# Grizzly Bear Research Program

Important information has been gathered over the past four years from the Foothills Model Forest Grizzly Bear Research Program. As a result of this comprehensive and innovative research, the scientific knowledge of grizzly bear behaviour and response to human activities has steadily increased.

This program strives to ensure the continued existence of the grizzly bear in west-central Alberta. Studying and monitoring grizzly bears is however, a challenging task at best. These animals are often difficult to find, and roam vast areas in search of food, mates and den sites. Faced with those challenges, this multi-disciplinary study has armed researchers with the most comprehensive data on grizzly bear movements in North America. Through the continuing work of the *Foothills Model Forest Grizzly Bear Research Program*, and the ongoing co-operation with the program's many partners, efforts will continue to ensure this species lives harmoniously alongside the many other users of Alberta's land base for generations to come.
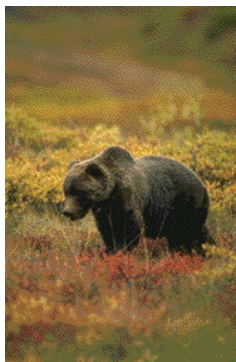
Study Animals
To date, the research team has completed four field seasons. During that time, 61 grizzly bears within the study area have been captured and 34 have been radio collared. Data is now available for location comparisons from many of the same individuals over a four year period.

Both male and female bears of all ages have been collared, thus ensuring research conclusions are based on a representative sample of the population. From this data, researchers have learned that bears exhibit a great deal of home range fidelity.

Interesting variation and changes related to reproductive status have also been uncovered, relative to habitat use.

Two methods of capture – aerial darting and Aldrich foot snares – have been used to monitor grizzly bears within the study area.

The aerial darting technique appears to be less stressful on bears than the Aldrich foot snares, according to blood chemistry analysis. New drug combinations have improved capture efficiency, have allowed for the quick reverse of immobilizing agents and have allowed for speedier recoveries of captured bears after being collared. New measures of body condition have also been investigated to look at population health over time.

Current Global Positioning System (GPS) data has also exposed some interesting grizzly bear association patterns during the mating period. The data confirm that bears continue to find mates, and successfully mate within the study area. This precept was supported by the emergence of many radio collared female bears from their dens with cubs in 2001.

Population
The study area (which has been expanded to 9700 km^2) is currently home to a large number of bears, with approximately 66 to 147 bears roaming the area. Data analysis that highlights sampling biases is underway to address this population estimate. Although imprecise, the current estimated density within the study area appears to be greater than that identified by Dick Russell in Jasper National Park in 1970.

Research has shown that the grizzly bears within the study area continue to find mates, reproduce, gain weight and establish den sites – all very positive indicators for the grizzly bear population. While this is not conclusive evidence that the grizzly bear population has increased over this period, it supports the idea that bears continue to live in the same general areas, year after year.

During the 2002 field season, collaborators from the University of Washington returned with a field crew and trained scat detection dogs. The crew worked in portions of the study area and retrieved more than 500 samples of bear scat for DNA, and stress and reproductive hormone analysis. Laboratory work with the 2001 samples has been completed and the 2002 samples are currently being analyzed.

Habitat Mapping and Remote Sensing

The identification and ability to map grizzly bear habitat within the study region is a key element to this research effort. The remote sensing map products developed have shown an improved ability to predict grizzly bear occurrence over existing mapping products.

In 2002, University of Calgary partners continued developing a grizzly bear habitat map for the expanded study area, using remote sensing tools and field data. Current research also includes the use of new satellite imagery to measure and quantify landscape change and the investigation of links between landscape metrics and bear densities and movements. The ways in which seismic lines and other linear disturbances may influence bear movements area are also being analysed. Exploration of new modelling techniques to predict how bear travel routes may relate to landscape attributes continues.

Resource Selection Function Modelling

Collaborators at the University of Alberta completed the first set of Resource Selection Function Modelling (RSF) models to identify the location of bears within the study area, and to determine the variables related to bear habitat use. These RSF models attempt to incorporate both vegetative characteristics and human factors (roads, mining, forestry and oil and gas activities). Based on location data from 1999, a preliminary model showed a significant level of

individual variation. Some of the early findings also suggest that bears may choose older regenerating cut blocks (22 years or older) over young ones

Mortality

To date, most of the known grizzly bear mortality within the study area has been related to poaching, all of which occurred near open roads within the study area. Five grizzly bears have been legally hunted as part of the regulated bear hunt in this region. Researchers continue to investigate the possible relationship between road densities and habitat use and response by grizzly bears.

Micro-Habitat Selection

In May 2001, research staff began examining bear selection at the micro-site level. The importance of this selection level is two-fold. A clear understanding of why specific broader habitat classes are important to grizzly bears is essential for the effective management and conservation of the species. Analysis at the broader habitat classifications cannot provide this information. Micro-habitat selection also allows for the collection of valuable information pertaining to the grizzly bear's diet – information that is critical to understanding the ecology and behaviour of grizzly bears. To date, four representative female grizzly bears have been selected and fitted with GPS collars, over 700 plots have been completed and 409 scat samples have been collected for diet analysis.

The study team also established five permanent berry (*Shepherdia canadensis)* plots across the study area. This food is an important staple for grizzly bears in the area, providing the necessary fat supplies required to survive the winter denning season. This element of the study aims to uncover the variation of berry production across years and within the study area, and how this variation may relate to broader habitat selection scales and body condition.