



Home range, habitat use, and food habits of black bears in south-central Montana  
by Scott Quentin Greer

A thesis submitted in partial fulfillment of the requirements for the degree of Master of Science in Fish and Wildlife Management

Montana State University

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Abstract:

Black bear (*Ursus americanus*) food habits, home range, movements, and habitat use were studied in the Beartooth Mountains of south-central Montana in 1983 and 1984. Twenty two bears were instrumented with radio transmitters and located aerielly every seven to ten days. Adult males and females had average home range sizes of 163 km<sup>2</sup> and 14 km<sup>2</sup>, respectively. Adult females used areas less than their annual home ranges each season except summer. Adult males appeared to occupy the same amount of area each season. Adult females had significantly smaller home ranges in 1984 than in 1983. Annual home ranges of females appeared to be geographically stable between years. Females were felt to be mutually exclusive of each other, although overlap between home ranges did occur. Adult females recorded their largest average movements in July and August; adult males, subadult males, and subadult females were variable in their movements. Habitat use was determined by 152 adult female relocations. On an annual basis, females preferred habitat types *Picea/Physocarpus malvaceus* and *Abies lasiocarpa/Calamagrostis rubescens* in mosaic with *Abies lasiocarpa/Vaccinium scoparium-Calamagrostis rubescens* and the habitat group forest/mixed shrubs. Nonforest, limber pine/bunch grass, and whitebark pine forests were avoided. Low elevations, areas close to water, and gentle slopes were preferred; high elevations and areas far from water were avoided. All aspects were used in proportion to availability. Graminoids and whitebark pine nuts were of primary importance in the 1983 diet. Berries were the most frequent food item and comprised the greatest percentage of total scat volume in 1984. Forbs, insects, and carrion played minor roles in the diet for both years. Important bear habitat appears to be related to moist areas. Management recommendations are presented.

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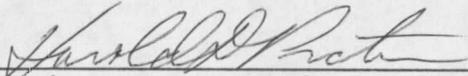
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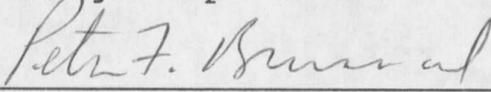
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## ABSTRACT

Black bear (*Ursus americanus*) food habits, home range, movements, and habitat use were studied in the Beartooth Mountains of south-central Montana in 1983 and 1984. Twenty two bears were instrumented with radio transmitters and located aurally every seven to ten days. Adult males and females had average home range sizes of 163 km<sup>2</sup> and 14 km<sup>2</sup>, respectively. Adult females used areas less than their annual home ranges each season except summer. Adult males appeared to occupy the same amount of area each season. Adult females had significantly smaller home ranges in 1984 than in 1983. Annual home ranges of females appeared to be geographically stable between years. Females were felt to be mutually exclusive of each other, although overlap between home ranges did occur. Adult females recorded their largest average movements in July and August; adult males, subadult males, and subadult females were variable in their movements. Habitat use was determined by 152 adult female relocations. On an annual basis, females preferred habitat types *Picea/Physocarpus malvaceus* and *Abies lasiocarpa/Calamagrostis rubescens* in mosaic with *Abies lasiocarpa/Vaccinium scoparium-Calamagrostis rubescens* and the habitat group forest/mixed shrubs. Nonforest, limber pine/bunch grass, and whitebark pine forests were avoided. Low elevations, areas close to water, and gentle slopes were preferred; high elevations and areas far from water were avoided. All aspects were used in proportion to availability. Graminoids and whitebark pine nuts were of primary importance in the 1983 diet. Berries were the most frequent food item and comprised the greatest percentage of total scat volume in 1984. Forbs, insects, and carrion played minor roles in the diet for both years. Important bear habitat appears to be related to moist areas. Management recommendations are presented.

## INTRODUCTION

In 1981, the Montana Department of Fish, Wildlife, and Parks (MDFWP) began a baseline study of big game species in response to proposed platinum-palladium mining in the Beartooth Mountains of south-central Montana. The primary focus of investigation was to assess effects of potential habitat loss and/or modification on wildlife. Black bears (Ursus americanus) were one of three big game species singled out for study. Basic movement, home range, and age structure information of black bears were gathered in 1981 and 1982 (Rosgaard and Simmons 1982).

Timber harvest is a second source of habitat loss/modification. In the area of study, 12 million board feet (MBF) of timber are scheduled to be harvested in the next three years, an increase of 4700% over the preceding 10 years (Carl Davis, U. S. Forest Service (USFS), Big Timber District, pers. commun.). In addition, another 10-14 MBF are proposed for harvest in the next decade.

Added on to the impacts of mining and logging, MDFWP personnel have evidence of over-harvest of the Beartooth Face black bear population (Simmons, Stewart, and Butts 1984). The number of black bear hunters, both statewide and in this area, has increased dramatically in the last 10-15 years, to the point where black bear hunting is now

ranked fourth in the state in terms of hunter recreation-days (Aderhold 1984). This has challenged the MDFWP to set hunting seasons and harvest limits within the capabilities of the resource. For these reasons, MDFWP funded this two year study (1983-1984) of black bears along the Beartooth Face. Data were collected from July to mid-September in 1983 and May through October in 1984.

The main goal of this study was to provide background data on the black bear population in order to assess potential impacts. Specific objectives were to: 1) identify general habitat use patterns of adult female black bears; 2) determine seasonal food habits and how they relate to habitat use; and 3) determine the movements and home range sizes of black bears.

## STUDY AREA

The study area lies along the northern edge of the Beartooth Range of south-central Montana, approximately 32 kilometers (km) south of Big Timber, Montana (Figure 1). The area is administered by the Gallatin and Custer National Forests (GNF and CNF, respectively), with a small portion in private ownership. The western portion of the area (GNF) is drained by the Boulder River, and the eastern portion (CNF) is drained by the Stillwater River.

### Physiography

Topography is quite diverse, ranging from low gradient stream bottoms to high alpine peaks. The southern portion of the study area is dominated by the high elevation East Boulder Plateau. Drainages radiate from the Plateau to the north and west. Elevations range from approximately 1676 meters (m) in valley bottoms to 3094 m atop Chrome Mountain.

The Beartooths were produced during a period of uplift in the late Cretaceous and early Tertiary. On the Beartooth Plateau, Paleozoic and Mesozoic sedimentary rocks have eroded away to reveal Precambrian igneous and metamorphic basement rocks. The sedimentary layer is still intact along the flanks of the Plateau. The present diverse topography of high plateaus, narrow ridges, and

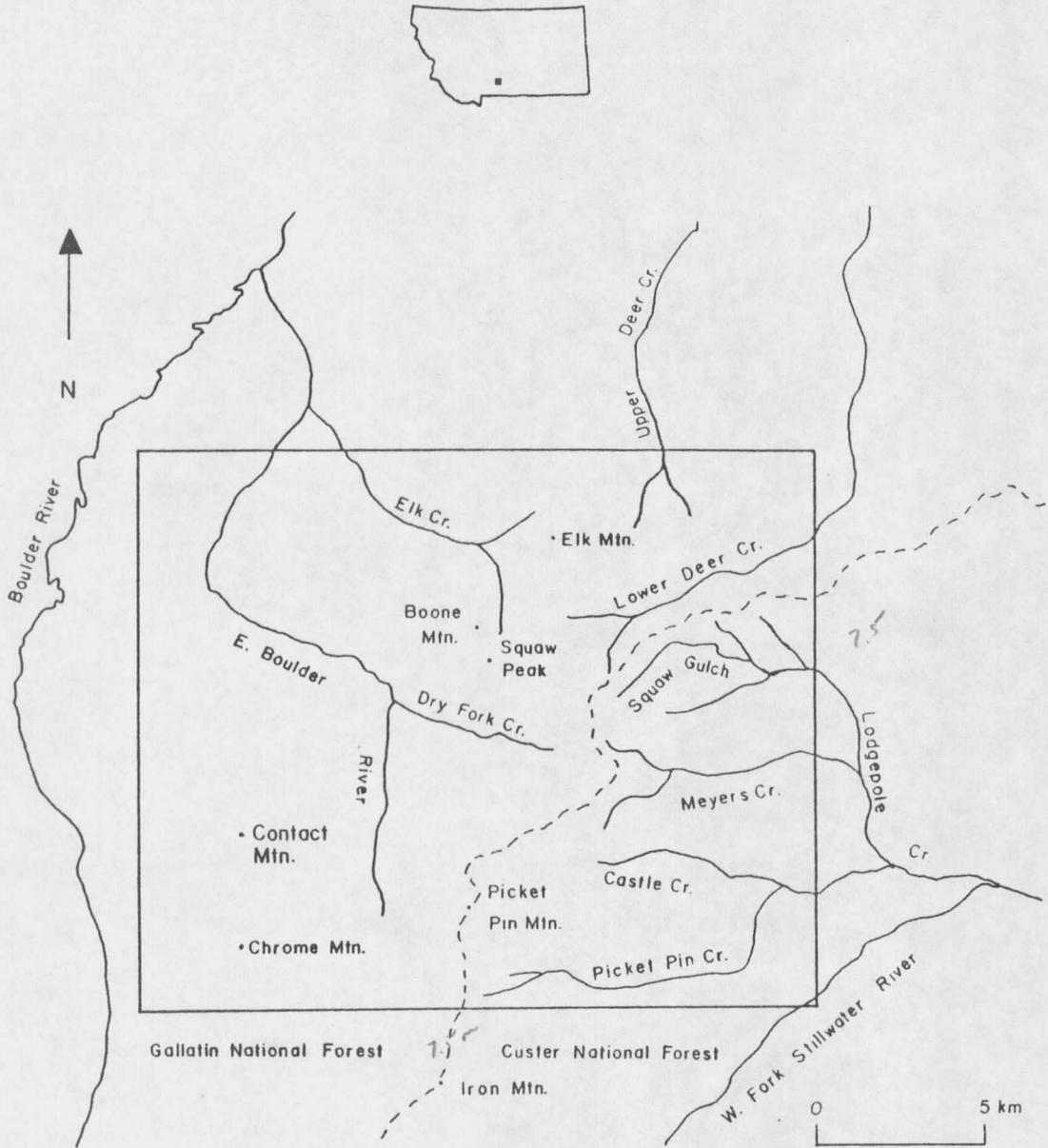


Figure 1. Map of the study area.















































































































































































