harvest quotas and help ensure that grizzly bears on the Yukon North Slope are managed in a sustainable manner.
2. Identify potential conservation issues for the grizzly bear population on the Yukon North Slope.

Objectives

The six-year study has the following objectives:

1. Estimate grizzly bear numbers by age, the number of bears in each age class, the number of males and females, and the total number of bears. These values will be used to estimate the birth rate, the death rate, and the rate at which the population is increasing.
2. Update information on sex, age, physical characteristics and location of hunter-killed bears in the study area to understand how harvesting might affect the bear population.
3. Gather traditional knowledge on grizzly bear population dynamics, movement, and Inuvialuit harvesting practices. Determine how to integrate traditional knowledge and scientific management.
4. Collect and analyze information on the habitat use, the location of bears, and the movements of bears throughout the Yukon North Slope.
5. Develop a program for long-term monitoring of bears on the Yukon North Slope.

Study area



The study area centres on the Babbage River drainage between the Firth River and the Blow River. The boundaries of the study area surround the part of the Yukon North Slope where most Inuvialuit regional grizzly bear harvesting activity takes place. The area is approximately 5000 km^2.

The study area also includes portions of Ivvavik National Park. This will help us understand the movements of bears across the Park boundary, and will enable us to evaluate the harvest quotas inside and outside of the Park.

North Slope Grizzly Bear Captures through 2006

- ● bears listed by gender
- ▭ study area boundary

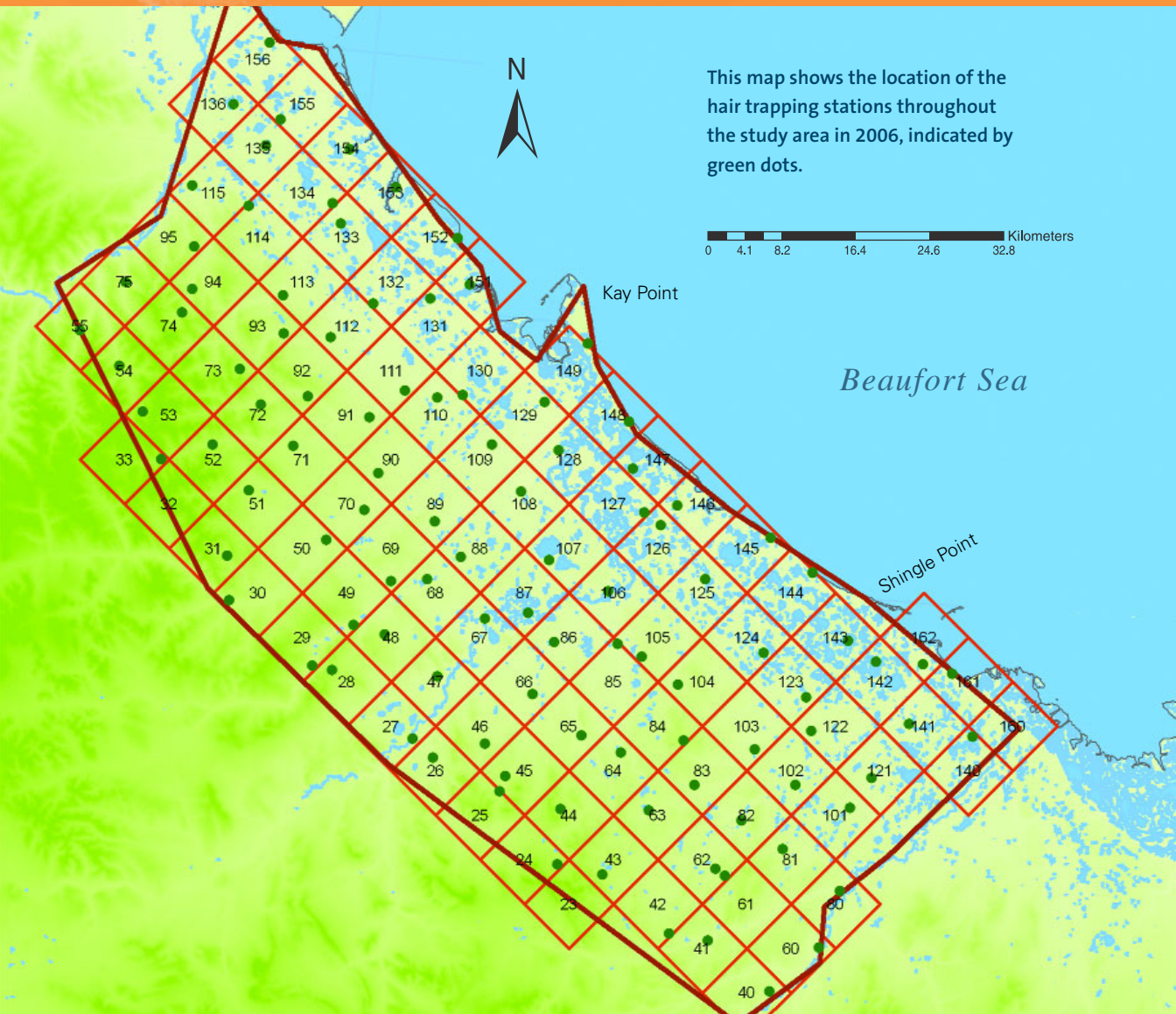
What does this study involve?

Ramona Maraj

The study includes projects to gather information from local residents as well as some science-based projects. Researchers are working with Aklavik Inuvialuit residents to record their observations of bear activity and to gather information on harvesting. A DNA mark-recapture study is providing information on movement and population size by collecting hair samples from bears using special traps. GPS and radio collars will be used to follow bear movements and to find out what habitat the bears are using at different times of year. This part of the study is designed to determine how changes in habitat can influence population size and movements. The habitat work can also provide population estimates based on the amount of good habitat for bears.

DNA mark-recapture (hair sampling grid)

The DNA mark-recapture study is providing information on grizzly bear movement and population size. The main focus of the 2006 and 2007 summer field seasons was to set up the first DNA mark-recapture grid to get more information about the number of bears in the study area. This part of the study involves using a hair snagging program. Biologists set up over 100 hair trapping stations at different locations across the Yukon North Slope. The stations remained in place for the duration of the season. Biologists visited the stations every nine or ten days from June through late July to collect samples. The hair samples will allow biologists to identify individual bears using DNA analysis.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This map shows the location of the hair trapping stations throughout the study area in 2006, indicated by green dots.
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GPS and radio collaring

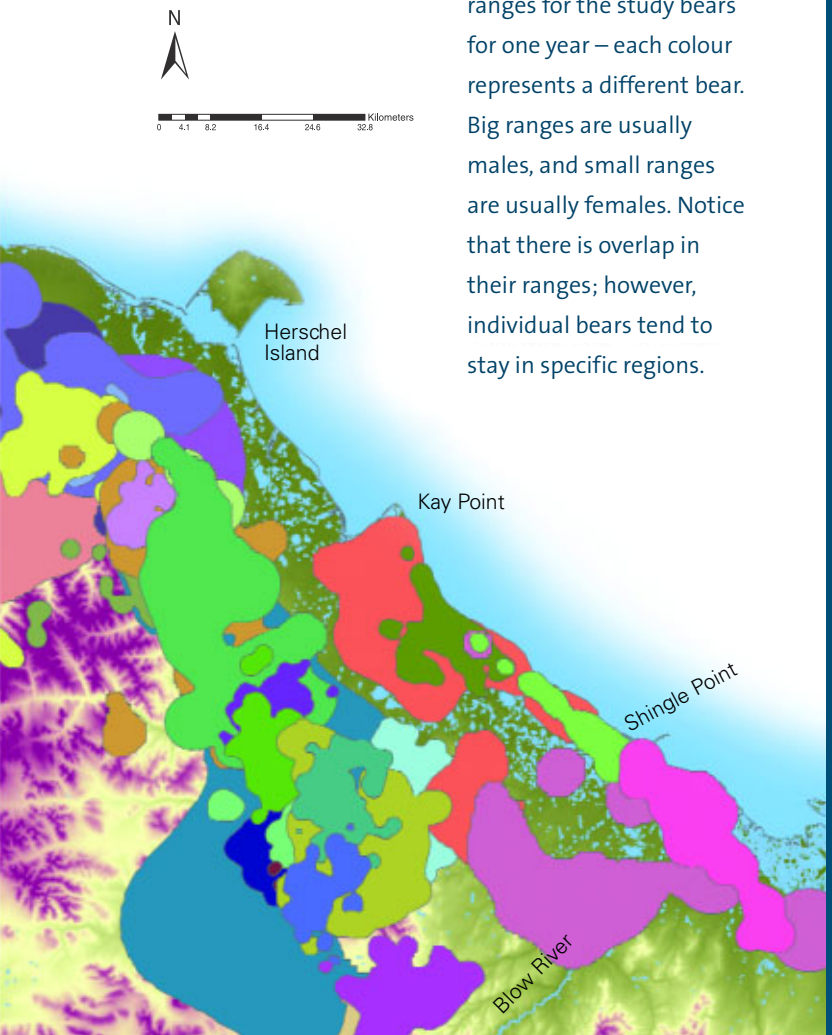
Yukon Government

As part of the research project, biologists are using GPS and radio collars to follow bear movement and to find out what habitat bears are using throughout the year. This part of the project is designed to determine how changes in habitat can influence population size and movements. Biologists are also investigating how long grizzly bears stay in an area of the Yukon North Slope and how far they range.

Biologists must capture the bears in order to fit them with a radio collar. Capturing the bears also gives researchers a chance to get other important information such as age, sex, weight, length, girth, head size, and physical condition. Blood, tooth, scat and hair samples are collected to be analyzed. Great care was taken to ensure the grizzly bears were safe and comfortable at all times while being collared. Temperature, breathing and heart rate were continually monitored to be sure the bear was okay while under the influence of the drug. Grizzly bears were captured and collared during the 2004, 2005, 2006, and 2007 field seasons. In 2004, 10 bears were collared. Some of the collars were defective and the bears had to be relocated to be given new collars. In 2005, 30 bears were collared. Some of these were the same bears that were first collared in 2004. In 2006, a further eight bears were captured/recaptured. In 2007, three bears were captured/recaptured. Regrettably, one female bear drowned during captures in 2007. So far, 41 grizzly bears have been collared. Some bears have pulled their collars off, so only about 15 – 30 bears are collared at a time.

The collars contain GPS units which record the bears' locations every four hours. The information is stored in the collar and can only be retrieved by flying over the bear or by recovering the collar. The collars send off radio signals so that bears can be tracked and located during flights over the area. When weather co-operates, these flights take place every three or four weeks over the summer and fall of each field season to locate the bears and retrieve information recorded by the radio collars. It is also a chance to check bear survival.

Home ranges



This map shows the home ranges for the study bears for one year – each colour represents a different bear. Big ranges are usually males, and small ranges are usually females. Notice that there is overlap in their ranges; however, individual bears tend to stay in specific regions.

The process of capturing and handling

Animals are treated with respect and great care when they are captured and handled. For the well-being of the animal and the safety of the handlers, it is best that the animal be relaxed and unaware of what is going on when it is handled. Using drugs to put an animal into a sleep-like state is the most humane way of handling large, powerful animals.

A helicopter is used when doing the capture work because biologists need to be close to the animal to inject the drugs and keep the animal away from water. The helicopter and crew stay close to the bear while the drug starts to take effect. This usually takes about five minutes. The darting is done by biologists who have extensive experience capturing large animals and special training in wildlife handling and drugging.

The drug used in this study is called Telazol. It is considered to be very safe for the animal as well as safe for the humans who handle it. The drug allows bears to breathe normally. Normal breathing helps keep their body temperature at the right level so they don't get too hot or stressed by the capture. The drugged animal is closely monitored when it is being handled. Biologists usually have about an hour to do their work before a bear will begin to wake up and move its head. Within another hour the bears are usually back on their feet.

What have we learned so far?

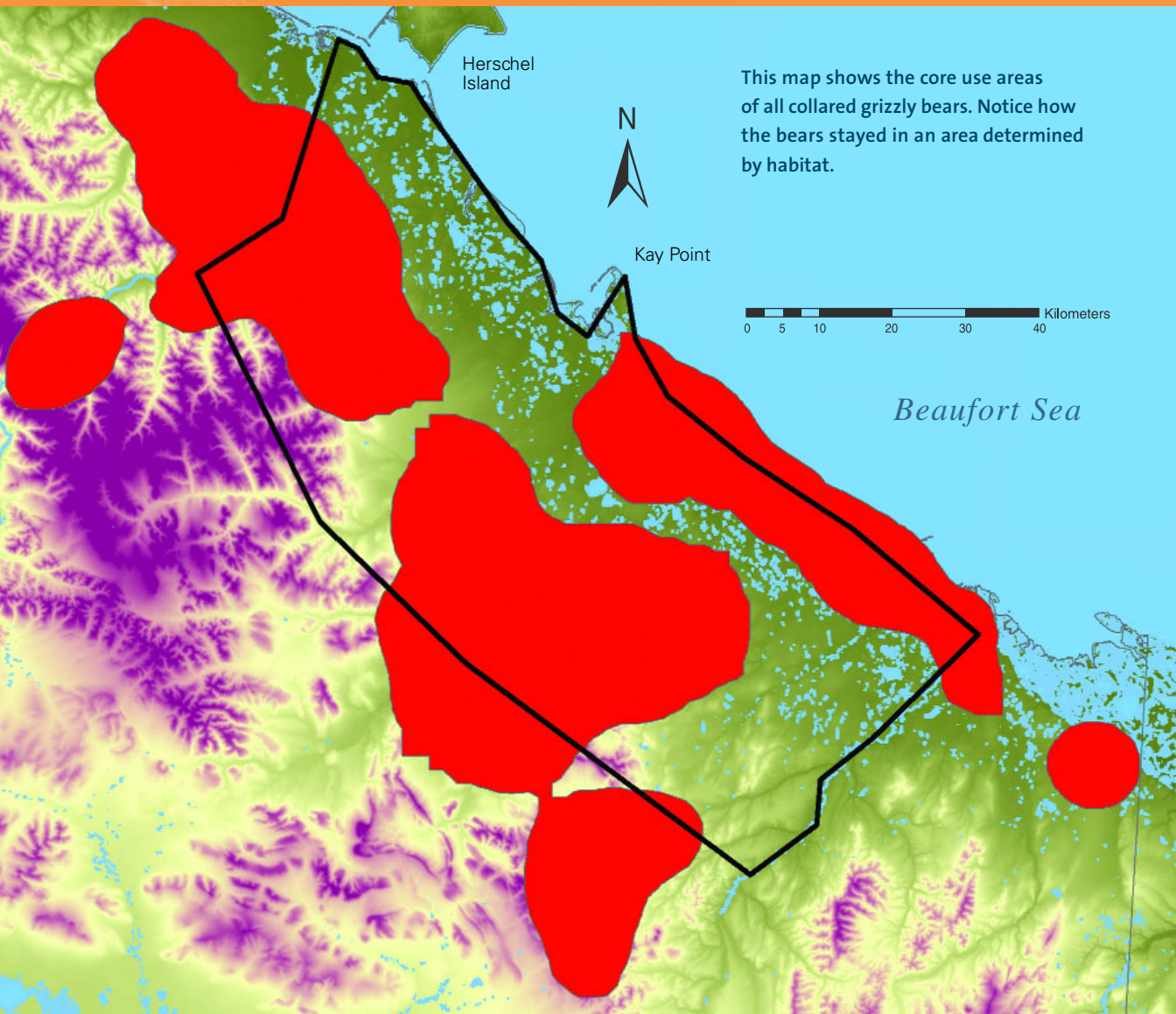
Yukon Government

Biologists have learned a lot from the information they have gathered so far. Weight and size information is used to understand growth rates. It is also used to understand the health and condition of each grizzly bear and of the population as a whole. Information from tracking the bears is used to put together a picture of annual home ranges. It is interesting to see how far and how fast each bear has moved since being collared. Laboratory work has included determining the age of each bear from the teeth that were pulled. By collecting scat, biologists have learned what the grizzly bears are eating.

In the upcoming two to three years, researchers will continue to conduct flights to gather information about the collared bears. They will also maintain the current collars, conduct vegetation analysis, collect scat, and analyze the data they are gathering through these various activities. When the study is complete, the collars will be removed from the grizzly bears.

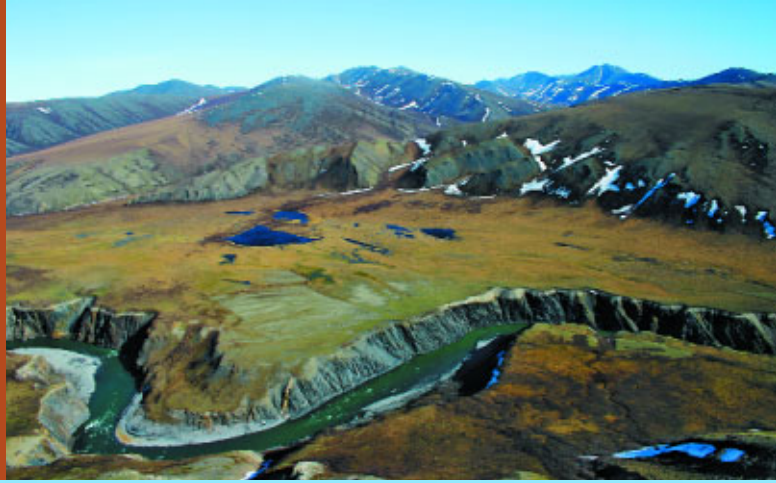
Interesting facts about the collared grizzly bears:

- The average female home range is 190 km^2.
- The average male home range is 1020 km^2.
- The largest annual home range was a male grizzly bear that went over 3000 km^2.
- The smallest grizzly bear captured was 136.7 lbs (female).
- The largest grizzly bear captured was 509 lbs. (male).
- The average weight for female grizzly bears was 217.6 lbs.
- The average weight for male grizzly bears was 322.7 lbs.
- Grizzly bears ranged in age from 4 to 28 years old, measured by examining a pulled tooth.



This map shows the core use areas of all collared grizzly bears. Notice how the bears stayed in an area determined by habitat.

Aerial surveys to count grizzly bears



Yukon Government photos

In the summer of 2005, biologists began experimenting with a method that uses two people to count grizzly bears from an airplane. It is very hard to be sure you are counting all bears and not missing any when you fly over a vast area. Researchers hoped that by having two people counting bears at the same time, they would be able to get a more accurate number.

Unfortunately, bad weather caused a lot of problems. Even when the weather improved, it was only possible to fly along the coastal plain. Only five grizzly bears were counted in one day of flying over a two-week period. Biologists did not feel this was an accurate assessment of the number of bears.

There are no plans to do any further aerial surveys to count grizzly bears. Aerial surveys will continue to be done to monitor cub survival.

Denning surveys

During the fieldwork in the fall of 2004, researchers found that the female grizzly bears started digging dens around the last week of September. By mid-October, all females were in their dens and most males had dug a den. By October 20th, only one of the four males collared during the summer had not dug a den. Grizzly bear dens were found on the coastal plain as well as in the mountains.

Once the bears had left their dens in the spring of 2005, biologists returned to a number of sites they had located in the fall. They collected scat and hair samples, and recorded the size and shape of the den. They also discovered that one female grizzly bear had made a very large bed of crowberry plants at the entrance of her den. There are no crowberries growing in the area where the den was located. The bear had to bring the shrubs to her den from quite far away.

Monitoring den sites will continue in the next years of the study.

Inuvialuit observations

Michelle Sicotte

Traditional knowledge and involvement of the Inuvialuit is an important part of grizzly bear management in the Inuvialuit Settlement Region. Inuvialuit harvesters and Aklavik Inuvialuit residents contribute information about grizzly bear activities, numbers and distribution that is important to the success of this study.

The traditional knowledge component of the grizzly bear project began in February 2005. Wildlife managers from Environment Yukon, the Government of the Northwest Territories and Parks Canada spent several days in Aklavik working with the Aklavik Hunters and Trappers Committee (HTC) and local harvesters. Consultation in Aklavik began with discussions on how to incorporate Inuvialuit traditional knowledge and needs for information into the grizzly bear study.

Biologists have a number of important questions they want the study to answer. These questions include what is the sustainable harvest rate for male and female grizzly bears and what areas may need special conservation measures because of their importance in bear denning and cub rearing. Members of the Aklavik HTC and Aklavik Inuvialuit residents reviewed all the biologists' questions and added further questions to make sure that the study also tries to find out what the community would like to know about the grizzly bears.

Biologists also spent time over the winter of 2005/06 gathering information from previous work on grizzly bears done in the community. The focus of this review was the interviews conducted by the Government of the Northwest Territories in 1998/99 and sighting records of Inuvialuit harvesters. An analysis of existing information will allow managers to identify what further information needs to be collected. Biologists also met with a group of Aklavik Inuvialuit harvesters to get initial direction on the gathering of information for the study.

In the winter of 2006, a researcher visited Aklavik to interview people who have been active on the Yukon North Slope for many years and know about grizzly bears. This work allows researchers to understand grizzly bears and their environment from the Inuvialuit traditional knowledge perspective as well as through science.

In January of 2007, more interviews were carried out with Aklavik Inuvialuit residents to increase the amount of Inuvialuit traditional knowledge available to the researchers. A summary report from the interviews will be produced for the community.

The project is also involving Inuvialuit harvesters in the research. Harvesters were given GPS units to track their movements during grizzly bear hunts. The GPS gives harvesters the opportunity to record the location of interesting observations while on the land. It also lets researchers look at where travel corridors for harvesters and grizzly bears overlap. Tracking units were attached to harvester snow machines while harvesters were on the land. These units will be used again in upcoming harvesting seasons. Understanding harvester use patterns will be very important for identifying the population of grizzly bears that is harvested.

Shingle Point

Michelle Sicotte

One part of the program is to work with Aklavik Inuvialuit residents to develop strategies for reducing bear-human conflicts at Shingle Point. At a public meeting in Aklavik in December 2005, Inuvialuit residents expressed concerns about the increase in numbers of bear-human conflicts at Shingle Point. Suggestions were made to set up new garbage incinerators in the area and develop other ways to keep bears away from camps.

A demonstration was held at Shingle Point during Parks Days of 2006. Partners discussed waste management options at Shingle Point and demonstrated the effective use of an incinerator system for disposing of garbage and other waste. Project partners and Aklavik Inuvialuit community members are working together to identify the best kind of incinerators to use at Shingle Point so that bear-human interactions can be reduced in this area.

Education and outreach

One of the highlights of the project has been the development of the Yukon North Slope Grizzly Bear School Program, an educational resource created especially for Moose Kerr School in Aklavik. Educators produced a series of lesson plans for use by classroom teachers and presented them during a visit to the school in March, 2007. The program includes materials and lesson plans to teach students about grizzly bears and bear-human interaction. It is inclusive of the perspectives of biologists who work on the Yukon North Slope as well as of the traditional knowledge of the Aklavik Inuvialuit.

Michelle Sicotte

Communication

Michelle Sicotte

Communication and community involvement are very important to this project.
Since the beginning of the project there have been:

- ten meetings with the Aklavik Hunters and Trappers Committee
- four meetings with the Inuvialuit Game Council
- eleven meetings with the WMAC(NS)
- three meetings with the community of Aklavik
- five newsletters
- three annual newsletters by Parks Canada
- a poster produced and displayed in Aklavik
- a poster produced and displayed at the 2007 North Slope Conference
- a poster produced and displayed at the 2007 Biodiversity Forum
- information leaflet on the use of capture drugs
- one-on-one meetings with Inuvialuit hunters to discuss the results and findings
- communications surrounding capture-related mortality in June 2007
- a Shingle Point incinerator demonstration
- filming of field work and interviews so that visual communication items can be developed
- a workshop for Inuvialuit harvesters to learn how to use the GPS and the tracking units
- Inuvialuit traditional knowledge interviews are being made into a Grizzly Bear Traditional Knowledge Report.
- WMAC(NS) has expanded its website to include more information on grizzly bears. Visit the WMAC (NS) website at www.wmacns.ca.

Next steps

The next three years will be important as researchers continue to gather and analyze data. Field work will include maintaining collars, monitoring den sites, conducting vegetation analysis, collecting scat, collecting hair samples, and carrying out telemetry flights (locating the collared grizzly bears by flying over the area). Finally, the collars will be removed from the grizzly bears and the data will be analyzed by the researchers. The results will be shared in presentations, reports, and management recommendations to the community of Aklavik and the governments involved.

Expected results

All the information gathered over the years will be used to design a program for long-term monitoring of grizzly bears on the Yukon North Slope. Long-term information is critical for understanding anything that could cause changes in grizzly bear population size, behavior or movement, including human activities.

What is a population model?

Population: All of the grizzly bears that occur in a specific habitat; in this case, the Yukon North Slope.

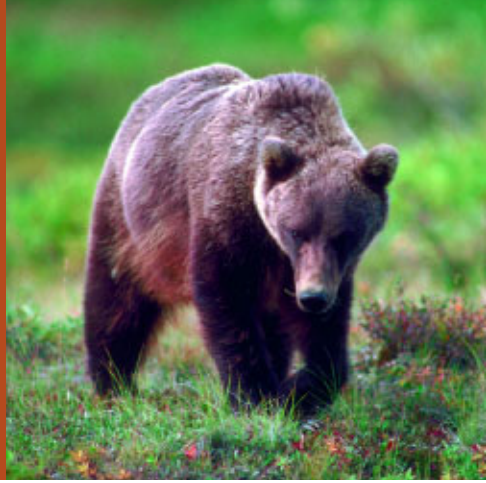
Population is affected by the birth rate, death rate, growth rate, and movement into and out of an area. The grizzly bear population is also affected by human harvesting.

A population model will use the information about the population to look at how the number of grizzly bears grows over time and to determine the number of grizzly bears that can be harvested from a population without affecting long term stability, or average population size.

The final products from this study will be developed once all data has been collected. These products are likely to be produced between 2009 and 2011. The following are the anticipated products from this study:

- a population model
- grizzly bear population estimates for the Yukon North Slope
- a summary of Inuvialuit traditional knowledge on grizzly bears
- an estimate of the number of grizzly bears occupying various habitats (habitat-based density estimates) and maps illustrating grizzly bear movement
- a summary of Inuvialuit harvest patterns
- recommendations on harvesting quotas and bear management

Project partners



Many people and organizations have assisted with the project in various ways, including:

- Environment Yukon
- Parks Canada
- Aklavik Hunters and Trappers Committee
- Wildlife Management Advisory Council (North Slope)
- Inuvialuit Game Council
- Herschel Island Territorial Park
- Polar Continental Shelf Project
- Environment Canada's Species-at-Risk-Fund
- Environment Canada's Habitat Stewardship Program
- Aklavik Inuvialuit
- Northwest Territories Environment and Natural Resources

This project is a shared effort between many individuals and groups. The assistance of all involved is greatly appreciated. The next years of the study will continue to be a success as we partner together to share and gather this important information. Thank you to everyone who has assisted with their time, knowledge, and participation.

Contact information

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Wildlife Management Advisory Council North Slope

Yukon Environment

Hunters & Trappers Committee Aklavik N.W.T.

Parks Canada

Parcs Canada