

PANEL 1: THE ECOLOGY, POPULATION CHARACTERISTICS, MOVEMENTS AND NATURAL HISTORY OF BEARS

Population Characteristics of the Northern Interior Grizzly in the Yukon Territory, Canada

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INTRODUCTION

The grizzly bear (*Ursus arctos*) is one of the most important big game species in North America. Although its dominant position in the ecosystem continually places it in conflict with man, mortality from sport hunting and nuisance kills cannot be properly evaluated without some information about the natural population dynamics of the species.

In 1964 the Canadian Wildlife Service began research on the ecology of the Northern Interior grizzly bear. This ecotype of grizzly occurs over the interior mountains of northern British Columbia, the Mackenzie Mountains of the Northwest Territories, the Yukon Territory, interior Alaska, and over the arctic tundra of Canada and Alaska.

A study area in the Kluane Game Sanctuary in southwestern Yukon Territory, where grizzly bears are protected from hunting, was established. These grizzlies do not live under coastal conditions and do not depend on anadromous fish runs for annual sustenance.

This paper presents preliminary information on the population dynamics of the grizzly in the study area. Pearson *et al.* (1968) and Choquette *et al.* (1969) have published other aspects of the study.

STUDY AREA

The area of study was approximately 520 square miles centred around the conflux of the Dezadeash and Kaskawulsh Rivers which joint to form the Alsek River flowing 100 miles south to Dry Bay in the Gulf of Alaska. Fourteen miles of road and four miles of navigable river provided our only access into the area. Travel by helicopter was possible, but too expensive to permit intensive coverage.

The elevation ranges from 1,900 feet to 7,600 feet above sea level. Four biotic zones were differentiated:

1. Gravel flood plains

These areas are gravel and mud crossed by river channels. Vegetation, constantly invading the less active fringes of the flood plains, includes a variety of grasses, pea vine (*Hedysarum alpinum*), raspberries (*Rubus* sp.), gooseberries (*Ribes*, sp.), bearberry (*Arctostaphylos wa-ursi*), and, most important

to the grizzlies, soapberry (*Shepherdia canadensis*). The tree cover is spotty and consists mainly of willow (*Salix* sp.). A few balsam poplars (*Populus balsamifera*) and white spruce (*Picea glauca*) also occur.

2. Spruce forest

This zone begins where the valley flats meet the mountain slopes and extends upwards to the 3,000- to 4,000-foot level. Between zones 1 and 2 an inter-gradation zone varies in size according to the steepness of the mountain slope. The forest is composed mainly of white spruce with some stands of willow, balsam poplar, and white poplar (*Populus tremuloides*). Dense thickets of alder (*Alnus* sp.) grow in the moist spots. Various grasses grow on the steeper, drier slopes.

3. Sub-alpine willow

Dense stands of dwarf willows and birch (*Betula glandulosa*) dominate the 4,000- to 6,000-foot levels. Typically alpine flora is found in the moist area of the plateaus; herbaceous species, in the upper limits.

4. Rock and snow

Above the 6,000-foot level, vegetation is sparse although some lichen communities occur. There are extremely steep rock outcroppings and talus slopes, many permanently covered by snow.

TECHNIQUES

The grizzly bears were captured in traps or shot with a tranquilizing drug from a pursuing helicopter. Precoded, coloured flags were attached to the ears of the animals to allow subsequent identification of observed grizzlies. This provided information on movement, reproduction, and mortality. In 1968 and 1969 radio transmitters were attached to bears by neck collars, and subsequent tracking from the ground and air provided more comprehensive data on movements.

RESULT

Reproduction

The litter size is smaller than that recorded in other areas. Thirteen sows had 22 cubs and yearlings. Yearlings were included in the calculation only if the number of cubs originally in the litter was unknown. There was a mean litter size of 1.58 compared with 2.36 for the Kodiak National Wildlife Refuge (Troyer & Hensel 1964); 2.2 for Glacier National Park (Mundy 1963); and 2.19 for the Alaska Peninsula (Lentfer 1966). Most litters had one cub; some had two; and only two litters had three cubs.

The young remain with the sow until late May of the third year when the family unit breaks up. The female then breeds in June. If breeding is successful, there is a three-year breeding cycle. A four-year cycle between litters occurred in two cases when breeding was unsuccessful.

The age of sexual maturity of male grizzly bears in the area was not studied. However, there appeared to be a surplus of large males which ensure breeding

of all receptive females. Erickson *et al.* (1968) observed that male brown bears from coastal Alaska reached sexual maturity at four years.

The age of three females at or near sexual maturity was judged from annular lines in the cementum of the teeth. One animal killed at 6½ years had two corpora lutea of pregnancy in its ovaries. Two other females were seen in the company of males only in June of their sixth year. It would appear that sows first go into oestrus at 6¼ years and have their first litter at seven. Hensel *et al.* (1969) found that grizzly females on the coast commonly reach sexual maturity during their fourth year.

No previous information has been published on the life expectancy of grizzlies. Annuli of teeth of grizzly specimens collected in the Yukon indicate that only a few females live longer than 16-17 years. It is, however, more difficult to judge the age of older animals, and the estimates may be inaccurate.

Mortality

During the five years of the study two adult males wandered from the game sanctuary and were killed by hunters. Probably most adult male grizzly bears are subject to hunting pressure since they wander over much larger areas than do other grizzlies.

One aged male (20+ years) and one sub-adult male (4½ years) were killed by other bears. Two adult males captured alive had large infected wounds that could have been inflicted only by another grizzly.

Of the 14 cubs observed in the study area, 11 survived as yearlings. Of these one died a natural death. Thus, of 14 cubs born 10 were weaned at 2½ years.

Movements

Radio tracking has shown that under normal conditions grizzly females do not go long distances. The mean range of eight sows during 1969 was 27 square miles. And there is some indication that sows follow a traditional route, perhaps learned from the parent. It was not uncommon to find two or three sows with some common physical characteristic making much the same movement pattern.

The boars cover a much greater area—average range over 114 square miles—and it is, therefore, difficult to track them accurately. New untagged males were caught in the study area each year and it is not known from where or how far they came. Most of the wandering was done in August and September when the animals were feeding along the alluvial valley bottoms. 'Homing' probably occurs among boars since some of them were seen or captured, or both, in the intensive area during all five years of the study. Random movement is not likely to produce such results.

Although they do not normally range over great distances, sows can travel quite far when relocated. One grizzly sow transferred 70 miles from its home site, returned to it in three days.

Population structure

Forty-seven different grizzlies were captured and marked on the intensive study area. In addition nine young of marked bears were observed but not tagged. One untagged sow with two young was seen and identified in 1968 and 1969.

In an area of approximately 500 square miles the annual population increase averaged 4.8 animals. This number could be harvested each year without adversely affecting the population of approximately one grizzly per 10 square miles.

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