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## BROWN BEAR HARVEST STATISTICS IN ALASKA

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### Introduction

Alaska has widely distributed populations of brown and grizzly bears which furnish trophies highly desired by many hunters. Bears occur throughout nearly all of Alaska except on the Aleutian Island chain beyond Unimak Island and on the islands south of Frederick Sound in Southeastern Alaska.

In a recent taxonomic study (Rausch 1963) classifies all brown and grizzly bears as Ursus arctos Linnaeus with some sub-specific classifications. Although brown and grizzly bears are considered a single species, differences, mainly in size, do occur. The coastal brown bear is considerably larger than the interior grizzly. It is not known if this is because of genetic or environmental factors or a combination of these. Salmon, generally available to coastal bears, furnish a richer food supply than is available to interior bears. Also, coastal bears spend less time in dens than those in the interior and thus have a greater period of the year in which to feed and grow.

Bears are hunted in various ways. Boats are used in coastal waters and in certain inland lakes for transportation to hunting areas and for spotting bears. Aircraft are used extensively in some areas. Persons interested in game management both from a professional and a lay standpoint at times question the desirability of using airplanes, both from an esthetic standpoint and because planes are quite an efficient means of harvesting bears. Present game regulations allow spotting of game from a plane, but do not allow driving, herding, or molesting. In addition, on the Alaska Peninsula persons using aircraft must fly into a pre-existing camp or establish a camp before shooting a bear. Helicopters may not be used in any way connected with hunting. During the fall a number of bears are taken incidentally by persons hunting for other game. This is particularly true away from the coastal areas where sheep and caribou hunters kill a number of grizzlies. Statewide, about half the bears are taken by non-residents nearly all of whom employ guides. A certain segment of resident hunters also employ guides.

Regulations for management of brown and grizzly bears have generally become more restrictive over the years. The present bag limit is one bear a year; cubs to two years of age and sows with cubs are protected. Hunting is allowed during both the spring and the fall in most parts of the State. Residents need only a general hunting license, and non-residents must purchase a \$75 tag in addition to a \$10 license prior to hunting. Guides are no longer required by non-residents.

One phase of the brown and grizzly bear research and management program has been to attempt to obtain an accurate assessment of the harvest. This is particularly desirable since vast distances and, in some areas, sparse bear populations make direct population assessments difficult. Since 1961 hunters have been required by regulation

to present brown and grizzly bear hides to a Game Department representative within 30 days after taking. At this time the sex, size, and condition of the hide, the location and date of kill, and when possible, the size of skull are recorded. A seal is affixed to the hide to indicate that the sealing regulation has been complied with. Data are tabulated for each of the 26 game management units in the State, and are then lumped into five regions, each of which is a fairly distinct hunting area. For example a brown bear hunter would probably go to either the Alaska Peninsula, Kodiak Island, or Southeastern Alaska, each of which is a separate unit for treatment of harvest data.

#### Characteristics of the Harvest

The Statewide Alaskan sport kill of brown and grizzly bears as indicated by hides presented to Department personnel for sealing has averaged 554 for each of the four years, 1961 through 1964. On a composite basis for the four years the harvest has been divided among areas as follows: Alaska Peninsula, 28 per cent; Kodiak-Afognak, 22 per cent; Interior-Arctic Alaska, 18 per cent; Southcentral Alaska, 16 per cent; and Southeastern Alaska, 16 per cent. During the four years 44 per cent of the kill has been taken during the spring season, and 56 per cent has been taken during the fall season with a marked difference in the geographic distribution of kills between spring and fall seasons. In the spring the Alaska Peninsula and the Kodiak-Afognak area have each furnished about one-third of the harvest and Southeastern Alaska about one-fifth of the harvest. In the fall the Alaska Peninsula, Southcentral Alaska, and Interior-Arctic Alaska have each furnished about one-fourth of the harvest. The trend in total harvest for the four years has been upward. Areas contributing to the increased harvest have been the Alaska Peninsula each year in the fall, the Interior-Arctic region in 1962 and 1963 in both the spring and fall, and Southeastern Alaska in 1964 in the spring. The kill in other areas and seasons has fluctuated or shown only a slight increase from year to year. (Table 1).

The reason for the increase in kill is probably increased hunting pressure rather than greater hunting success. The sale of resident hunting licenses has increased nearly 10 per cent from 1961 to 1964. The number of non-resident brown-grizzly bear tags has gone from 437 in 1961 to 551 in 1964, an increase of 26 per cent. Hunting success as measured by the only method available, success of non-residents buying tags, has fluctuated between 57 and 64 per cent but has not increased from year to year.

The sex ratio of the harvest is obtained by determining the sex of each hide presented for sealing from test size and presence of a penis sheath or vaginal orifice. It is necessary that the hide be examined by Department personnel as guides and hunters sometimes list females as males. Data in Table 1 indicate that the per cent of males, although showing some variation from year to year for various regions, is fairly constant for each region.

Statewide, the per cent of males in the harvest has averaged 75 per cent in the spring 56 per cent in the fall, and 65 per cent for the combined seasons. The greater percentage of males killed in the spring is consistent for all areas. Reasons for the greater total male kill are the protection afforded sows with cubs and selective hunting for larger bears which are males. The male ratio is higher in the spring than in the fall because males emerge from hibernation earlier and therefore are hunted longer

in the spring and because yearling cubs may have left their mothers by fall, thus making these females subject to hunting in the fall.

Hide sizes are obtained at the time of sealing by laying the hide out flat and measuring from the tip of the nose to the anus and from front claw tip to front claw tip across the shoulders.

Data in Table 2 indicate that hide size has remained fairly constant in all areas since 1961 except on Kodiak-Afognak where a decrease in size is shown. Kodiak-Afognak and the Alaska Peninsula are the two areas hunted most heavily and provide the largest bears. The size of Alaska Peninsula bears has not decreased. Bears from Southeastern Alaska have consistently been somewhat smaller than Kodiak and Alaska Peninsula bears. Bears from Interior-Arctic and Southcentral Alaska have been smaller than bears from the other areas.

Skull measurements are obtained whenever possible; however, it is difficult to make meaningful comparisons since sample sizes are small, and samples are biased because hunters present a greater proportion of the larger skulls for measuring.

Most of the spring kill, approximately 80 per cent, occurs in May. About 10 per cent occurs in April and 10 per cent in June. The peak of the Interior-Arctic harvest occurs earlier than that of the rest of the State partly because grizzly bears are hunted by late-season polar bear hunters. The kill in June is mostly from Southeastern Alaska where the season remains open later than throughout the rest of the State. The earliest reported bear kill was on March 18.

During the fall the peak of the kill in Southcentral and Interior Alaska occurs immediately after the season opens in various game management units on either August 20 or September 1. The Southeastern and Alaska Peninsula kill is distributed through September and early October. The season on most of Kodiak opens October 1, and the kill is distributed throughout October. The latest kill reported was on December 31.

Statewide, the harvest is divided nearly equally between residents and non-residents. Non-residents kill slightly more than half the bears taken in the spring and slightly less than half those taken in the fall. On an area basis non-residents kill more than two-thirds of the bears taken on the Alaska Peninsula, about one-half of these taken in both Southcentral Alaska and on Kodiak-Afognak, and about one-third of those taken in Southeastern Alaska and in the Interior-Arctic region.

The incidence of rubbed hides is also determined at the time of sealing. Except for the Interior-Arctic region, the incidence is fairly high in the spring, ranging from 25 per cent on the Alaska Peninsula to 45 per cent in Southeastern Alaska. The incidence increases in the spring as the season progresses. The incidence of rubbed hides is much lower in the fall, ranging from 4 per cent in the Interior-Arctic region to 9 per cent in Southeastern Alaska.

Table 1

Number and Percent of Males of Brown and Grizzly Bears  
Harvested by Sport Hunters in Alaska  
1961-1964

	1961		1962		1963		1964	
	No.	%	No.	%	No.	%	No.	%
<b>Southeastern</b>								
Spring	44	86	49	77	37	77	70	76
Fall	29	44	40	62	41	50	49	63
Total	73	70	89	70	78	63	119	70
<b>Kodiak-Afognak</b>								
Spring	82	72	98	75	79	69	90	58
Fall	36	53	33	55	31	70	28	79
Total	118	66	131	70	110	69	118	63
<b>Alaska Peninsula</b>								
Spring	70	82	100	79	75	83	74	80
Fall	51	61	61	51	88	49	96	59
Total	121	73	161	69	163	64	170	69
<b>Southcentral</b>								
Spring	8	78	3	50	3	75	4	100
Fall	88	44	77	53	91	60	86	57
Total	96	47	80	53	94	60	90	59
<b>Interior-Arctic</b>								
Spring	12	82	15	62	26	54	31	91
Fall	52	58	70	63	93	60	99	57
Total	64	63	85	63	119	59	130	59
<b>Statewide<sup>1/</sup></b>								
Spring	216	79	265	76	221	73	269	91
Fall	257	51	282	57	346	56	358	59
Total	473	64	547	66	567	63	627	65

<sup>1/</sup> Statewide totals include a few bears for which kill areas are unknown.

Table 2

Average Hide Sizes (length plus width in feet) of Brown  
and Grizzly Bears Killed by Sport Hunters in Alaska  
1961-1964

	1961		1962		1963		1964	
	Size	n <sup>1/</sup>	Size	n	Size	n	Size	n
Southeastern								
Male	14.5	48	15.0	57	14.3	40	14.4	75
Female	13.5	21	13.3	24	12.7	23	12.8	33
Kodiak-Afognak								
Male	16.9	75	16.5	90	16.2	74	15.2	74
Female	14.6	39	15.3	39	14.9	33	13.9	39
Alaska Peninsula								
Male	16.4	80	16.4	105	16.1	99	16.2	109
Female	13.8	29	13.4	48	13.2	55	13.5	48
Southcentral								
Male	12.9	42	13.2	42	12.8	56	12.9	49
Female	12.4	47	11.8	37	12.0	37	11.9	37
Interior-Arctic								
Male	12.6	37	12.9	49	12.7	61	13.0	80
Female	11.7	22	11.7	29	11.8	42	11.8	43

<sup>1/</sup>n = number of hides measured

Discussion

Various management actions can be taken as sealing data reveal changes in the harvest from year to year. If the number of bears smaller than what is considered trophy-size increases, the season can be shortened to reduce the harvest and allow more bears to reach trophy-size. It must be realized that when a population is first hunted to any extent, the number of mature males which furnish the largest trophies will decrease.

Sex ratios in the harvest can be affected to a certain extent by changing dates of seasons. The per cent of males in the harvest should increase if the fall season is shortened or if the spring season is closed earlier.

The incidence of rubbed hides could be reduced by lengthening the fall season or shortening the spring season, preferably by closing it earlier.

Kill locations indicate areas which furnish substantial number of bears. This, in conjunction with survey work, could be used to delineate areas which should be dedicated to bears and where types of human activity incompatible with maintenance of bear populations would be held to a minimum.

One disadvantage of the present sealing program is that hide size is the only criteria used to indicate age structure. Hide size is not an entirely satisfactory indicator since bears grow fairly rapidly and a large hide could indicate either a medium aged or an old bear. Also, the size of an individual hide can vary considerably, depending on whether it has been fleshed and/or salted, and how long it has dried before being measured. A more precise measure could probably be obtained if all skulls could be examined. It is hoped that mandatory presentation of skulls for examination can be made part of the sealing requirements.

#### Literature Cited

Rausch, R. L.

1963. Geographic variation in size in North American brown bears, Ursus arctos L., as indicated by condylobasal length. Canadian Journal of Zoology. 41:33-45.