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ALASKA DEPARTMENT OF FISH AND GAME
JUNEAU, ALASKA

STATE OF ALASKA
William A. Egan, Governor

DEPARTMENT OF FISH AND GAME
James W. Brooks, Commissioner

DIVISION OF GAME
Frank Jones, Director

ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES
PART II - CARIBOU, BROWN-GRIZZLY BEAR, SHEEP, MUSKOXEN, MARINE MAMMALS, BISON, GOAT, AND BLACK BEAR

Edited and Compiled by
Donald E. McKnight, Research Chief

Volume III
Federal Aid in Wildlife Restoration
Project W-17-4, Job Nos. 3, 4, 6, 7, 8, 9, 12, 14, 15 & 17

(Printed February, 1973)

MEMORANDUM OF TRANSMITTAL

February 23, 1973

TO: James W. Brooks, Commissioner
Alaska Department of Fish and Game

FROM: Franklin F. Jones, Director
Division of Game
Alaska Department of Fish and Game
Juneau

SUBJECT: Annual Report of Survey-Inventory Activities

In 1969 the Game Division initiated a series of annual reports related specifically to survey and inventory activities conducted by staff biologists each year. Surveys and inventories include all routine data collections directed toward assessment of the status of game populations and toward the determination of annual game harvests. These reports include study results and conclusions and, when applicable, recommended hunting regulation changes.

Because experience has shown that these reports are of interest to citizens unfamiliar with Alaska game management unit boundaries, a map showing these boundaries is included in each report. Information in these reports is organized by game species and management units. This year a brief summary of report contents has been added.

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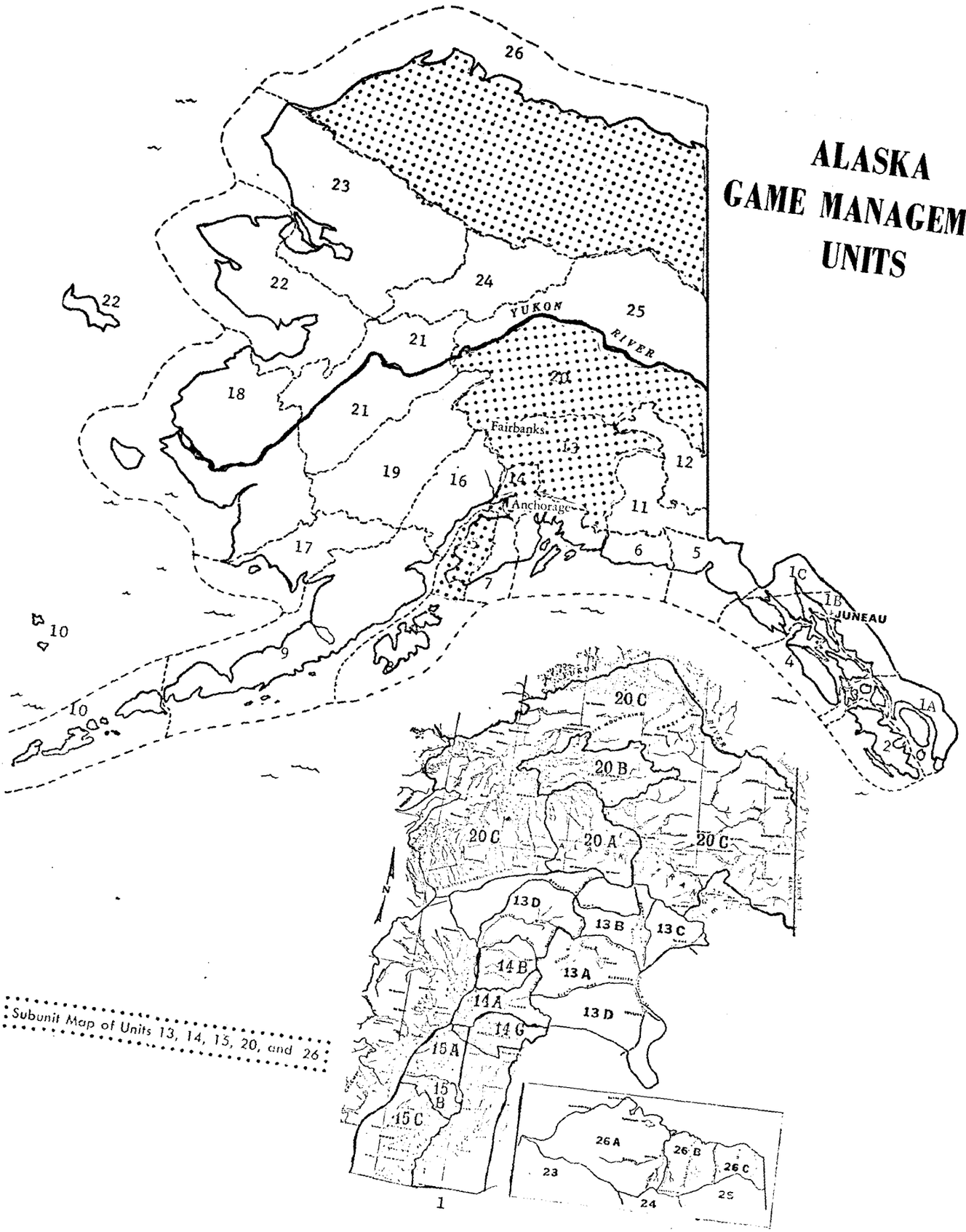
ALASKA GAME MANAGEMENT UNITS



Subunit Map of Units 13, 14, 15, 20, and 26

STATEWIDE HARVESTS AND POPULATION STATUS

Caribou

Extrapolated data from the harvest ticket program show that 13,379 caribou were harvested in Game Management Units 11, 12, 13, 14 and 20 during the 1971-72 hunting season. Statewide harvests by sport and subsistence hunters during this period were estimated to be approximately 30,000 animals.

The transplanted Kenai Peninsula herd has apparently become well established and a limited harvest is recommended. Statewide caribou herds remained stable or showed slight declines.

Brown/Grizzly Bear

The 1971 legal sport harvest of brown/grizzly bears was 732 animals. Game Management Units 8 and 9 (Kodiak and the Alaska Peninsula) contributed nearly one-half of the statewide harvest (302 animals).

Statewide bear populations remained stable or showed slight increases.

Dall Sheep

In 1971 hunters harvested 1,079 Dall sheep in Alaska. This reported harvest was second in magnitude only to the 1968 take of 1,122 sheep.

Statewide sheep populations remained stable.

Other Species

The Nunivak Island muskox population sustained a loss of approximately 56 animals during the 1970-71 winter. Transplanted herds at Nelson Island and the Seward Peninsula appear to be fairly well established.

Hunters harvested 20 bison from the Delta herd in 1971 and a limited harvest is recommended for the previously unhunted Farewell herd.

Populations and harvests of sea lions, sea otters, harbor seals, mountain goats and black bears are reported upon.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 7 and 15 - Kenai Peninsula (Kenai herd)

Seasons and Bag Limits

No open hunting season.

Harvest and Hunting Pressure

No open hunting season.

History

Caribou were extirpated from the Kenai Peninsula in about 1913 as the result of range fires and human activities.

In 1952 the U. S. Fish and Wildlife Service conducted range surveys on the Kenai to determine if areas were available that would again support caribou. Based on this study, and further studies conducted by the Alaska Department of Fish and Game, caribou were reintroduced to the Kenai Peninsula in 1965 and 1966.

On May 2, 1965, 15 caribou (12 cows and 3 bulls) were released at the gas line airstrip adjacent to the Chickaloon River. A supplemental transplant of 29 caribou (26 cows and 3 bulls) was made at Watson Lake on April 24, 1966 (Appendices I & II).

Following these transplants caribou were observed over a wide area of the Kenai Peninsula from Anchor Point to near Hope. By 1969 sightings of wandering caribou had ceased and the animals were established in two discrete groups. One group had established itself in the mountainous area west of the headwaters of Resurrection Creek and the other group was on the muskeg area north and east of the Kenai Municipal Airport and the Moose River Flats.

Composition and Productivity

The number of caribou on the Kenai Peninsula increased greatly between 1969 and 1972. Numerous observations of caribou have been recorded and we now have a good knowledge of caribou abundance, distribution and movements.

Two distinct groups of caribou now exist on the Kenai Peninsula. One group, referred to as the American Pass group, ranges the alpine mountain area west of the headwaters of Resurrection Creek above Wolf Creek on a year-round basis. Movements within this area appear to be random with no preference shown for any part of the area at any season. During the winter these animals group into one or two large herds. Before calving these herds break up into many small scattered bands.

In November 1970 a complete count of the American Pass group was made and 119 animals were counted (Appendix III). In November 1971 a complete count turned up 162 animals, an increase of 36 percent. By projecting known population numbers at the time of the transplant to current known numbers it is apparent that this rate of growth (36 percent per annum) is about equal to the average growth rate over the six-year period. Based on this rate of growth, the 1972 population is projected to be about 220 animals.

The second group of animals, referred to as the Kenai Airport group, inhabits the muskeg area north and east of the Kenai Municipal Airport during the period from about mid-May to late November and the Moose River Flats for most of the remainder of the year. This group remained static in number between 1968, when it first appeared there, and 1971. In 1971 good calf production was noted and the population totaled 27 animals through the winter of 1971-72 (Appendix III).

Management Summary and Conclusions

Two distinct groups of caribou have been established on the Kenai Peninsula as a result of the transplants made in 1965 and 1966.

The American Pass group has grown at an extremely high rate averaging an increase of 36 percent each year. This group numbered 162 in 1971 and is expected to number about 220 in 1972.

The Kenai Airport group grew at a slow rate until at least 1971 when good calf production was noted. This group numbered 27 in 1971 and is projected to number about 32 in 1972.

The original range study conducted in 1952 by the U. S. Fish and Wildlife Service placed the range carrying capacity at about 200 caribou. Although present indications are that the range will support more than this number, steps should be taken toward limiting the growth of this herd.

It is recommended that a hunting season be established to obtain data on the number of hunters and length of seasons needed to control the growth of the mountain herd. It is recommended that the initial season be designed to harvest about 20 caribou on a permit basis.

The airport group of animals should continue to receive complete protection.

Submitted by: Paul A. LeRoux, Game Biologist III and James L. Davis, Game Biologist II

Caribou - GMU 7 & 15 - Kenai Peninsula Herd

Appendix I

KENAI CARIBOU TRANSPLANT - May 2, 1965

Caribou Captured Chistochina Area
Released Pipeline Strip Adjacent to the Chickaloon River

Ear Tag Number					
Right Ear	Left Ear	Sex	Estimated Age	Condition at Release	Remarks
1) 2380	2381	female	adult	fair	pregnant
2) 2384	2385	male	2 years	good	
3) 2377	2376	female	last year calf	good	green plastic in left ear
4) 1176	none	male	adult	fair to good	
5) 2400	none	female	2 years	good	
6) 2396	2398	female	adult	fair to good	
7) 2392	2393	male	adult	poor to fair	large bull
8) 2339	none	female	adult	good	pregnant, orange plastic left ear
9) 1178	none	female	adult	fair	probably pregnant
10) 2386	2387	female	2 years	fair	probably not pregnant
11) 2390	2391	female	adult	good	pregnant
12) 1179	none	female	adult	fair to good	red paint on rump, pregnant
13) 1177	none	female	adult	good	pregnant
14) 1180	none	female	adult	fair to good	pregnant
15) 2399	none	female	2 years	good	not pregnant

Total: Twelve females and three males

Submitted by: Paul LeRoux, Game Biologist III and James Davis, Game Biologist II

Caribou - GMU 7 & 15 - Kenai Peninsula Herd

Appendix II

KENAI CARIBOU TRANSPLANT, APRIL 24 - 28, 1966

Caribou Captured Chistochina Area - Released at Recreation Area on Watson Lake Near Sterling

Tag Number	Age	Sex	Antler Condition	Date Captured	Remarks
1) 4101 left ear	Adult	Female	Antlered	4/24/66	Pregnant
2) 4102 left ear	Adult	Female	Antlered	4/24/66	Pregnant
3) 4103 left ear	Adult	Female	Antlered	4/24/66	Pregnant
4) 4104 left ear	Adult	Female	Antlered	4/24/66	Pregnant
5) 4105 left ear	Calf	Female	Antlerless	4/24/66	(11 months)
6) 4106 left ear	Adult	Female	Antlered	4/24/66	Preg. - Died at release site
7) 4107 left ear	Adult	Female	Antlered	4/24/66	Pregnant
8) 4108 left ear	Adult	Female	Antlered	4/24/66	Pregnant
9) 4109 left ear	Adult	Female	Antlered	4/24/66	Preg. - Died at Gulkana before shipping
10) 4110 left ear	Adult	Female	Antlered	4/24/66	Pregnant
11) 4111 left ear	Yearling	Male	Antlered	4/24/66	(Long yearling) 23 months
12) 4112 left ear	Adult	Female	Antlered	4/25/66	Pregnant
13) 4113 right ear	Yearling	Female	Shed	4/25/66	(Long yearling)
14) 4114 left ear	Yearling	Female	Shed	4/25/66	(Long yearling)
15) 4115 left ear	Calf	Female	Antlerless	4/25/66	
16) 4116 left ear	Calf	Female	Antlerless	4/25/66	
17) 4117 left ear	Adult	Female	Antlerless	4/26/66	
18) 4118 left ear	Adult	Female	Antlerless	4/26/66	Escaped at Chistochina
19) 4119 left ear	Calf	Female	Antlerless	4/27/66	
20) 4120 left ear	Adult	Female	Antlerless	4/27/66	
21) 4121 left ear	Calf	Male	Rt. antler only	4/27/66	Died at Gulkana
22) 4123 left ear	Yearling	Female	Antlerless	4/27/66	
23) 4126 left ear	Adult	Male	Antlerless	4/27/66	Large animal
24) 4127 left ear	Adult	Female	Antlered	4/27/66	Pregnant
25) 4128 left ear	Calf	Male	Rt. antler only	4/27/66	

Numbers 1 through 16 were released on 4/26/66.

Appendix II (cont'd.)

Tag Number	Age	Sex	Antler Condition	Date Captured	Remarks
26) 4129 left ear	Calf	Female	Antlerless	4/27/66	
27) 4130 left ear	Yearling	Female	Antlerless	4/27/66	
28) 4131 left ear	Adult	Female	Antlered	4/27/66	Died at release site
29) 4133 left ear	Yearling	Female	Antlered	4/28/66	
30) 4134 left ear	Yearling	Female	Antlerless	4/28/66	
31) 4135 left ear	Adult	Female	Antlered	4/28/66	Pregnant
32) 4136 left ear	Yearling	Female	Antlerless	4/28/66	
33) 4137 left ear	Adult	Female	Antlerless	4/28/66	
34) 4138 left ear	Calf	Male	Antlered	4/28/66	Died at Gulkana
35) 4139 left ear	Calf	Female	Left antler only	4/28/66	

This latter group released on 4/28/66.

Total: Twenty-six females and three males.

Submitted by: Paul LeRoux, Game Biologist III and James Davis, Game Biologist II

Caribou - Game Management Units 7 & 15 - Kenai Peninsula Herd

Appendix III

Caribou Population Numbers Units 7 and 15

Year	American Pass Group	Airport Group
1965	--	--
1966	--	--
1967	--	--
1968	--	--
1969	--	--
1970	119	--
1971	162	27

Submitted by: Paul LeRoux, Game Biologist III and James Davis, Game Biologist II

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - Wrangell Mountains-Chitina River (Mentasta Herd)

Seasons and Bag Limits

Aug. 10 - March 31 Three caribou

Harvest and Hunting Pressure

Harvest data for the 1970-71 season which were unavailable for the 1971 report are shown in Appendix I. That table also shows comparable data for the 1971-72 season. These data for both years are somewhat misleading since the Nelchina herd spent both winters on the same range with the Mentasta herd, where they were accessible to hunters. The result is that some animals reported and coded as being harvested from the Mentasta herd were actually Nelchina animals and vice versa.

Composition and Productivity

No data on productivity or composition have been gathered during this reporting period for the Mentasta herd (see this section under Game Management Unit 13 - Nelchina herd).

Management Summary and Conclusions

The Mentasta herd has been vulnerable to hunting during the past two winters due to its availability along the Nabesna Road, which was maintained year-round both those years. Heavy use of the Mentasta herd's range has probably resulted from the Nelchina animals' use of the Wrangell Mountains for two successive years, 1970-71 and 1971-72, as their winter range. During most years this herd is unavailable to hunters except to fly-in trophy hunters so the harvest has been minimal. Some egress from this area with Mentasta caribou accompanying Nelchina caribou is a distinct possibility. Although recent population estimates are not available, Lentfer estimated the Mentasta caribou herd numbered 5,000 animals in 1965.

Recommendations

The season for Unit 11 should be shortened to end on September 20 and the bag limit reduced to one animal. This reduction is necessary to protect those Nelchina caribou that winter in the Wrangell Mountains, as well as the Mentasta herd. A September 20 closure will eliminate all criticism that has been directed toward the use of snow machines for hunting these caribou.

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 11 - Wrangell Mountains-Chitina River

APPENDIX I

Harvest statistics Mentasta caribou herd, GMU 11, 12 and 13. Data derived from harvest ticket returns.

	1970-71	1971-72
Total number of successful Mentasta caribou hunters as reported by harvest ticket returns	491	966
Total number of unsuccessful Mentasta caribou hunters as reported by harvest ticket returns	118	457
Total number of successful and unsuccessful Mentasta caribou hunters as reported by harvest ticket returns	609	1423
Harvest of males	519	742
Percent of males	61.3	43.8
Harvest of females	317	917
Percent of females	37.4	54.1
Harvest of sex unknown	10	34
Percent of sex unknown	1.1	2.0
Total reported caribou harvest from IBM returns	846	1693
Total caribou harvest as calculated by Hemming's extrapolation formula	1317	2006
Average caribou per hunter as calculated by Hemming's extrapolation formula	1.39	1.19

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 11, 12 and 13 (Mentasta Herd)

Seasons and Bag Limits

Aug. 10 - March 31 Three caribou

Harvest and Hunting Pressure

Harvest ticket data indicate that 1,693 caribou were taken from the Mentasta herd during the 1971-72 season. The estimated kill was 2,006 caribou. During the 1970-71 season the reported harvest was 846 and the extrapolated kill was 1,317. Because portions of the Fortymile and Nelchina herds were also harvested in the same vicinity as the Mentasta herd, the 1971-72 harvest from the Mentasta herd is probably inflated. Most of the 1971-72 harvest occurred after October when animals were on the wintering grounds. The chronology of the kill is as follows:

Month	No. Killed*	% of Kill
August	54	4.1
September	55	4.1
October	24	1.8
November	300	22.6
December	165	12.4
January	129	9.7
February	197	14.8
March	405	30.5

*No harvest dates were reported for 364 caribou taken from the range of the Mentasta herd, these animals are not included here, hence this total does not equal total reported harvest.

Hunter distribution of success is as follows:

Killed None		Killed One		Killed Two		Killed Three	
No.	%	No.	%	No.	%	No.	%
457	32.1	474	33.3	257	18.0	235	16.5

Composition and Productivity

No data.

Management Summary and Recommendations

Little is known about the Mentasta caribou herd regarding range, distribution, population status, sex and age composition, productivity, migration routes, etc. Before the Department can begin to manage the herd in a meaningful manner, we must learn more about it. The population has been variously estimated at 2,000-5,000 head. If this were so, the reported harvest of 1,693 animals (or extrapolated harvest of 2,006) must be considered excessive. The harvest figures are largely meaningless, however, because an unknown number of animals from the Fortymile and Nabesna herds were included in the Mentasta harvest.

Increased restrictions governing seasons and bag limits on the Nelchina herd will direct more hunter effort toward the Mentasta herd, especially now that the Nabesna Road is maintained throughout the winter. The Department must gather more factual information on this caribou herd and closely monitor actual harvest levels to assess the effect of hunting on the herd. Considering the probability of a substantial increase in hunting pressure on the Mentasta herd I recommend the bag limit be reduced from three to one caribou per season.

Submitted by: Larry B. Jennings, Game Biologist III

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 12, 20 and Yukon Territory, Canada (Fortymile Herd)

Seasons and Bag Limits

Aug. 10 - March 31	Three caribou

Harvest and Hunting Pressure

The reported kill from the Fortymile herd for the 1971-72 season was 1,994 animals. The extrapolated kill was 2,362, an increase of about 1,000 over the 1970-71 season.

Caribou became available along part of the Taylor Highway during the second week in October, 1971, and continued migrating across the highway in fairly large numbers throughout October. An estimated 10,000-12,000 animals were involved in this migration, most of the Fortymile herd. Considerable hunting pressure was noted on the Taylor Highway during 1971, probably due to several reasons: 1) the publicity accorded the migration by various news media; 2) these were the first caribou to become available in large numbers during 1971 on any of Alaska's road systems; and 3) the October caribou closure in Unit 13 diverted some pressure to the Taylor Highway. Mild weather and good highway driving conditions during this period may have also had an affect. Some 2,126 caribou hunters reported hunting the Taylor and Steese highways during 1971. The average take was 1.1 caribou per hunter. During the 1970-71 season 316 caribou were reported taken from the Steese Highway while in the 1971-72 season only 179 animals were taken there.

An aerial reconnaisance flight at noon Sunday, October 17, 1971, disclosed 220 vehicles on the Taylor Highway, 97 percent between mile 0 and mile 105. Most vehicles were noted between mile 75 and 105, the area in which most caribou were available. Hunter congestion was high. The majority of the kill also occurred between 75 and 105 mile. In contrast to past years, virtually no caribou crossed at American Summit in the vicinity of 140 mile.

Because of light snow cover during this period, relatively few hunters utilized snow machines for hunting purposes. This resulted in increased hunter congestion along the road and possibly contributed a larger unretrieved kill. The inability to operate snowmachines may have increased the difficulty in retrieving animals shot away from the road, especially when more than one animal was shot.

The following table depicts the reported and extrapolated kill since 1968, when the caribou harvest ticket program was first initiated.

Year	Reported Harvest	Extrapolated Harvest
1968	579	-
1969	342	492
1970	889	1386
1971	1994	2362

Harvest ticket data indicated that 53 percent of the 1971 harvest was bulls, 45 percent cows and 2 percent unknown. These figures should be questioned, however, since experience has shown that some hunters are not always aware of the sex of their animal even after field dressing it, and some hunters report taking bulls when they actually took cows due to the stigma attached to shooting females. Distribution of success among hunters is as follows:

	Killed None		Killed One		Killed Two		Killed Three	
Year	No.	%	No.	%	No.	%	No.	%
1969	335	64.9	72	13.9	57	11.0	52	10.0
1970	328	39.7	234	28.3	134	16.2	129	15.6
1971	737	40.5	463	25.4	326	17.9	293	16.1

Composition and Productivity

Sex and age composition counts were not conducted during 1970 or 1971. A post-calving concentration of about 5,000 caribou was found in the upper Salcha River in the vicinity of Little Windy Gulch during June, 1971, but forest fire smoke and dense timber surrounding the migrating animals precluded a photo census. No other post-calving concentrations were located despite several attempts to find animals in areas including the Mt. Harper vicinity, a known calving area during past years.

Teeth (incisors) were collected from 148 animals shot along the Taylor Highway during the 1970 season. The caribou were aged by sectioning the first incisor and enumerating the cementum layers using ultraviolet fluorescence. The age composition of the 1970 harvest is listed below.

Age Class (years)	Male	Female	Sex Unknown	Total	(%)
1	3	3	3	9	(7)
2	5	5	3	13	(10)
3	5	3	2	10	(8)
4	7	8	0	15	(12)
5	13	6	4	23	(18)
6	6	3	4	13	(10)
7	2	7	0	9	(7)
8	3	9	4	16	(12)
9	2	5	3	10	(8)
10	0	6	1	7	(5)
11	0	2	0	2	(2)
12	0	0	0	0	(0)
13	0	1	0	1	(1)

Management Summary and Recommendations

Since 1968 the extrapolated harvest from the Fortymile caribou herd has varied from 492 animals during 1969 to 2362 in 1971. Availability of the caribou along the road systems largly dictates the magnitude of the harvest; when the animals do not cross a road system, little harvest occurs. Caribou crossed the Taylor Highway in large numbers in both 1970 and 1971 and a substantial harvest occurred. The number of caribou hunters who reported hunting from the Taylor Highway has increased; 2126 hunters reported hunting the Fortymile herd in 1971 compared with 1275 in 1970 and even fewer prior to 1970. The October closure in Unit 13 probably directed hunting pressure to the Taylor in 1971. In addition, few caribou have been available along the Steese Highway for a number of years, thus tending to divert some hunting pressure to the Taylor Highway.

The increase in hunting pressure has also corresponded to an increase in aesthetically displeasing hunter performance. Caribou hunting is beginning to carry with it the connotation of slaughter, littered roadsides, harrassment by snow machines, waste, disregard for other hunters and most of all, lack of sportsmanship. This situation is partly brought about by the increase in numbers of hunters, resulting in more direct competition for the available animals. The advent of snow machines has partly alleviated the roadside "firing lines", but snow machines have also brought with them some problems of their own.

There is some indication that the 1971-72 harvest may be larger than desirable. While we have no concrete production or population figures, it is believed that the Fortymile herd does not exceed 15,000 animals. Available data from other caribou herds indicate that annual sustained losses of between 10 and 15 percent is about the maximum that can be withstood without exceeding the annual increment. Based on these

figures, the extropolated kill of 2,300+ animals is probably excessive and this magnitude of harvest cannot be sustained. In addition, the harvest figures do not take into consideration a crippling loss which may be 10-30 percent of the reported kill. The following recommendations are made for the Fortymile herd: (1) the hunter harvest should not exceed 1,500 animals until data indicate that a larger kill can be safely maintained; 2) a check station should be operated continuously on the Taylor Highway while the migration across the highway is in progress to monitor the harvest, collect specimens and provide hunter information; 3) an effective prevention and law enforcement program should be initiated; 4) reduce the bag limit to one animal to more evenly distribute the harvest among hunters, provide recreation opportunities for more hunters, reduce crippling losses and unretrieved kills, and reduce competition among hunters, i.e. presumably hunters would need to spend less time occupying hunting space along the highway to fill bag limits; and 5) initiate range and other studies to determine the reasons for the population decline experienced during recent years and to determine the carrying capacity of the range, production and mortality.

Submitted by: Larry B. Jennings, Game Biologist III

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 13 - Nelchina Basin (Nelchina herd)

Seasons and Bag Limits

Aug. 10 - March 31 Three caribou

Harvest and Hunting Pressure

Harvest data for the regulatory years 1968-69 through 1971-72, the period during which harvest tickets have been mandatory, are summarized in Appendix I. In 1970-71, the Nelchina herd was not generally available to road-based hunters. In 1971-72, the Nelchina animals were available to road-based hunters from about mid-September through the remainder of the season. As a result, a large harvest occurred. Large harvests occurred north of Eureka, along the Lake Louise road, along the Glenn Highway between Eureka and Glennallen, and from Glennallen north to Sourdough along the Richardson Highway. In addition, the Nebasna Road in Game Management Unit 11 was maintained all winter and many caribou were taken there. Hunters using the Denali Highway early in the season had the poorest hunting recorded from there, mainly because the animals were never close to that highway in significant numbers.

Analyses of harvest ticket returns show that the largest percentage of the harvest has occurred during the October-December period, with November generally showing the largest monthly kill. The March harvest is also usually quite high. Harvest chronologies for the past three years are shown in Appendix II. The March figures for 1971-72 are somewhat misleading since most of the kill occurred along the Nabesna Road; those kills were coded to the Mentasta herd. During the past two hunting seasons, hunters utilizing snow machines have accounted for 31.7 and 35.6 percent, respectively, of the reported harvest. Highway vehicles ("afoot") and aircraft are the other major means of conveyance utilized by successful hunters. These two methods of transportation accounted for 75.5 and 84.1 percent of the kill in 1970-71 and 1971-72, respectively. For both of those years, nearly 30 percent of all reporting hunters reported taking two or more caribou.

Historical Denali check station records are shown in Appendix III. Historical harvests from the Nelchina herd are shown in Appendix IV. These data show that the number of Denali caribou hunters has remained fairly constant but that the harvest has been highly variable, being a function of caribou availability. Hunter success in general has shown a steady decline, especially in the Denali Highway area.

The 1971-72 season was only the second on record in which the harvest of female caribou exceeded that of males.

Composition and Productivity

The Nelchina caribou utilized the area south of Lake Louise for rutting in 1971. Because of the timber it was necessary to conduct sex and age composition counts from the air using a helicopter. As a result, yearling animals could not be identified. The spring 1972 sex and age composition counts were conducted in the Nabesna area where the Nelchina herd overwintered. The data collected during those counts are shown in Appendix V, which also provides similar data collected in the fall of 1969 and spring of 1970. The 1971-72 data indicate that there were severe overwinter losses in the calf segment of the herd (50 percent). These losses are presumably due to the very harsh winter of 1971-72. Apparent overwinter reduction in the bull:cow ratios may be the result of disproportionate winter losses of bulls or possible segregation of sexes in late winter.

Age analyses of caribou harvested by hunters during the 1970-71 and 1971-72 seasons are given in Appendix VI. Historical data are presented in Fig. 1 and Appendix VIII.

Blood serum specimens were collected from 87 caribou during the 1971-72 hunting season. Only one of those specimens showed positive reaction to *Brucella abortus*, and that showed only a minimum serological response.

Movements of the Nelchina caribou have been closely monitored for many years. During this report period, the Nelchina herd calved on their traditional Talkeetna Mountains calving grounds. Immediately after completion of calving in 1971, most of the calving segment crossed the Big Susitna River at least four times, which could possibly have contributed to calf mortality. By mid-July the calving segment was still together and had moved to the Butte Lake area. Later the animals dispersed for the summer. In early September they began congregating and migrating toward the area south of Lake Louise, where they rutted. Most animals then slowly drifted easterly and overwintered in the Nabesna area. A small group of animals wintered in the area north of Eureka. The animals that wintered in the Nabesna area began migrating toward their calving grounds in early April. Deep snow accumulation hindered early movement attempts. They arrived on the Talkeetna Mountains calving grounds in late May, 1972.

Population estimates of Nelchina caribou have been made for many years (Appendix VII). The two most recent estimates were made utilizing an aerial photo extrapolation technique. Inclement weather and/or unsatisfactory caribou grouping prevented an aerial photocensus during the 1971 calving concentration. Data collected during the 1972 calving season have not yet been fully tabulated but it appears that the total population is less than 10,000 animals, a drastic reduction from the 1962 estimated of 71,000. These data show that caribou herds can and do undergo severe population fluctuations.

Management Summary and Conclusions

The Nelchina herd is perhaps the most important and widely known caribou herd in Alaska. It has furnished hunting opportunity a day's drive or less by automobile from Alaska's two major cities, Anchorage and Fairbanks, plus many smaller communities as well as five military bases. This herd has provided hunting opportunity for trophy purposes, meat hunting purposes for the average citizen and so-called subsistence purposes for many people. The area inhabited by Nelchina caribou is relatively accessible to most means of conveyance; therefore, these caribou have been hunted with cars, airplanes, snow machines, dog teams, various all-terrain vehicles, on foot, horseback and probably other means. The range of the Nelchina herd is dissected by the Denali Highway, the Glenn Highway, the Richardson Highway, the Slana-Tok Cutoff, the Nabesna Road, the Anchorage-Fairbanks Highway as well as many all-terrain vehicle trails. Dirt airstrips are numerous as are ridge tops and river bars, all of which are utilized by aircraft operators. The area is dotted with lakes which are used for float plane operations. Hunters using ski-equipped aircraft and snow machines have had unlimited opportunity in their pursuits. Most of the area is accessible by all-terrain vehicles. Thus, hunting or harrassment through nearly year-round contact with humans, including an eight-month hunting season, have become a part of this herd's environment. Typically, when caribou become available to the average hunter they are in winter concentrations. This condition attracts and concentrates hunters. Such a situation seems to bring out the worst in hunters and tends to devaluate their opinion of the caribou as a game animal. Much abuse of the caribou resource as well as the Constitutional privilege of hunting has resulted. These abuses and illegal acts include a suspected high loss of unretrieved cripples; abandoned animals; herd shooting; exceeding the bag limit; garbage and animal remains left visible along the roadside; destruction of public and private property; indiscriminate shooting, particularly road signs; shooting to, from, or across public roads; driving, herding, and molesting with motorized vehicles, to name a few. These situations further amplify the overall groundswell of antihunting sentiment and perhaps have had a detrimental effect on some aspects of caribou biology. On the other hand, countless thousands of man-days of pleasurable recreational pursuit and a total estimated harvest of 100,000 caribou since 1946 have also been realized. The total effect of this human activity on the Nelchina caribou herd is not known.

Range studies conducted by this Department since about 1955 have shown a steady decrease in the amount of available lichens. This downward trend has been largely attributed to the high Nelchina caribou populations of the late 1950's and early 1960's. Long-term drying conditions the area is now experiencing might also have an effect on lichen production.

The effects of predation are not fully understood. There is ample evidence that wolves and grizzly bears are now reasonably abundant over much of the range of the Nelchina caribou. It is suspected that high predatory animal populations coinciding with low prey populations can

have a further depressing effect on the number of that prey species.

Composition and productivity surveys in recent years have generally shown reduced recruitment of young animals. This is supported by the age analysis of female animals killed by hunters (Fig. 1 and Appendix VIII) which shows an increase in the overall age structure in spite of heavy harvests. It is also shown, of course, in direct counts; 1972, for instance, showed a very low number of calves in March, accounting for only 11.3 percent of the sampled animals. The effect of hunting is evidenced on the bull segment also. The age of the bulls in the harvest is low and has been decreasing for some time. Casual observations indicate the percentage of large-antlered males is low. The effect of the disproportionate harvest in favor of bulls is also shown in sex and age data.

Thus, it appears that poor range, probable egress from the area, poor recruitment of young animals, hunting and predation have resulted in a decrease in the Nelchina population on the order of 86 percent during the last 10 years. It is now possible that natural losses are equal to or even exceed recruitment. Since hunting is the only major factor over which we have any control, it seems logical that hunting seasons and bag limits should be sharply reduced.

Recommendations

Until the current population reduction is more fully understood and the herd becomes stabilized, a very conservative approach is indicated. Records show that the general unavailability of caribou to the masses of hunters prior to October has normally resulted in an early season kill of less than 500 animals annually. Complete cessation of hunting, though perhaps warranted biologically, is probably not desirable because of the consequent difficulty of liberalizing hunting when it becomes desirable. Therefore it is recommended that the hunting season for the area occupied by the Nelchina caribou (Game Management Units 11, 13 and 14) be from August 10 through September 20, and the bag limit be reduced to one animal. Further, the movements of the caribou should be carefully monitored so that if the animals should become accessible to large numbers of hunters during the August-September season or if they should migrate to Game Management Unit 12, the season can be closed by emergency announcement. Termination of the season in September will effectively eliminate all criticism, valid or otherwise, that has been leveled against the use of snow machines in hunting Nelchina caribou.

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

Appendix I. Caribou harvest - Nelchina herd, since inception of harvest ticket requirements.

Regulatory year	MM	%	FF	%	UK	%	Total Reported[1]	Total Calculated[2]	Persons reporting 2 or more caribou	Average caribou/ hunter calculated[2]	Total persons reporting hunting Nelchina caribou[3]
1968-69	--	--	--	--	--	--	4670	--	-- --	--	--
1969-70	2627	48.5	2705	49.9	90	1.7	5422	7814.0	1560 (30.0%)	1.05	5183
1970-71[4]	2538	61.8	1480	36.0	88	2.1	4106	6398.7	1075 (29.0%)	1.11	3710
1971-72	3143	45.8	3600	52.5	114	1.6	6857	8125.1	2013 (28.9%)	0.98	6967

[1]Total reported from IBM returns.

[2]Calculated harvest following Hemming's extrapolation formula.

[3]Game Management Units 13, 14, 20 (both successful and unsuccessful hunters as reported by harvest ticket returns).

[4]Season closed during October, 1970.

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX II

Harvest Chronology - Nelchina Caribou

Month	Percentage of Kill		
	1969-70	1970-71*	1971-72
August	14.9	17.8	8.8
September	12.5	18.4	10.1
October	3.6	1.6	13.7
November	19.4	32.0	42.0
December	12.1	4.6	8.3
January	4.9	2.4	4.8
February	11.0	5.6	7.8
March	21.7	17.6	4.5

*Caribou season was closed in Units 11 and 13, the complete month of October, 1970. All harvested caribou in October were reported taken from Unit 13.

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX III

Denali Highway Check Station Data

Year	No. of hunters checked	No. of caribou checked	Caribou per hunter
1960	3813	1974	.52
1961	3694	2612	.71
1962	5410	2459	.45
1963	4773	2242	.47
1964	5052	1845	.37
1965	3088	1222	.40
1966	2799	857	.31
1967	2977	740	.25
1968	3238	1019	.32
1969	4029	1067	.26
1970	2176	509	.23
1971	3147	447	.14

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX IV. Historical caribou harvest, seasons and bag limits - Nelchina herd.

Year	Estimated Harvest	Percent males sample size in parentheses	Season	Bag Limit
1946	200	Unk.	Aug. 20 - Sept. 30 Dec. 1 - Dec. 15	(Resident - 2 caribou) (Nonresident - 1 caribou) except calves
1947	200	Unk.	(Same)	(Same)
1948	300	97 (175)	Aug. 10 - Sept. 30 Dec. 1 - Dec. 15	(Resident - 2 caribou) (Nonresident - 1 caribou) except calves
1949	400	Unk.	(Same)	1 caribou except calves
1950	500	Unk.	(Same)	(Same)
1951	525	Unk.	(Same)	(Same)
1952	450	93 (291)	(Same)	1 branch-antlered male only
1953	700	85 (445)	(Same)	(Same)
1954	2000	72 (1271)	Aug. 10 - Sept. 30 Nov. 20 - Nov. 30	1 caribou except calves
1955	4000	73 (1067)	(Same)	2 caribou
1956	3500	72 (844)	Aug. 10 - Dec. 31	2 caribou
1957	2500	75 (1125)	(Same)	3 caribou
1958	3500	Unk.	(Same)	3 caribou
1959	4000	70 (922)	(Same)	3 caribou
1960	5500	66 (2535)	(Same)	3 caribou
1961	8000	58 (3923)	(Same)	3 caribou
1962	3500	69 (2640)	(Same)	3 caribou
1963	6300	61 (3709)	Aug. 10 - March 31	3 caribou
1964	8000	66 (1850)	(Same)	4 caribou
1965	7100	67 (1222)	(Same)	3 caribou
1966	5500	71 (849)	(Same)	3 caribou
1967	4000	65 (740)	(Same)	3 caribou
1968	6000	60 (1019)	(Same)	3 caribou
1969	7800	49 (5332)	(Same)	3 caribou
1970	6400	63 (4018)	Aug. 10 - Sept. 30 Nov. 1 - March 31	3 caribou
1971	8125	47 (6743)	Aug. 10 - March 31	3 caribou

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX V

Sex and Age Composition - Nelchina Herd

Date	Total MM/100FF	Calves/ 100FF	Sample Size
October 1969	21.0	39.0	3007
April 1970	21.9	29.2	3388
October 1970		Z E R O D A T A	
April 1971	32.9	33.6	3446
October 1971	33.7	30.2	3540
March 1972	22.0	15.5	1761

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX VI

Age analysis of hunter-killed caribou--Nelchina herd. Ages determined by annuli counts of middle incisor teeth under ultraviolet light. Age analysis performed by Charles Lucier in the Anchorage lab.

1970-71		Year Age	1971-72	
MM	FF	Class	MM	FF
9	2	Calf	50	42
16	11	1	32	27
41	30	2	60	74
49	35	3	106	75
25	12	4	36	66
19	9	5	21	35
14	10	6	15	32
12	15	7	5	27
9	16	8	10	31
2	14	9	5	37
3	12	10	3	37
3	6	11	3	21
-	3	12	2	11
-	4	13	-	9
1	1	14	-	10
-	1	15	-	1
-	2	16	-	-
-	-	17	1	1
N=203	N=183		N=349	N=536
Total = 386			Total = 885	

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX VII

Population Estimates - Nelchina Herd

Year of Estimate	Estimated adult population	Source
1945	10,000	Skoog, 1959
1948	5,000	Nelson, et al, 1950
1955	40,000	Watson & Scott, 1956
1960	64,000	Skoog, 1968
1962	71,000	Siniff & Skoog, 1964
1965	58,000	Assumed by Bos, 1972
1967	48,000	Hemming & Glenn, 1968
1972	10,000	ADF&G raw data

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU - GMU 13 - Nelchina Basin

APPENDIX VIII

Average Age of Nelchina Caribou in the Harvest, 1963-1971

Year	Males Ave. age (years)	N	Females Ave. age (years)	N
1963-64	3.7	357	4.1	191
1964-65	3.6	331	4.2	187
1965-66	4.3	195	3.8	116
1966-67	4.7	166	4.5	65
1967-68	-	-	-	-
1968-69	4.1	125	5.0	104
1969-70	4.3	218	4.6	196
1970-71	4.0	194	5.7	181
1971-72	3.6	299	5.7	494

NOTE: Excludes calves.

Submitted by: Loyal Johnson, Game Biologist III

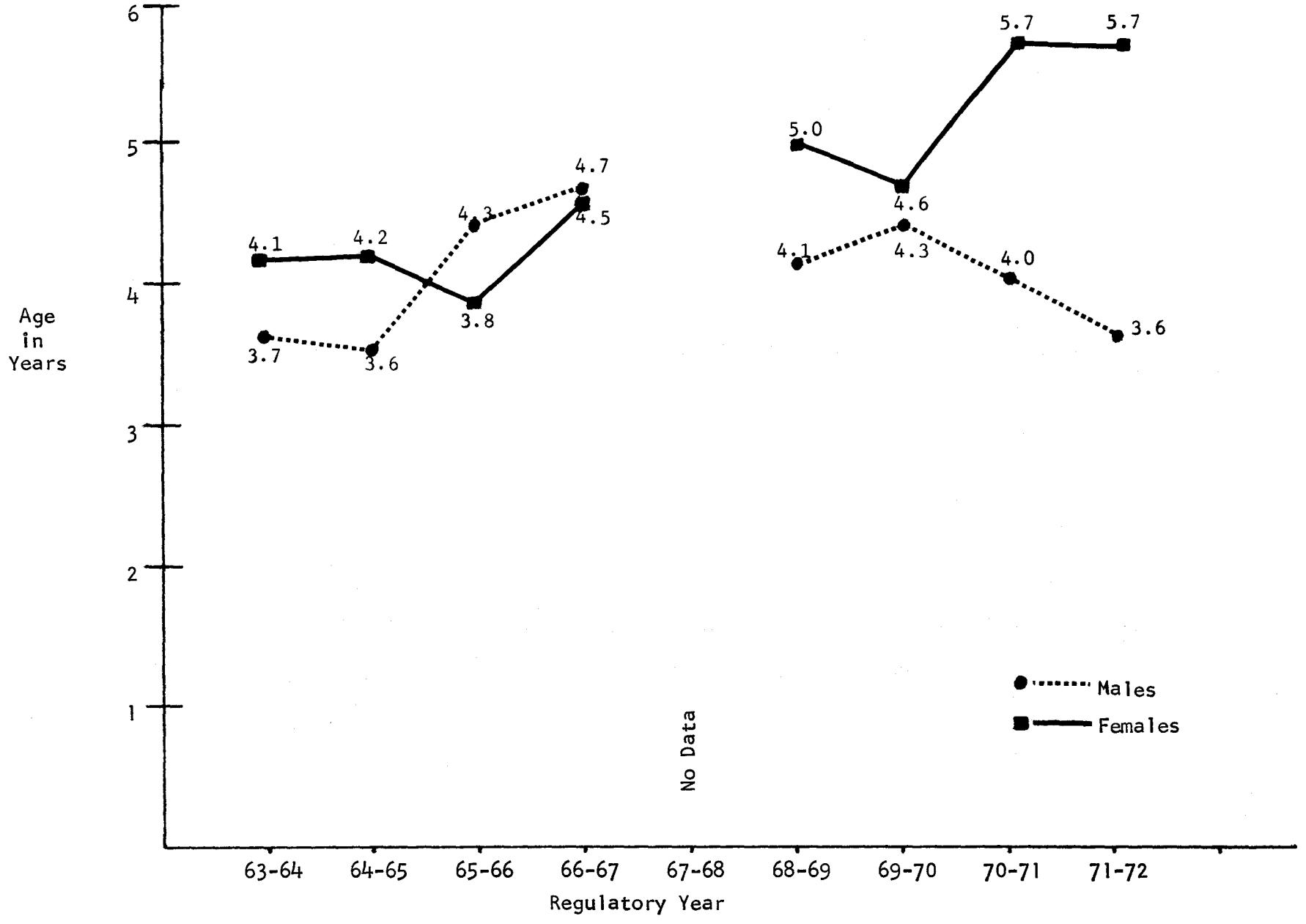


Figure 1. Mean ages of Nelchina caribou exclusive of calves harvested by hunters.

Submitted by: Loyal Johnson, Game Biologist III

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 18, 19, 21 (Including a portion of the Mulchatna herd, the Beaver Mountains herd, other groups found in the Kuskokwim Mountains and the north slope of the Alaska Range)

Seasons and Bag Limits

The portions of Units 18 & 21 south of the Yukon River, and Unit 19	Aug. 10 - March 31	Five caribou
The portions of Units 18 & 21 north of the Yukon River	No closed season	No Limit

Mulchatna and Beaver Mountains Herd

Harvest and Hunting Pressure

Hunting activity in Unit 18 and western Unit 19 (western Kuskokwim Mountains, Kilbuck Mountains, Holitna River-Stony River area) continues to be sporadic. Actual harvest is unknown but negligible. Caribou are generally inaccessible early in the summer. Wintering groups appear to be small and widely scattered, accessible only by aircraft or extended ground trips.

Composition, Productivity and Distribution

No composition-productivity surveys have been made in this area. Distribution is summarized below.

Scattered small bands have been seen in July and August north of Tikchik Lakes, between the upper Aniak River and Kogrukluk River-this may be part of the Mulchatna herd.

Further east, a small band reportedly stays year-round in the Taylor Mountain area, upper Holitna drainage (Nixie Mellick, Sleetmute viva voce). Single bulls have been seen in July and August at Kashegelok and Caribou's on the Holitna River. Some 200 to 300 caribou spend the early winter in a range of low hills west and slightly north of Tundra Lake, between the Hoholitna River and Stony River. On February 26, 1971, I found a band of 40 to 50 near Tundra Lake. On February 25, 1971 I found no sign of caribou on the upper Mulchatna and Nushagak rivers, although Nixie Mellick at Sleetmute said a few bands usually winter in that area. Another favored wintering area for small bands of caribou is between the Cheeneetnuk River and the Tatlawiksuk River. It seems likely that all of these caribou are part of the Mulchatna herd.

North of the Kuskokwim River, scattered bands are present in the areas around upper Crooked Creek, George River, and east to the Takotna River. Their distribution is quite variable, and I do not know if they are part of the group calving in the Beaver Mountains, but it seems likely. One band of 35 was seen October 18, 1970, about 10 miles northeast of Lookout Mountain and two or three were killed near DeCourcy Mountain in early 1971 by aircraft-equipped hunters.

Beaver Mountains Herd

Harvest and Hunting Pressure

Hunting pressure on the Beaver Mountains herd (Unit 19 and 21) was negligible. No kills are known for that area in fall, 1971. Some harvest may have occurred in wintering areas on the Innoko-Iditarod River Flats.

Composition, Productivity and Distribution

No surveys of the Beaver Mountains herd were made in 1971. About 200 caribou had moved into the northwest part of the Beaver Mountains by the last week of February. Trails seen from the air in March indicated movements of animals up the Dishna drainage and Tolstoi Creek.

Kuskokwim Mountains Group (Cloudy-Sunshine Mountains, Nixon Flats, Unit 19)

Harvest and Hunting Pressure

Hunting pressure on the Nixon herd was light and limited to aircraft-equipped hunters from McGrath. About six were taken on the Nixon Flats.

Composition, Productivity and Distribution

I was unable to locate any large groups in the Cloudy-Sunshine Mountains in early June, 1971. They may have moved from the area by that time. In 1970 a large group was found there in April (approximately 700).

Caribou appeared on the Nixon Flats in early November, 1971, and had apparently moved into the Sunshine Mountains by mid-February, 1972, two to four weeks earlier than usual. The relationships of those caribou to the Beaver Mountains herd is still unclear.

Big River-Farewell-Telida Group, Unit 19

Harvest and Hunting Pressure

Hunting pressure in these areas was light. Ten to 15 caribou were taken in the Big River area in winter, 1970-71. Guides took an unknown but small number in the Alaska Range. Perhaps 12 to 18 were taken by Nikolai-Telida hunters. No more than six were taken by McGrath hunters. Several were taken near Farewell.

Composition, Productivity and Distribution

No surveys to measure these parameters were done. It appeared that fewer caribou wintered in the Big River area in 1971 than in the previous two years. Scattered small bands wintered in the Farewell area in 1970-71. On January 6, 1972, Peter Shepherd and Steve Reynolds, Protection, found 200 to 300 caribou in the vicinity of Post Lake, south of Farewell, and considerable sign along the South Fork, Kuskokwim River.

On June 21, 1971, Peter Shepherd found 1500 to 2000 cows with calves in the Bonanza Hills area (Unit 17). One group examined for composition included 400 cows and 90 calves, however, this may have been higher than the overall situation.

Management Summary and Conclusions

No changes are recommended for Units 18, 19 and 21.

Submitted by: Richard H. Bishop, Game Biologist IV

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 20 - Fairbanks, Central Tanana (Delta Herd)

Seasons and Bag Limits

Aug. 10 - March 31 Three Caribou

Harvest and Hunting Pressure

Based on complete harvest ticket returns, the legally reported caribou kill in the Delta herd for the 1970-71 season consisted of 275 animals (198 males, 68 females, and 9 sex unknown), an increase of 50 caribou over the 1969-70 harvest when 225 were taken.

The 1971-72 harvest consisted of 624 caribou (387 males, 225 females, and 12 sex unknown). The bull composition of the harvest has decreased from 75 percent in 1969-70, to 72 percent in 1970-71, to 62 percent the past season.

Appendix I summarizes the successful hunters by residence, and reflects the increasing hunting pressure exerted on the herd the past two seasons. The number of successful hunters rose from 192 in 1970-71 to 395 in 1971-72. Residents comprised 58 percent of successful hunters in 1970-71, while 67 percent of successful hunters in 1971-72 consisted of residents. Nonresidents, on the other hand, declined from 38 percent to 30 percent of the successful hunters over the past two seasons.

Appendix II lists the number of animals taken by residents and nonresidents, and reflects the increasing resident hunting pressure. The number of caribou taken by successful resident hunters rose from 182 in 1970-71 to 464 in 1971-72, representing an increase of 8 percent in the harvest taken by residents, while the percent of the harvest furnished by nonresidents decreased by 8 percent over the past two seasons.

Appendix III summarizes the distribution of success for the past two seasons, and represents a declining success for those reporting killing none, one, and two caribou. The number of hunters killing no animals rose 5 percent, those reporting one animal taken decreased 7 percent, those reporting two decreased by 1 percent, while the percent of hunters taking three rose by 4 percent. Nevertheless, the increase in total reporting hunters in all categories further reflects the increased hunting pressure for this herd.

Appendix IV presents harvest chronology data for the past two seasons, reflecting the large harvest which occurs during the first seven weeks of the season. Eighty-three percent of the known date bull harvest in 1970-71 occurred before October 2, while 64 percent of the bulls were taken before October 2 during the 1971-72 season. While female harvest

is more evenly distributed throughout the season, 70 percent and 50 percent of the known date harvest of both sexes occurred from August 10 through October 1 for the 1970-71 and 1971-72 seasons, respectively.

Composition and Productivity

Fall composition counts were conducted on the Delta herd on October 29 and 30, and November 1, 1971. Results of these counts indicate a bull:cow ratio of 29:100, a yearling:cow ratio of 11:100 and a calf:cow ratio of 16:100. Bulls comprised 19 percent of the sample, yearlings 7 percent, and calves 10 percent.

Spring production counts were not conducted in 1971 and 1972; data from March, 1970 indicated a short yearling:cow ratio of 21:100.

Aerial surveys made in fixed-wing aircraft to monitor herd distribution and movements during June, 1972 indicated an abnormally low number of new-born calves present.

Management Summary and Conclusions

Parameters used to assess herd status (harvest, hunting pressure, composition and productivity) indicate an overharvest may have occurred in the 1971-72 season. An increasing harvest (rising annually from 205 in 1968-69 to 624 in 1971-72), greater participation and success by resident hunters combined with concentrated guiding activity, declining bull:cow ratios in conjunction with a bull harvest of 62-75 percent of the total harvest the past three seasons, as well as poor production and survival, indicate the need for future restrictions on harvest with the aim of stabilizing herd numbers.

A better estimate of herd size is necessary before comprehensive management plans can be formulated. In order to sustain the 1971-72 harvest, the herd would have to number some 9,000 animals for recruitment at the 7 percent level to compensate for hunting mortality (assuming adult mortality is solely from hunting and yearlings are not harvested).

Proper herd management for maximum trophy production cannot be achieved if 60 percent of the harvest continues to come from a relatively small portion (approximately 20 percent) of the population in a herd already showing a depressed bull:cow ratio. As the number of adult trophy bulls decreases, harvest of the female segment by resident recreational hunters should increase, with the long-term effect of restoring the bull:cow ratio to a desirable level. However, in order to insure maximum recreational opportunity while maintaining the trophy status of the herd, it is recommended that the season length remain unchanged and the bag limit be reduced from three to one caribou.

An evaluation of the caribou range on the north slope of the Alaska Range is needed to determine if the range will support larger herd numbers following conservative management practices.

Submitted by: Mel Buchholtz, Game Biologist II

CARIBOU - GMU 20 - Fairbanks, Central Tanana (Delta Herd)

Appendix I

Delta caribou herd, summary of successful hunters by residence, 1970-71, 1971-72 seasons.

	Total Successful Hunters	No. of Residents	%	No. of Nonresidents	%	Unspecified Residency	%
1970-71	192	112	58	74	38	6	3
1971-72	395	266	67	117	30	12	3

Submitted by: Mel Buchholtz, Game Biologist II

CARIBOU - GMU 20 - Fairbanks, Central Tanana (Delta Herd)

APPENDIX II

Delta caribou herd harvest by residency of hunter, 1970-71, 1971-72 seasons.

	Total reported kill	Total reporting hunters (successful & unsuccessful)	No. of animals taken by residents	Percent of harvest taken by residents	No. of animals taken by nonres.	Percent of harvest taken by nonres.	No. of animals taken by unspecified residency	Percent of harvest by hunters of unknown residency
1970-71	275	293	182	66	85	31	8	3
1971-72	624	644	464	74	143	23	17	3

APPENDIX III

Delta caribou herd, hunter distribution of success, 1970-71, 1971-72 seasons.

	No. of hunters killing none	Percent of hunters killing none	No. of hunters killing one	Percent of hunters killing one	No. of hunters killing two	Percent of hunters killing two	No. of hunters killing three	Percent of hunters killing three
1970-71	101	34	129	44	43	15	20	7
1971-72	249	39	237	37	87	14	71	11

Submitted by: Mel Buchholtz, Game Biologist II

CARIBOU - GMU 20 - Fairbanks, Central Tanana (Delta Herd)

APPENDIX IV

Delta caribou herd, hunter harvest chronology, 1970-71, 1971-72 seasons.

	Time Period	Number of females harvested	Percent of known date of female harvest	Number of males harvested	Percent of known date of male harvest	Number of both sexes harvested	Percent of known date harvest of both sexes
1970-71							
	Aug. 10-Oct. 1	14	34	111	83	129	70
	Oct. 2-Jan. 14	7	17	5	4	17	9
	Jan. 15-Mar. 31	20	49	17	13	37	20
	Known date kills	41		133		183	
1971-72							
	Aug. 10-Oct. 1	55	29	194	64	252	50
	Oct. 2-Jan. 14	38	20	42	14	84	17
	Jan. 15-Mar. 31	94	50	65	22	163	33
	Known date kills	187		301		499	

Submitted by: Mel Buchholtz, Game Biologist II

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 23, 24, and 26 (Arctic Herd)

Seasons and Bag Limits

No closed season	No limit

Harvest and Hunting Pressure

Harvest tickets are not required for caribou in any of these units so an accurate estimate of the total harvest cannot be obtained. The harvest level is directly related to the migration routes that the caribou use each year. This year the caribou passed near Ambler, Shungnak, Kobuk, Selawik, Hughes and Anaktuvuk Pass both in the spring and fall, consequently the harvest was high in those villages. The harvest in the other villages in these units was below normal. These caribou wintered further south this year with some reported south of the Yukon River.

Composition and Productivity

A major census was completed last year and revealed a minimum population of 242,000 in the Arctic herd.

Aerial census of calves and cows was conducted on the calving grounds in mid-June and 5,184 adult cows and 4,085 calves were counted for a cow:calf ratio of 100:78.

Management Summary and Recommendation

The harvest this year appears to be about normal or a little less than normal. This harvest level apparently has little affect on a herd of the size of the Arctic caribou herd. It is recommended that the liberal seasons and bag limits remain unchanged.

Submitted by: Robert E. Pegau, Game Biologist III

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 24, 25 and 26 and Yukon Territory, Canada (Porcupine Herd)

Seasons and Bag Limits

No closed season	No limit

Harvest and Hunting Pressure

The Porcupine herd is mainly accessible to hunter use from only Arctic Village and Kaktovik within Alaska. Hunter use in both Alaska and Canada is thought to be insignificant and there is very light sport hunting of this herd within Alaska.

Composition and Productivity

Calef and Lortie estimated spring and fall calf proportions in the herd of 16 percent. More detailed information can be obtained from the following report:

Calef, G. W. and G. M. Lortie. 1971. Observations of the Porcupine Caribou Herd. April 1 - September 22, 1971. Environmental Protection Board, Winnipeg. 46 pages.

Herd Status and Distribution

A summary of the information available concerning the Porcupine caribou herd was presented in the following publication:

LeResche, Robert E. 1972. The International Herds: Present Knowledge of the Fortymile and Porcupine Caribou Herds. First International Rangifer Symposium, College, Alaska (in press).

LeResche reports the herd size to be from 100,000 to 150,000. More detailed information will be available in the 1972 survey-inventory progress report.

Management Summary and Recommendations

Present human use does not appear to be a significant factor in the welfare of the Porcupine caribou herd. In the advent of oil development, including the building of oil and gas pipelines, in areas presently occupied by the Porcupine herd, surveillance should continue in order to anticipate any detrimental influence upon the herd. In the interim, the liberal season and bag limit should remain unchanged.

Submitted by: Oliver E. Burris, Game Biologist IV

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 4 - Admiralty, Baranof and Chichagof islands

Seasons and Bag Limits

Sept. 1 - June 10 (seasons during calendar year 1971 were April 1 - June 10 and Sept. 1 - Dec. 31)	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The harvest of brown bears in Unit 4 during the calendar year 1971 was 77 animals, a slight increase from the 72 recorded in 1970 (the 1970 S&I report recorded the take for that year as 66; six additional sealing certificates were found after that report was written). This is the largest number reported taken in Unit 4 since the beginning of the sealing program in 1961.

The majority of these animals (51% of the total) were taken on Admiralty Island, as has been the case every year except one in the last eight years. Further, most of these (72% of the Admiralty total) continued to be taken on South Admiralty (south of Kootznahoo Inlet and Gambier Bay). However, in this area the harvest was more spread out than in past years with Hood Bay, for the third time in four years, contributing none at all and Eliza Harbor contributing six in comparison with its average of one per year and a previous high of three. The distribution of the Unit 4 bear kill from 1964 through 1971 is shown in Appendix I.

Composition and Productivity

The sex composition of the population is unknown. Composition of the harvest in 1971 was 74 percent males, compared to 73 percent the previous year and a 10-year average (1961-1970) of 73 percent. On Baranof Island the composition was 61 percent males, on Chichagof 83 percent and on Admiralty 66 percent. These figures, of course, represent the results of hunters selecting larger bears when possible.

During tagging operations at Hood Bay in the spring of 1971, three of approximately 20 separate adult bears seen were sows with cubs. Two of these sows had two cubs each, while the third, which was glimpsed only briefly, had at least two cubs. No other information is available on productivity.

The average age of 65 Unit 4 bears from which teeth were extracted for cementum counts in 1971 was 8.0 years. The average age of 44 males was 8.3 years. Differences in average ages and average skull sizes between the various parts of Unit 4 were small, the most notable difference being that Chichagof bears (averaging seven years of age) produced larger skulls ($\bar{x}$ = 22.3 inches) on the average than the older bears of Admiralty (8.2 years, 21.5 inches) or Baranof (8.7 years, 22.2 inches). On South Admiralty the average age of all bears taken was slightly lower than for Admiralty as a whole (8.0 years vs. 8.2) but the difference is probably not significant. Still, as mentioned in last year's report, the South Admiralty area should be watched carefully in the future because of its comparatively high contribution to the harvest per unit of area. Currently, average ages of all bears and of male bears are the oldest of any of the high-production areas in the state.

Management Summary and Conclusions

There appears to be a trend toward an increasing proportion of Unit 4 bears being taken on Chichagof Island. Analysis of ages and skull sizes of male bears and of the sex composition of the harvest shows no evidence of any decline in population levels in Unit 4.

Recommendations

No regulation changes are recommended at this time.

Submitted by: Alan Courtright, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 4 - Admiralty, Baranof and Chichagof islands

APPENDIX I

Brown Bear Harvest, S. Admiralty and ABC Totals (legal sport kill only)

Location		1964	1965	1966	1967	1968	1969	19/0	1971
Pybus Bay		3	4	16	7	5	3	10	8
Gambier Bay		9	7	3	1	4	3	7	4
Chaik Bay		3	5	3	3	2	4	2	1
Hood Bay		1	1	2	6	0	4	0	0
		16	17	24	17	11	14	19	13
% of Adm. total		48%	51%	53%	53%	38%	45%	49%	33%
% of S. Adm. total		84%	89%	69%	72%	69%	56%	73%	43%
	$\bar{x}$	4.0	4.25	6.0	4.25	2.75	3.5	4.75	3.25
Kootznahoo Inlet Area		0	1	2	2	2	2	2	3
Eliza Harbor		0	0	3	0	1	3	0	6
Little Pybus Bay		1	0	1	1	0	4	0	1
		1	1	6	3	3	9	2	10
% of Adm. total		3%	3%	13%	9%	10%	29%	5%	26%
% of S. Adm. total		5%	5%	17%	14%	19%	36%	8%	33%
	$\bar{x}$	0.3	0.3	2.0	1.0	1.0	3.0	0.7	3.3
Whitewater Bay		1	0	2	0	0	2	1	2
Tyee area		0	1	2	1	1	0	1	2
Wilson Cove		1	0	1	1	1	0	2	3
		2	1	5	2	2	2	4	7
% of Adm. total		6%	3%	11%	6%	7%	6%	10%	18%
% of S. Adm. total		11%	5%	14%	19%	13%	8%	15%	23%
	$\bar{x}$	0.7	0.3	1.7	0.7	0.7	0.7	0.7	2.3
S. Adm. total		19	19	35	22	16	25	26	30
% of Adm. total		58%	58%	78%	69%	55%	81%	67%	72%
Admiralty Total		33	33	45	32	29	31	39	39
% of Unit 4		65%	52%	62%	51%	57%	47%	54%	51%
Baranof total		5	14	12	14	6	11	12	13
% of Unit 4		10%	22%	16%	22%	12%	17%	17%	17%
Chichagof total		13	16	16	17	16	24	21	25
% of Unit 4		25%	25%	22%	27%	31%	36%	29%	32%
Unit 4 total		51	63	73	63	51	66	72	77

Submitted by: Alan Courtright, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 5 - Yakutat

Seasons and Bag Limits

Oct. 10 - Nov. 30 May 10 - May 25	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The sport kill of brown bear in Unit 5 during the calendar year 1971 was 20 animals consisting of 12 males, 6 females and 2 sex unknown. Harvest distribution during the 1971 spring and fall seasons was 11 (6 males, 3 females and 2 sex unknown) and 9 (6 males and 3 females), respectively. In 1970 the sport kill was 7 bears (4 males and 3 females). Nonresidents took 35 percent of the 1971 harvest and in 1970, 57 percent of the harvest. The nonsport kill for 1971 was one bear.

The mean male hide size, skull size and cementum age in 1971 were 14.0 feet (length plus width), 22.1 inches (length plus width) and 5.8 years (sample size 8), respectively. The 1970 mean age of three bears was 9.0 years. The mean age of 14 brown bears (both sexes) harvested in Unit 5 in 1971 was 4.9 years. The Unit 5 1970 mean age of five bears (both sexes) was 7.0 years. Game Management Unit 5 contributed 18.7 percent towards the total brown bear harvest of Southeastern Alaska (Units 1-5) and 2.7 percent of the statewide harvest (Units 1-26) in 1971.

Composition and Productivity

No composition data other than those resulting from harvest information are available.

Management Summary and Recommendations

The 1971 harvest of 20 brown bears is slightly higher than the 1965-1969 average of 18.0 bears and considerably higher than the 1970 harvest of seven bears. Harvest information suggests that factors in addition to a reduced fall season resulted in a low 1970 brown bear harvest and it is not necessarily related to a low bear population. The most drastic difference between the 1970 and 1971 harvests (other than the numbers killed) was the mean age of males. The meal male age decreased from 9.0 (sample size 3) in 1970 to 5.8 (sample size 8) in 1971. Sample sizes are believed to be too small to draw significant conclusions at this time. Further, shorter seasons have not demonstrated completely at this

time to have reduced the bear harvest in Unit 5. Despite shorter seasons the harvest has remained relatively stable.

Bear abundance and light hunting pressure indicate Unit 5 can support increased recreational hunting. A season from September 1 through June 10 is recommended.

Submitted by: David Zimmerman, Game Biologist II

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 6 - Prince William Sound

Seasons and Bag Limits

May 10 - May 25 Oct. 10 - Nov. 30	One bear every four reglatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The annual brown bear harvest in Unit 6 peaked in 1968 and has since continued to decline. The 1971 harvest of 19 bears is the lowest since 1961 (Appendix I). Two more bears were taken in defense of life or property. As usual, the spring harvest (12) was greater than the fall harvest (7) even though the spring season was shortened to 16 days (Appendix II).

The actual hunting pressure exerted during 1971 is unknown. Several reconnaissance flights during the bear season revealed very little hunting effort.

Composition and Productivity

A brown bear survey from Okalee Spit to Icy Bay was flown August 24, 1971. A total of 14 bears were observed which compares favorably with surveys flown in 1969 and 1970 (Appendix III). The number of bears counted during this survey is too small to give meaningful composition and productivity data.

Management Summary and Conclusions

The present annual harvest level is not adversely affecting the brown bear population in Unit 6; this conclusion is supported by the data in Appendix I.

The small harvest can probably be attributed to several factors: 1) the short spring season, 2) the late fall season, 3) foul easterly weather, plus 4) other areas have better and more easily hunted bear populations.

Although the annual bear harvest could be increased slightly, it would be wise to carry the present season for another year to determine if the present harvest level continues. There is a possibility that the area may periodically receive heavy hunting pressure.

Recommendations

Retain the current season and bag limits.

Submitted by: Julius Reynolds, Game Biologist III.

BROWN/GRIZZLY BEAR - GMU 6 - Prince William Sound

APPENDIX I

Brown/Grizzly Bear Sport Harvest, Calendar Years 1961 Through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961	13	8	62	3	23	13.2			1/1 - 6/30 9/1 - 12/31
1962	24	17	71	9	38	13.3			Same
1963	32	16	53	5	16	14.0			Same
1964	32	22	76	9	28	14.6			Same
1965	34	18	53	8	24	15.4			Same
1966	38	20	53	7	18	14.6			Same
1967	56	35	70	26	46	14.2	22.4		1/1 - 6/20 9/1 - 12/31
1968	63	39	67	33	52	14.4	23.5	7.1 (26)	1/1 - 6/10 9/1 - 12/31
1969	23	12	55	8	35	14.7	23.4	9.3 (10)	1/1 - 6/10 9/15 - 11/30
1970	27	12	46	9	33	14.5	23.6	5.9 (8)	4/1 - 5/31 10/10 - 11/30
1971	19	13	68	10	53	14.9	24.1	9.2 (12)	5/10 - 5/25 10/10 - 11/30

[1] All male % based on known-sex bears.
[2] Length plus width given in feet.
[3] Length plus width given in inches.
[4] Tooth sample size in parentheses.

Submitted by: Julius Reynolds, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 6 - Prince William Sound

APPENDIX II

Brown Bear Harvest by Season and Sex

Year	Spring				Fall				Total			
	Male	Female	Unk.	Total	Male	Female	Unk.	Total	Male	Female	Unk.	Total
1971	10	2		12	3	4		7	13	6	0	19
1970	8	10		18	4	4	1	9	12	14	1	27
1969	8	5	1	14	4	5		9	12	10	1	23
1968	21	12	4	37	18	7	1	26	39	19	5	63
1967	22	7	3	32	13	8	3	24	35	15	6	56
1966	14	9	1	24	6	8		14	20	17	1	38
1965	12	11		23	6	5		11	18	16	0	34
AVERAGE	13.6	8.0		22.9	7.7	5.9		14.3	21.3	13.9		37.1

Submitted by: Julius Reynolds, Game Biologist III

APPENDIX III

Unit 6 Coastal Brown Bear Survey

Okalee Spit to Icy Bay

	1971 (8/24)	1970 (9/8)	1969 (8/12)
Total	14	12	16
Total Adults	8	9	14
Single Adults	5	6	13
Total Cubs	6	3	2
Sow with 1	1 Lg.	2 Lg., 1 Sm.	0
Sow with 2	1 Lg.	0	1 Lg.
Sow with 3	1 Sm.	0	0

Lg. = Large cub, greater than one year old.

Sm. = Small cub, less than one year old.

Submitted by: Julius Reynolds, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 7 - Seward

Seasons and Bag Limits

Sept. 20 - Oct. 15	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Brown/grizzly bear sealing records indicate that there were no brown bears harvested in Unit 7 during the 1971-72 season.

Composition and Productivity

No data are available.

Management Summary and Conclusions

With no new data for analyses no conclusions can be drawn.

Recommendations

The Unit 7 season should continue to coincide with the Unit 15 season since brown bears in this unit are generally found along the Unit 15 boundary and are part of the same bear population.

Submitted by: Paul A. LeRoux, Game Biologist III.

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 8 - Kodiak and Adjacent Islands

Seasons and Bag Limits

Unit 8, that portion of Kodiak Island south and west of the Kodiak National Wildlife Refuge boundary and Uganik Island	Oct. 20 - Dec. 31 March 1 - May 10*	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Unit 8, remainder of Kodiak Island	Sept. 1 - June 30	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Unit 8, Raspberry, Afognak and Shuyak Islands only	Oct. 31 - Dec. 31 March 1 - May 31	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

*Season was extended to May 15 by emergency regulation.

Harvest and Hunting Pressure

Brown/grizzly bear sealing records indicate a sport harvest of 112 bears in Unit 8 during the 1970-71 season. Twenty-five of these bears were harvested from areas other than the National Wildlife Refuge; only two were taken from Afognak Island. The total harvest represents a 23.1 percent increase over the previous season and is slightly above the previous three-year average of 97 bears. The spring season produced 63 bears, while the fall season accounted for 49 bears.

Nonresidents harvested 46 percent of the bears, a slight decrease from the previous year. The percentage of females in the harvest increased while the number of males harvested remained the same as the previous three years. Sealing data indicate an increase in skull size and mean age of male bears taken (Appendixes I and II).

Composition and Productivity

No information is available at this time.

Management Summary and Conclusions

The Kodiak National Wildlife Refuge continued to issue land use permits to bear hunters during 1971. This system has been effective in distributing hunters in space and time, thereby reducing hunter conflicts. Corollary benefits of the permit system have been a considerable decrease in harvest and increase in population levels.

The Kodiak bear population appears capable of sustaining a higher level of harvest than is presently being achieved. Observations made during field work, combined with observations and comments from local guides and residents, indicate a gradual increase in bear numbers and reproduction rates since 1968. This information combined with increasing mean ages and skull sizes of harvested males suggests a relaxation of seasons is warranted.

Recommendations

It is recommended that an additional five days be added to the spring season within areas encompassed by the Kodiak National Wildlife Refuge.

Submitted by: Jack E. Alexander, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 8 - Kodiak and Adjacent Islands

APPENDIX I

Brown/Grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons[5]
1961	118	78	66	72	61	16.9			1/1 - 5/31 10/1 - 12/31
1962	131	91	78	84	64	16.5			Same
1963	112	77	69	55	49	16.2			Same
1964	118	72	63	62	53	15.2			Same
1965	186	111	60	90	48	15.7			Same
1966	199	106	54	96	48	15.7			Same
1967	184	107	58	91	49	15.3	23.6	5.0(14) Fall	1/1 - 5/20 10/1 - 12/31
1968	104	61	59	62	60	15.6	23.9	6.2(52)	Same
1969	97	62	64	53	55	15.9	24.2	6.2(53)	1/1 - 5/20 11/1 - 12/31
1970	91	62	68	45	49	15.3	23.6	6.0(57)	3/1 - 5/10 10/20 - 12/31
1971	112	62	60	51	46	15.1	24.0	6.8(59)	3/1 - 5/10* 10/20 - 12/31

*Season was extended until May 15 by emergency regulation.

1/ All male % based on known-sex bears.
2/ Length plus width given in feet.
3/ Length plus width given in inches.
4/ Tooth sample size in parentheses.
5/ Kodiak National Wildlife Refuge only.

Submitted by: Jack E. Alexander, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 8 - Kodiak and Adjacent Islands

APPENDIX II

Average Male Brown/Grizzly Skull Size Recorded in Inches, and by Year, Season and Residency of Hunter for Unit 8.

	SPRING				FALL				TOTAL		
	Resident		Nonresident		Resident		Nonresident				Sample
Year	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	Size %
1967	-	-	-	-	8	23.0	19	23.9	27	23.6	93
1968	23	23.7	21	24.3	1	27.7	13	23.4	58	23.9	95
1969	24	23.9	25	24.5	5	24.6	5	23.9	59	24.2	95
1970	16	23.7	16	23.5	13	24.2	14	23.3	59	23.6	95
1971	20	24.5	12	24.7	11	23.2	12	23.4	55	24.0	89

Submitted by: Jack E. Alexander, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 9 - Alaska Peninsula

Seasons and Bag Limits

Spring Season	May 10 - May 25	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Fall Season	Oct. 1 - Oct. 31	

Harvest and Hunting Pressure

The reported harvest in 1971 for Unit 9 was 190 brown bears. During the spring season, 53 bears were taken. The spring harvest was composed predominantly of male animals (83 percent). Eighty-one percent of the spring bear hunters were nonresidents. During the fall season, 137 bears were harvested. The percentage of male bears taken (58 percent) decreased somewhat as did the percentage of successful nonresidents (67 percent) who hunted. For the entire season, 65 percent of the bears taken were males and 71 percent of the successful hunters were nonresidents. The historical brown/grizzly bear harvest for Unit 9 is presented in Appendix I. There was a slight decrease in the average skull size for male bears (Appendix II).

Management Summary and Conclusions

The 1971 seasons produced the largest reported harvest of brown bear in Unit 9 since 1967. Once again the majority of bears taken were males although the female percentage of the harvest was the highest yet recorded. However, the mean male age and skull size data do not indicate the harvest has been excessive. The increased harvest of females is not considered biologically detrimental to the population. Logically such an increase would be expected as the long history of a predominantly male harvest would gradually alter the population in favor of females. As females cannot be taken while accompanied by cubs, the opportunity to harvest mature females is restricted to one year in every three or four. The increased female harvest reflects the fact that as the percentage of females in the population increases, numerically more females are available to the hunters as legal unaccompanied bears.

As in past years, nonresidents have been the primary segment of the public to harvest bears in Unit 9. Alaskan residents are discouraged from hunting the Alaska Peninsula by the existing regulation requiring registration of a camp one month prior to the opening of the seasons. It is almost impossible for a hunter without prior experience on the Peninsula to preselect a camp site in a productive bear hunting area.

The expense of logistics to and within the unit are such as to preclude Alaskan residents residing outside of the unit from making the necessary effort to become sufficiently acquainted with the Peninsula to select a good hunting camp. Nonresidents do not have this problem as their guides provide them with the necessary information to properly register for the area they will be hunting.

The existing regulation requiring both guides and hunters to register camps has proven both administratively unworkable for the Department and discriminatory against Alaskan residents. It should be modified to remedy this problem.

Recommendations

No changes in seasons or bag limits are recommended. The camp registration regulation should be modified so that only guides are required to register camps. It should also be altered so that a single registration could include both the spring and fall seasons without requiring separate registration for each season.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 9 - Alaska Peninsula

APPENDIX I

Brown/Grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males	No. Nonres.	% Nonres.	Mean Hide Size Male[1]	Mean Skull Size Male[2]	Mean Cem. Age Male[3]	Calendar Year Season
1961	120	85	73	71	59	16.4			1/1-5/31, All of 9; 10/1-12/31, S. of Egegik Paule Bay. Rem. of Unit 9/10 - 12/31
1962	155	109	70	97	63	16.4			Same
1963	164	100	65	114	70	16.1			1/1-5/31, 9/1-12/31
1964	155	103	70	108	70	16.1			Same
1965	208	136	67	137	66	15.7			1/1-5/31, All 9 N. of Meshik 9/1-12/31 S. of Meshik 9/15-12/31
1966	230	157	71	173	75	15.7			N. of Meshik 1/1-5/31, 9/1-12/31, S. of Meshik 1/1-5/31 & 9/15-12/31
1967	211	143	68	163	77	15.8	23.5	6.6(30)	1/1-5/20, 9/15-12/31
1968	158	111	73	134	85	15.5	24.3	7.6(48)	1/1-5/10, 9/15-12/31
1969	91	67	75	67	74	15.8	24.5	8.0(57)	1/1-5/10 All of 9 & 9/15-10/30. N. of Park, 10/1-11/30 S of Park
1970	156	102	66	116	74	15.1	24.0	7.8(90)	S of Park 5/1-5/15, N. of Park 5/1-5/25, All of 9 10/1-10/31
1971	190	118	65	135	71	15.1	23.7	7.1(109)	5/10-5/25, 10/1-10/31

[1]/Length plus width given in feet. [2]/Length plus width given in inches. [3]/Tooth sample size in parentheses.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 9 - Alaska Peninsula

APPENDIX II

Average Male Brown/Grizzly Skull Size Recorded in Inches, and by Year, Season and Residency of Hunter for Unit 9.

	SRING				FALL				TOTAL		
	Resident		Nonresident		Resident		Nonresident				Sample
Year	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	Size %
1967	-	-	-	-	6	23.9	44	23.5	50	23.5	93
1968	5	23.5	49	25.5	9	23.3	40	23.0	103	24.3	93
1969	10	23.9	36	25.5	5	22.5	15	23.2	66	24.5	99
1970	10	24.4	43	25.5	14	21.0	32	23.2	99	24.0	97
1971	4	26.2	37	24.8	22	22.3	50	23.2	113	23.7	96

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 10 - Bristol Bay

Seasons and Bag Limits

Spring Season	May 10 - May 25	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Fall Season	Oct. 1 - Oct. 31	

Harvest and Hunting Pressure

During the fall season, four bears were reported taken. No animals were reported harvested during the spring season. Of the four bears, three were females and all were taken by Alaskan residents (Appendix I). This sample size is too small to allow for meaningful analysis of sex ratios, skull sizes or hide sizes in the harvest.

Composition and Productivity

Thirty-six bears were observed during a reconnaissance survey of Unimak Island on October 5, 1971. Single bears made up 53 percent of the observed sample. The mean litter size for the six sows with cubs observed was 2.8 cubs per litter.

Management Summary and Conclusions

The brown bear population in Unit 10 is restricted to Unimak Island. This Island is part of the Aleutian Island Refuge System and hunting is controlled by a permit system regulated by the U. S. Fish and Wildlife Service. The present level of harvest is considered conservative and the population could withstand a higher level of harvest. However, the harvest will be primarily controlled by the permit system so more liberal hunting regulations to encourage a greater harvest are not recommended.

Recommendations

No changes in the seasons or bag limits are recommended.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 10 - Bristol Bay

APPENDIX I

Brown/Grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males	No. Nonres.	% Nonres.	Mean Hide Size Male[1]	Mean Skull Size Male[2]	Mean Cem. Age Male[3]	Calendar Year Season
1961	1	1	100	0	0	18.1			1/1-5/31 10/1-12/31
1962	3	2	67	0	0	16.6			Same
1963	0	0	0	0	0	0			1/1-5/31 9/1-12/31
1964	15	9	60	5	33	16.4			Same
1965	10	7	70	1	10	15.9			1/1-5/31 9/15-12/31
1966	6	4	67	1	17	16.1			Same
1967	8	3	38	0	0	13.4	23.5		1/1-5/20 9/15-12/31
1968	4	2	50	4	100	14.9	23.2	5.0(2)	Same
1969	4	3	75	0	0	19.4	27.3	15.0(1)	1/1-5/10 10/1-11/30
1970	5	4	80	0	0	12.5	19.9	3.0(4)	5/1-5/15 10/1-10/31
1971	4	1	25	0	0	15.4	23.4	4.0(1)	5/10-5/25 10/1-10/31

[1]/Length plus width given in feet. [2]/Length plus width given in inches. [3]/Tooth sample size in parentheses.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - Wrangell Mountains - Chitina River

Seasons and Bag Limits

Sept. 15 - Oct. 5	One bear every four reglatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Hunting pressure is not known as harvest ticket analyses are not completed. Seventeen bears were sealed during the 1971 regulatory year of which nine were males. Data from the sealing program are summarized in Appendix I. No defense of life or property kills were reported during 1971.

Composition and Productivity

No data available.

Management Summary and Conclusions

There has been no significant change in number, age or size of bears harvested from Unit 11 since at least 1961. Hunting has had no apparent effect on the bear population in this unit.

Recommendations

There is no reason for not providing a spring season in Unit 11. It is therefore recommended that a spring season be established to run from May 15 through May 31. It is also recommended that the fall season continue to coincide with the season in contiguous Unit 12. It is further recommended that the harvest ticket requirement for brown/grizzly bears be discontinued as the desired data are obtained through the sealing program.

Submitted by: Loyal J. Johnson, Game Biologist III.

BROWN/GRIZZLY BEAR - GMU 11 - Wrangell Mountains - Chitina River

APPENDIX I

Brown/Grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Spring	Fall	Total	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961			5	3	75	2	40	11.8			5/15-6/15 9/1-12/31
1962			14	6	43	11	79	12.4			Same
1963			9	6	67	7	78	12.6			Same
1964			22	13	65	16	73	13.2			Same
1965	2	16	18	8	47	14	78	13.3			Same
1966	0	12	12	10	91	9	75	12.4			Same
1967	3	17	20	10	50	15	75	12.4	23.2		Same
1968	3	12	15	8	53	7	47	12.0	20.9	6.8(4)	Same
1969	2	7	9	6	67	2	22	15.3	22.8	7.2(5)	5/15-6/15 9/1-9/30
1970	5	11	16	10	63	7	44	13.5	22.0	8.9(9)	5/15-6/10 9/15-10/5
1971	No season	17	17	9	64	15	88	13.9	23.5	8.8(9)	9/15-10/5

[1] All male % based on known-sex bears.
[2] Length plus width given in feet.
[3] Length plus width given in inches.
[4] Tooth sample size in parentheses.

Submitted by: Loyal Johnson, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 12 - Upper Tanana-White River

Seasons and Bag Limits

Sept. 15 - Oct. 5	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Harvest data for Unit 12 since 1961 are presented as follows:

Year	M	F	Total	Mean Hide Size	Mean M Skull Size
1961	11	4	15	11.8	Not Available Prior to 1967
1962	9	10	19	11.8	
1963	13	10	23	12.0	
1964	9	6	15	13.1	
1965	8	11	19	12.5	
1966	6	6	12	12.7	
1967	7	9	16	11.4	20.5
1968	7	9	16	11.8	20.4
1969	8	5	13	11.6	19.9
1970	9	6	15	12.0	21.9
1971	9	4	13	11.8	20.7

The total harvest figures for Unit 12 have not changed appreciably since 1961. Hunting pressure for grizzly bears is difficult to measure since most residents are opportunistic hunters, and will take a bear whenever legally available. Considering the percentage of success, it is likely that many nonresident hunters purchase grizzly tags, hoping they may have an opportunity to take a grizzly, even though no special effort is made to specifically hunt for grizzlies. Nonresident grizzly tag sales may be the best indicator of hunting pressure; however, it can not be used to determine the pressure within a specific game management unit.

Composition and Productivity

No data.

Management Summary and Recommendations

Casual observations indicate that the grizzly bear population throughout Unit 12 is moderate and appears to be increasing. The slightly diminished hide and skull sizes, and the average cementum age

of 4.4 years for the 1971 harvest indicates that more younger animals were harvested. This probably indicates a young, growing population.

Because grizzly hunting in this area is generally nonselective as to size (hunters normally take the first legal bear available), age data from the harvest should reflect the age composition of the bear population.

Most of Unit 12 is prime grizzly habitat with a good grizzly population. The 1971 harvest of 13 animals is probably not limiting or controlling the population. The bear population is capable of sustaining a higher harvest; therefore, I recommend a spring season in 1972 with no change in the fall season or bag limit.

Submitted by: Larry Jennings, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 13 - Nelchina Basin

Seasons and Bag Limits

Sept. 1 - Oct. 5	One bear every four regiatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Until 1971, hunting pressure and harvest were only moderate in Unit 13. However, upon recommendation of the staff the Board opened the season on September 1, 15 days earlier than usual so that moose hunters could avail themselves of the opportunity to bag a grizzly bear. The result was the largest kill of bears to date from Unit 13, 72 bears. Not only was the kill the largest but the mean hide sizes and mean ages were significantly lower than average. Eighty-seven percent of the kill occurred during the very productive portion of moose season, September 1-20, when many hunters were afield. Harvest and biological data are shown in Appendix I.

There was one defense of life and property kill reported during 1971; this animal is not included in Appendix I data.

Composition and Productivity

No data available.

Management Summary and Conclusions

While no quantative data on populations or productivity are available, the increased kill and decrease in hide size and ages of bears killed indicates that an annual harvest of the 1971 magnitude could not continue on a sustained basis.

Recommendations

It is recommended that the brown/grizzly bear season for Unit 13 be September 10 - October 10. There is no justification for a spring season because of the vulnerability of bears to aircraft hunters. Although considered illegal, aerial hunting is known to occur.

It is also recommended that the harvest ticket requirement for brown/grizzly bears be discontinued as the data so gathered are readily obtained through the sealing requirement.

Submitted by: Loyal J. Johnson, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 13 - Nelchina Basin

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961	42	20	50	26	62	13.0			9/1-9/30
1962	34	22	65	19	56	13.8			Same
1963	42	22	54	27	64	12.6			Same
1964	35	14	41	22	63	12.8			Same
1965	44	25	58	21	48	12.9			Same
1966	63	33	56	41	65	13.2			Same
1967	29	16	57	13	45	12.8	21.5	6.5(15) Fall	9/15-10/5
1968	38	18	49	19	50	12.9	22.0	5.9(9)	
1969	17	15	88	9	53	13.4	22.5	6.9(12)	9/20-10/20
1970	27	18	69	15	56	12.7	20.6	5.3(16)	9/15-10/5
1971	69[5]	30	48	40	58	12.3	20.6	5.2(24)	9/1-10/5

[1] All male % based on known sex bears.
[2] Length plus width given in feet.
[3] Length plus width given in inches.
[4] Tooth sample size in parentheses.
[5] After compilation of these data, three additional bears were reported from Unit 13. These bears, two males, ages three years and one female age two, all taken by nonresident hunters are not included in these data. Hide size, skull size and ages of these are all noticeably lower than the 1971 figure for these criteria. The total kill for 1971 is thus 72 bears.

Submitted by: Loyal Johnson, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 14 - Anchorage

Seasons and Bag Limits

Sept. 1 - Oct. 5	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The 1971 brown bear harvest in Unit 14 was the highest recorded during the past 11 years. Sixteen animals were harvested by sport hunters (see Appendix I) while no bears were taken for other reasons. The opening of the season 14 days earlier than last year is partially responsible for the increased harvest. Of the bears reported harvested, seven were taken prior to September 15 (the opening date last year). Nine bears were taken after September 15; this represents an increase of 50 percent over last season during the same time period.

The number of bears taken by nonresident hunters (4) is slightly above the past 10-year average of 3.4, while the percentage taken by nonresident hunters (25 percent) is slightly below the past 10-year average of 34 percent.

Nine of the 15 bears (60 percent), for which the number of days hunted were reported, were taken within one or two days of hunting. Excluding the nonresident take, nine out of 11 bears (82 percent) were reported taken within one or two days of hunting.

The hunting pattern for brown/grizzly bears in Unit 14 has changed little during the past few years. It is believed the majority of the bears were taken incidental to hunting for other species.

Eleven (69 percent) of the bears taken in Unit 14 came from the Talkeetna Mountains (most of these from the west slope of the range) and 25 percent (4) came from the Chugach Mountains between Eklutna basin and Ship Creek.

Composition and Productivity

Thirty-eight percent of the bears taken in Unit 14 during 1971 were males. This is below the past 10-year average of 49 percent but compares favorably with the 1961 figure of 43 percent of the 14 bears and the 1968 figure of 30 percent of 11 bears. Due to the erratic nature of these figures during the past ten years and the small sample sizes involved each year, no trend has been established.

Mean hide sizes of males during the period 1961 through 1966 were quite stable, ranging between 12.6 feet in 1961 through 13.5 feet in 1966 (Appendix I), but all sample sizes are low, ranging from 3 to 16. M Mean hide sizes have dropped slightly since 1966, with the exception of three males taken in 1968. The 1971 mean hide size for males was 11.8 feet.

Mean ages of males, based on deposition of cementum layers, have been recorded for four years (Appendix I). The mean age of males in 1971 was 3.5 years based on a sample of six bears. Due to small sample sizes in other years, it is impossible to arrive at meaningful conclusions.

Management Summary and Conclusions

It appears that the increased brown/grizzly bear harvest in Unit 14 is largely due to the opening of the season 14 days earlier than last year. The majority of the bears harvested were probably taken incidental to hunting for other species.

Hide sizes are slightly depressed compared to the period 1961-1966, but due to small sample size cannot be considered significant. Limited data preclude making meaningful conclusions about trends in the ages of harvested bears in Unit 14.

Recommendations

No changes in season or bag limit are recommended at this time. In order to make data comparable for a period of years, seasons should not be changed annually.

Submitted by: Jack C. Didrickson, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 14 - Anchorage

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971. Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961	14	6	43	7	50	12.6			9/1-9/30
1962	8	4	50	0	0	13.1			Same
1963	13	8	67	5	38.4	12.9			Same
1964	12	9	75	1	8	12.9			Same
1965	15	7	47	7	47	12.7			9/1-10/15
1966	5	2	40	2	40	13.5			9/1-9/30
1967	12	6	55	6	50	12.0	21.2		Same
1968	11	3	30	6	55	14.5	22.0	5.7(3)	Same
1969	3	3	100	0	0	11.7	18.7	2.0(3)	9/20-10/20
1970	6	1	17	0	0	11.6	-	2.0(1)	9/15-10/5
1971	16	6	38	4	25	11.8	20.0	3.5(6)	9/1-10/5

[1] All male % based on known-sex bears.
[2] Length plus width given in feet.
[3] Length plus width given in inches.
[4] Tooth sample size in parentheses.

Submitted by: Jack C. Didrickson, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 15 - Western Kenai Peninsula

Season and Bag Limits

Sept. 20 - Oct. 15	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Brown/grizzly bear sealing reports indicate a harvest of three brown bears from Unit 15 during the 1970-71 season (Appendix I). The harvest was composed of two males and one female, and the magnitude of the harvest was similar to that of the 1969-70 season. The level of harvest was 46 percent below the five-year average of 5.6 and 34 percent below the average for the previous 10 years.

Composition and Productivity

Hide and skull size data for this unit are so limited, because of the low level of harvest, that they cannot be analyzed with any degree of confidence.

Management Summary and Conclusions

The harvest of brown bears in this unit has been very low since the season was changed from Sept. 1-30 to Sept. 20 - Oct. 15 in 1970. A higher level of harvest could be sustained in this unit with no adverse affect on the bear population.

Recommendations

The hunting season should begin five days earlier in September to allow a slight increase in harvest.

Submitted by: Paul LeRoux, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 15 - Western Kenai Peninsula

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961	4	2	50	0	0	18.6			9/1-9/30
1962	5	2	40	3	60	11.5			Same
1963	4	2	50	0	0	12.8			Same
1964	2	2	100	2	100	12.9			Same
1965	3	1	33	1	33	13.2			Same
1966	4	1	25	1	25	17.3			Same
1967	4	2	50	1	25	15.5	24.5		Same
1968	11	7	64	1	9	14.5	25.1	2.0(2)	Same
1969	6	4	67	0	0	14.3	24.8	7.0(2)	Same
1970	3	2	67	1	33	15.3	26.3	8.0(1)	9/20-10/15
1971	3	2	67	0	0	12.4	19.6	3.0(1)	9/20-10/15

[1] All male % based on known-sex bears.
[2] Length plus width given in feet.
[3] Length plus width given in inches.
[4] Tooth sample size in parentheses.

Submitted by: Paul LeRoux, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 16 - West side of Cook Inlet

Seasons and Bag Limits

Sept. 1 - Oct. 15	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The brown/grizzly bear harvest in Unit 16 was 42 animals (Appendix I). This was the largest harvest reported in 11 years. The trend in the harvest has been upward since 1968.

Of 39 animals for which the date of harvest is currently available, eight or 20.5 percent were taken in the spring season.

As shown in Appendix 1, the percentage of nonresidents participating in the harvest (48 percent) is lower than 1970 (68 percent) but is comparable to the period 1963-1966 when the percentage of nonresidents taking bear in Unit 16 ranged from 41 percent to 52 percent. It is probable that nonresident hunters accompanied by a guide are more selective in choosing a bear than a resident, and thus take larger and older bears.

Composition and Productivity

The percentage of males in the harvest, mean hide size of males, mean skull size of males, and mean cementum age of males have been on a downward trend since 1968. The percentage of males rose to 79 percent in 1970, but mean age of males dropped from a high of 8.1 years in 1967 and 1968 to 5.1 years in 1971.

The mean hide size of 12.7 feet in 1971 is similar to the average mean hide size from 1961 through 1964.

Management Summary and Conclusions

Recent harvest information reveals that brown/grizzly bears in Unit 16 are being harvested more heavily than in the past. Complex bear camp registration requirements in neighboring Unit 9 which are not required in Unit 16, and the close proximity of Unit 16 to the rapidly expanding Anchorage population may be responsible for this trend. The age structure and hide size of male bear harvested will be monitored closely in the future, because the general trend in the past four years is downward.

Recommendations

No season or bag limit changes are recommended at this time. If seasons remain unchanged, a continuing trend in decreasing age structure may ultimately result in a request to manipulate seasons to decrease harvest.

Submitted by: Jack C. Didrickson, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 16 - West Side of Cook Inlet

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males[1]	No. Nonres.	% Nonres.	Mean Hide Size Male[2]	Mean Skull Size Male[3]	Mean Cem. Age Male[4]	Calendar Year Seasons
1961	28	12	43	18	64	13.0			5/15-6/15 9/1-12/31
1962	18	9	50	10	83	12.1			Same
1963	27	18	69	11	41	13.0			Same
1964	20	13	65	9	45	12.7			Same
1965	37	22	73	19	51	13.5			Same
1966	27	11	42	14	52	13.3			Same
1967	28	13	50	19	68	14.4	23.1	8.1(10) Fall	Same
1968	23	16	70	16	70	14.5	23.3	8.1(14)	Same
1969	37	23	62	17	46	14.2	22.7	7.0(21)	5/15-6/15 9/1-10/15
1970	40	31	79	27	68	13.6	22.6	7.5(28)	5/15-6/10 9/1-10/15
1971	42	21	53	20	48	12.7	21.0	5.1(18)	5/15-6/10 9/1-10/15

[1]/All male % based on known-sex bears.
[2]/Length plus width given in feet.
[3]/Length plus width given in inches.
[4]/Tooth sample size in parentheses.

Submitted by: Jack C. Didrickson, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 17 - Bristol Bay

Seasons and Bag Limits

Spring Season	May 15 - June 10	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Fall Season	Sept. 1 - Oct. 15	

Harvest and Hunting Pressure

The 1971 spring and fall seasons produced a reported harvest of 33 brown bears from Unit 17. This is the largest reported harvest in the unit's history (Appendix I). The harvest occurred primarily in the fall--26 of the 33 brown bears. As in past years, successful hunters were predominantly nonresidents (79 percent). Twenty-one or 64 percent of the bears taken were males. Male skull sizes are presented in Appendix II.

Composition and Productivity

No information available.

Management Summary and Conclusions

The increased harvest of bears in Unit 17 over the past two years is the result of more restrictive seasons in the adjoining Unit 9. With both the spring and fall seasons being more liberal and not running concurrently with Unit 9's seasons, there has been shift of effort into Unit 17 by some guides who normally hunt in Unit 9. Undoubtedly not all bears reported for Unit 17 were taken within the unit. The magnitude of this discrepancy in bears presented for sealing is not known.

Recommendations

No changes in seasons or bag limits are recommended. However, if Unit 17 continues to show increased harvest, its seasons should be set to coincide with those of Unit 9.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 17 - Bristol Bay

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Calendar Year	Total Kill	No. Males	% Males	No. Nonres.	% Nonres.	Mean Hide Size Male[1]	Mean Skull Size Male[2]	Mean Cem. Age Male[3]	Calendar Year Season
1961	2	1	50	0	0	13.7			5/15-6/15 9/1-12/31
1962	2	2	100	0	0	15.5			Same
1963	3	1	33	0	0	16.3			Same
1964	5	2	40	4	80	11.5			Same
1965	6	2	33	5	83	13.3			Same
1966	9	4	50	4	44	14.1			Same
1967	11	3	27	10	91	14.8	22.5		Same
1968	10	7	70	6	60	13.6	23.4	7.3(3)	Same
1969	5	2	40	3	60	15.3	23.2	8.5(2)	5/15-6/15 9/1-10/15
1970	23	12	55	20	87	14.7	23.0	6.4(11)	5/15-6/10 9/1-10/15
1971	33	21	66	26	79	14.1	23.2	6.4(17)	5/15-6/10 9/1-10/15

[1] Length plus width given in feet.
[2] Length plus width given in inches.
[3] Tooth sample size in parentheses.

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR - GMU 17 - Bristol Bay

APPENDIX II

Average Male Brown/Grizzly Skull Size Recorded in Inches, and by Year, Season and Residency of Hunter for Unit 17.

	SPRING				FALL				TOTAL		
	Resident		Nonresident		Resident		Nonresident				
Year	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	Sample Size %
1967	-	-	-	-	-	-	2	22.5	2	22.5	100
1968	2	23.5	-	-	1	20.8	2	24.6	5	23.4	71
1969	1	23.5	-	-	-	-	1	22.8	2	23.2	100
1970	0	0	4	25.4	1	19.6	7	22.1	12	23.0	100
1971	0	0	5	25.6	3	21.4	10	22.6	18	23.2	86

Submitted by: James B. Faro, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 18 - Yukon-Kuskokwim Delta

Seasons and Bag Limits

Sept. 1 - Nov. 30	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Six bears were reported taken in 1971, compared to one bear in 1970. Four of the six bears were males taken by nonresident hunters; one additional male was taken by a resident. While the harvest of brown/grizzly bears in Unit 18 is very small, the proportion taken by nonresident sport hunters is a good indication that guides consider it worthwhile to travel as far as Unit 18 for bears. The annual take will probably continue upward.

Composition and Productivity

No surveys were undertaken. Reports of bears and areas with concentrations of bears were recorded. Data on sex, age and size of bears killed and reported are given in Appendix I.

Management Summary and Recommendations

General distribution and relative abundance surveys are needed. Increased hunting pressure should be anticipated, with regulations proposed accordingly. Results of the 1972 spring season should be carefully evaluated. No change is recommended in regulations at this time.

Submitted by: Richard Bishop, Game Biologist IV

BROWN/GRIZZLY BEAR

APPENDIX I

Sex, age and size of grizzly bears shot in Units 18, 19 and 21, 1971

	Unit 18			Unit 19			Unit 21		
	Spring	Fall[1]	Total	Spring	Fall	Total	Spring	Fall	Total
Total Kill	NO SEASON	6		9	19	28	NO SEASON	2	2
% Male in Harvest[2]		83		100	56	72		100	100
% Harvest by Nonresidents		67		67	84	79			
Mean Hide Size (M) (Ft.)		14.9(4)		15.4(9)	12.6(9)	14.0(18)		14.9(2)	14.9(2)
Mean Hide Size (F) (Ft.)		13.0(1)			11.7(7)	11.7(7)			
Mean Hide Size, Sex Unknown (Ft.)					11.0(3)	11.0(3)			
Mean Hide Size, All Bears (Ft.)[3]		14.5(5)		15.4(9)	12.2(19)	13.4(25)		14.9(2)	14.9(2)
Mean Skull Size (M) (In.)		23.9(4)		25.0(9)	22.8(17)	22.8(17)		23.2(2)	23.2(2)
Mean Skull Size (F) (In.)		21.9(1)			19.6(6)	19.6(6)			
Mean Age (M) (Yr.)		9.2(5)		11.2(6)	4.4(8)	7.3(14)		12(1)	12(1)
Mean Age (F) (Yr.)		3.0(1)			7.3(6)	7.3(6)			

[1] Sample sizes in parenthesis.
[2] Based on known sex bears killed.
[3] Including unknown sex bears.

Submitted by: Richard Bishop, Game Biologist IV

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 19 - McGrath

Seasons and Bag Limits

May 15 - June 10 Sept. 1 - Oct. 15	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Hunting pressure in this unit is light but it is increasing as additional guides move into the area. In 1971 the known harvest of bears was 28, compared to 17 in 1970. Sixty-four percent of the 1971 kill was males, and 79 percent of the bears were taken by nonresidents. The trend toward higher harvests is expected to continue.

At present, most bears are killed by guided hunters in the Alaska Range. Some hunting by local residents occurs in various areas; a few of the bears are shot in defense of life and property, and some are unreported. Guided hunts are expected to become more frequent in other parts of Unit 19.

Composition and Productivity

No surveys were done in 1971. Observations and reports of bears were recorded. Sex, age and size data from bears killed and reported are given in Appendix I of the report for Game Management Unit 18.

Management Summary and Recommendations

Changes in seasons and bag limits are not recommended at this time. Effective enforcement will be needed to limit illegal hunting, and regulations to control total take will ultimately be required.

Submitted by: Richard Bishop, Game Biologist IV

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 20 - Fairbanks, Central Tanana

Seasons and Bag Limits

Subunits 20A, 20B and 20C	Sept. 15 - Oct. 5	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The legally reported sport kill in Unit 20 during 1971 was 30 bears, five more than reported in 1970. The harvest in 1971 was the fifth largest since 1961 and is twice the lowest reported harvest of 1967 (Appendix I).

The percent of males in the harvest in 1971 was 52 percent, a decrease of 22 percent since 1968 when 74 percent of the reported kill was males.

Nonresident hunters harvested 47 percent of the bears during the 1971 season, the highest nonresident kill percent in 11 years and well above the 10-year average harvest of 26 percent by nonresidents. This is partially explained by the absence of a spring season in 1971, which reduced the resident harvest in most of the unit.

Appendix II lists the variation in spring vs. fall harvests since 1961 in Unit 20, a reflection of hunting effort by both guided nonresidents, and residents who take bears incidental to hunting for other big game species in the fall. Spring harvests rarely exceed one-half the fall take, and the 10-year average harvest of 7.9 bears in spring shows a marked variation from the 10-year fall average harvest of 23.2 bears.

Analyses of sealing records in the Fairbanks office (where 22 of the 30 bears were sealed in 1971) indicate that six bears (2 males, 2 females and 2 sex unknown) were taken in the Alaska Range in Unit 20A, 13 bears (5 males, 8 females) were taken in the Alaska Range in Unit 20C, and one male bear was taken in the Alaska Range in Unit 20D, indicating the relatively small portion of huntable bear habitat in Unit 20 which supports the majority of the harvest.

Composition and Productivity

No surveys were undertaken. Data on sex, age and size of bears killed and reported are given in Appendix I. Mean hide size of male

bears was 11.4 feet in 1971, a decrease from the 10-year average of 13.1.

A corresponding decrease is found in skull size of male bears (18.6 inches) taken in 1971, which has decreased from the four-year average of 21.4 dating back to 1967 when skull measurements were first recorded (Appendix III).

The average age of male bears taken during the 1971 season was 6.1 years, a slight decrease from 6.6 recorded in 1970, but a marked decline from 9.2 in 1969 (Appendix I).

Management Summary and Recommendations

Examination of harvest data indicates a decreasing average male hide size, smaller average male skull size, younger age of males and a declining percent of males in the harvest reflecting a decrease in mature adults available in the population and overutilization of the huntable bear population in Unit 20.

Undocumented variables, such as higher productivity and/or survival (resulting in more younger bears available for harvest) may bias the data supporting the above discussion. However, restrictions to maintain a trophy bear population, or at least a harvestable surplus, are needed. Biologically, the bear population in Unit 20 appears to be affected by the current level of harvest (decrease in age and size of male bears killed). Elimination of the fall season, at least in subunits encompassing the Alaska Range, will reduce hunting pressure, but may result in nonsport harvests of bears shot in defense of life and property in the heavily-hunted areas of the north side of the Alaska Range in fall. A compromise in the maintenance of a spring and fall season in 20B and a shortening of a fall-only season in 20A and 20C would probably achieve a more desirable level of harvest.

Submitted by: Mel Buchholtz, Game Biologist II

BROWN/GRIZZLY BEAR - GMU 20 - Fairbanks, Central Tanana

APPENDIX I

Brown/grizzly Bear Sport Harvest, Calendar Years 1961 through 1971: Participation by Nonresidents in the Bear Harvest with Mean Hide, Skull Size and Cementum Age of Male Bears Presented for Sealing.

Year	Total Kill	No. Males	% Males	No. Nonres.	% Nonres.	Mean Hide Size Male	Mean Skull Size Male	Mean Cem. Age Male*	Regulatory Year Seasons
1961	17	12	71	4	24	13.0			9/1-12/31 5/15-6/15
1962	26	16	62	5	19	12.6			Same
1963	44	25	57	7	16	12.4			Same
1964	46	28	64	15	33	13.0			Same
1965	32	18	56	11	34	13.7			Same
1966	57	28	50	22	39	13.2			A9/1-12/31 B&C 9/1-12/31 5/15-6/15
1967	15	6	40	2	13	13.3	21.3		A 9/15-12/31 B&C 9/15-12/31 5/15-6/15
1968	23	17	74	5	22	13.4	22.2	15.2(5)	A 9/15-10/15 B&C 9/15-12/31 5/15-6/15
1969	26	15	58	7	27	13.0	20.9	9.2(14)	A 9/20-10/20 B&C 9/1-30 5/15-6/15
1970	25	15	61	7	30	13.3	21.2	6.6(14)	A 9/15-10/5 B&C 5/15-6/10 9/15-10/15
1971	30	12	52	14	47	11.4	18.6	6.1(11)	A,B&C 9/15-10/5

* Tooth sample size in parenthesis.

Submitted by: Mel Buchholtz, Game Biologist II

BROWN/GRIZZLY BEAR - GMU 20 - Fairbanks, Central Tanana

APPENDIX II

Grizzly Bear Sport Harvest by Season

Year	Spring	Fall
1961	6	11
1962	4	22
1963	10	34
1964	5	41
1965	17	15
1966	12	45
1967	4	11
1968	5	18
1969	7	19
1970	9	16
1971	-	30

Submitted by: Mel Buchholtz, Game Biologist II

BROWN/GRIZZLY BEAR - GMU 20 - Fairbanks, Central Tanana

APPENDIX III

Average Male Brown/Grizzly Skull Size Recorded in Inches and by Year, Season and Residency of Hunter

	SPRING				FALL				TOTAL		
	Resident		Nonresident		Resident		Nonresident				
Year	No.	Size	No.	Size	No.	Size	No.	Size	No.	Size	Sample Size %
1967	-	-	-	-	3	21.2	1	21.3	4	21.3	67
1968	1	23.8	2	25.4	7	21.9	3	20.0	13	22.2	76
1969	3	21.2	1	19.9	6	22.0	3	18.7	13	20.9	87
1970	1	17.3	1	19.9	4	21.5	5	22.0	11	21.2	73
1971	NO SEASON				6	18.0	3	19.9	9	18.6	75

Submitted by: Mel Buchholtz, Game Biologist II

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 21 - Middle Yukon

Seasons and Bag Limits

Sept. 1 - Nov. 30	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Two grizzlies were reported killed in Unit 21. This is an underestimate resulting from noncompliance with regulations on sealing and on reporting bears shot because they constituted a threat to life or property. Nevertheless, the take of grizzlies in Unit 21 was very low, and probably did not exceed 15. Several areas of Unit 21 support moderate to high grizzly populations but are seldom hunted.

Composition and Productivity

Surveys have not been done in Unit 21. Reports of bears and of areas supporting relatively abundant bear populations have been recorded. Sex, age and size data from bears killed and reported are given in Appendix I of the report for Game Management Unit 18.

Management Summary and Recommendations

No changes in regulations are recommended. Hunting pressure will increase in Unit 21 as guides and resident hunters look for new hunting areas. Composition and relative abundance surveys should be conducted, and effective regulations for controlling harvests should be devised.

Submitted by: Richard Bishop, Game Biologist IV

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 22 - Seward Peninsula

Season and Bag Limits

Sept. 1 - Nov. 30	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Harvest of bears in this unit continues to be low. Two bears, one female and one male, were reported taken in 1971. The average reported harvest for the last 10 years has been two bears a year.

Composition and Productivity

No surveys were undertaken. Data on age and size of bears have not been analyzed. Considering the size of the harvest it is unlikely that inferences could be made about the bear population.

Management Summary and Recommendations

Bears are not uncommon in this unit, however, there is little interest in hunting them in the fall.

Each year the Department receives complaints of depredation by bears on reindeer during the fawning period in the spring. Local residents indicate that they would rather take bears in the spring when the bears are better eating. Since the harvest is low a spring season would allow the taking of the limited number of bears involved in reindeer depredation, and allow the harvest of bears when they are considered to be in prime condition and more palatable by local residents. Only 12 bears were reported taken during nine prior spring seasons.

Submitted by: Robert E. Pegau, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 23 - Kotzebue Sound

Season and Bag Limit

Sept. 1 - Nov. 30	One bear every four regulatory years; provided the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

Harvest in this unit has varied from six in 1961 and 1962 to a high of 29 in 1968. In 1971 the reported harvest was seven males and six females, with six bears taken by residents and seven by nonresidents.

Composition and Productivity

No surveys were undertaken. Data on age and size of bears have not been analyzed. Considering the size of the reported harvest it is unlikely that inferences could be made about the bear population.

Management Summary and Recommendations

The fall harvest remains relatively high. Sport hunting of bears only by nonresidents is becoming more common as other units become more restrictive. Local residents still harvest bears primarily in conjunction with moose hunting. It is recommended that season and bag limit remain unchanged.

Submitted by: Robert E. Pegau, Game Biologist III

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 24 - Koyukuk

Season and Bag Limit

No Open Season

Harvest and Hunting Pressure

No reported harvest occurred in 1971. In 1970, 17 bears were sealed, which was nearly a 50 percent increase over the previous year. The unreported harvest probably exceeded this figure. Hunting pressure is rapidly increasing north of the Yukon and we can expect a substantial increase in pressure when the season reopens.

Composition and Productivity

No information is available.

Management Summary and Recommendations

Without adequate enforcement, the effectiveness of regulating the harvest by setting season lengths and timing is severely limited. There is a long period of time when bears are available to illegally operating ski-equipped aircraft.

Without enforcement of the sealing regulation, information from the substantial unreported harvest by residents of the area is lost.

I believe the combination of both these sources of illegal, unreported harvest annually exceeds the reported harvest, and therefore considerably dilutes the usefulness of the reported harvest data.

Game Management Units 23, 24, 25 and 26 should have uniform seasons, at least until we achieve the ability to exert significant enforcement pressure to allow different seasons. Until then, different season lengths, dates, and bag limits among these units will primarily discriminate against legitimate hunters.

Submitted by: Spencer Linderman, Game Biologist II

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 25 - Fort Yukon

Season and Bag Limit

No Open Season

Harvest and Hunting Pressure

Two male grizzlies shot in defense of life and property were reported in 1971. The bears were similarly sized and skulls averaged 19.4 inches. In 1970, 13 bears were sealed, nearly the same reported harvest as the previous year. The unreported harvest probably exceeded this figure. Hunting pressure is rapidly increasing north of the Yukon and we can expect a substantial increase in pressure when the season reopens.

Composition and Productivity

No information is available.

Management Summary and Recommendations

Without adequate enforcement, the effectiveness of regulating the harvest by setting season lengths and timing is severely limited. There is a long period of time when bears are available to illegally operating ski-equipped aircraft.

Without enforcement of the sealing regulation, information from the substantial unreported harvest by residents of the area is lost.

I believe the combination of both these sources of illegal, unreported harvest annually exceeds the reported harvest, and therefore dilutes considerably the usefulness of the reported harvest data.

Game Management Units 23, 24, 25 and 26 should be uniform seasons, at least until we achieve the ability to exert significant enforcement pressure to allow different seasons. Until then, different season lengths, dates and bag limits among these units will primarily discriminate against legitimate hunters.

Submitted by: Spencer Linderman, Game Biologist II

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 26 - Arctic Slope

Seasons and Bag Limits

Unit 26(A)	Sept. 1 - Nov. 30	One bear every four regulatory years; provided that the taking of cubs or females accompanied by cubs is prohibited.
Unit 26(B)	NO OPEN SEASON	
Unit 26(C)	NO OPEN SEASON	

Harvest and Hunting Pressure

The reported 1971 sport harvest of grizzly bear in Unit 26(A) was 23 bears. Thirteen were males, nine females and one sex unknown. The harvest reported during the previous five years ranged from 4 to 16 bears. During 1971 approximately 40 percent of Game Management Unit 26 was closed to hunting, and therefore the increase in number of bears harvested represents an even greater increase in hunting pressure per unit area. The majority of all bears reported since 1961 have been killed in the central Arctic [eastern 26(A)]. There are still some bears killed which are unsealed.

Composition and Productivity

Three samples available reflect composition. Of 167 bears observed during 1971 surveys, 9 percent were females accompanied by young, 19 percent were cubs and yearlings and 72 percent were solitary adults. Of 23 bears tagged during 1971, 12 bears were male (mean cementum age - 11.1 years) and 11 bears were female (mean cementum age - 10.8 years). Of the 23 bears harvested, 13 bears were male, nine bears were female and one unknown sex.

Based on observed percent of cubs and yearlings in the population and yearling litter size, annual recruitment into the adult population was 10 percent in 1971 compared to 12 percent in 1970. No estimate of total numbers of bears in Game Management Unit 26 is yet possible, but the density of bears observed is in the range of one bear per 100 square miles.

Management Summary and Recommendations

It is recommended that Game Management Units 23, 24, 25 and 26 have coincident brown bear hunting seasons. It is further recommended that this hunting season occur May 25 - June 10. There is no known biological reason for the closure of Subunits 26(B) and 26(C) and they should be opened to hunting as an aid in distributing hunting pressure.

Submitted by: J. Lynn Crook, Game Biologist II (Temporary)

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 7 and 15 - Kenai Mountains

Seasons and Bag Limits

Unit 7 that portion bounded on the northwest by the Sterling Highway, on the northeast and east by the Anchorage-Seward Highway, on the south and southwest by Kenai Lake.	Aug. 10 - Sept. 20	One sheep with 1/2 curl horn or less; 100 sheep of either sex may be taken by permit only. Dates and conditions will be described by Commissioner's announcement.
Remainder of Unit 7	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger
Unit 15	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger

Harvest and Hunting Pressure

Based on harvest report returns the ram harvest and hunting pressure in the Kenai Mountains (KMR) since 1967 was as follows:

	All Hunters			Residents			Nonresidents		
		No.			No.			No.	
Year	Kill	Hunters	Success	Kill	Hunters	Success	Kill	Hunters	Success
1967	68	358	19%	56	335	17%	12	23	52%
1968	104	469	22%	86	447	19%	18	22	82%
1969	73	383	19%	60	362	17%	11	15	73%
1970	65	300	22%	45	241	19%	8	18	44%
1971	34	272	13%	31	251	12%	3	16	19%

Two hundred and seventy-two hunters reported hunting the Kenai Mountains in 1971. Hunters afield dropped 9.3 percent from 1970 while hunter success dropped by 47.7 percent. The exact cause for the severe drop in hunter success is not known; however, rainy weather during the sheep season was probably an important factor.

Composition and Productivity

Recent research findings indicate significant error in identifying

legal rams and separating young rams and ewes on aerial surveys. As a result, sex and age composition and productivity count data established in previous reports are not presented here.

Total counts of sheep have been made on four areas in the Kenai Mountains since 1968. Data obtained are as follows:

Year	Cooper Mountain	Crescent Lake Mountains	Grant Lake Mountains	Surprise Mountain
1956	50	136	No counts	No counts
1968	117	No counts	43	275
1969	76[1]	No counts	57	No counts
1970	No counts	287	62	185
1971	No counts	228[2]	51[3]	179

[1] Incomplete count due to inclement weather.
[2] Sixty-two sheep were removed during the period between 1969 and 1970 counts for research purposes.
[3] No adult rams seen indicating some animals were probably missed.

Management Summary and Conclusions

Results of total counts indicate upward trends on all trend count areas through 1968. Limited data collected since 1968 suggest a continued slight upward trend on Crescent Mountain if the 62 sheep removed for research purposes are added to the 1971 counts. The Grant Lake trend count unit shows a decline between 1970 and 1971; however, it is believed that most of the legal ram segment of the herd was missed on the 1971 census. Winter die-off resulted in a net reduction of 33 percent in the Surprise Mountain herd during the winter of 1969-1970. Another very slight drop in numbers occurred between 1970 and 1971. No trend is evident on Cooper Mountain as good counts have not been made since 1968.

The overall management implications of these data are not clear; however, it appears that winter losses on Surprise Mountain were the result of more sheep on the range than the range could support. If this is true other areas may be approaching this same situation or may now have over-populations. Data from at least two more years are needed to establish a good picture of sheep trends in these count areas.

The hunting effort and harvest have been declining since 1968. The downward trend in the harvest may be due to fewer legal rams available for harvest, resulting from lower production and survival. This in turn could indicate that the sheep population exceeded the level of maximum productivity prior to 1968. Research presently being carried out in the Kenai Mountains will provide better insight on this possibility in the next four years.

The reason for the decline in hunting effort can only be speculated upon. Since the hunter success has been low (from 12 to 19 percent) and large rams are seldom taken, hunters may be directing their efforts to areas where success runs higher and larger rams are available.

Recommendations

No changes are recommended. The established limited ewe season should be retained for research purposes.

Submitted by: Paul A. LeRoux, Game Biologist III.

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Parts of GMU's 9, 16, 17 and 19 - Alaska Range West (ARW)

Seasons and Bag Limits

Units 9, 16, 17 and 19	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Alaska Range West from 1967-1971 are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1967	65	97	67	-
1968	95	151	63	33.7 (n=52)*
1969	105	155	68	35.0 (n=95)*
1970	84	162	52	34.0 (n=81)*
1971	71	156	46	34.1 (n=66)*

* n = number of sets of horns in sample.

The number of sheep harvested in the Alaska Range West has not shown any marked trends in the last five years and the number of hunters has not changed significantly in the last four years. The hunter success ratio has decreased by approximately 30 percent from 1967 to 1971. Examination of the harvest information on a drainage basis indicates that hunting pressure is not distributed throughout the range and that a few areas have traditionally supported a major portion of the kill. The Rainy Pass area, Twin Lakes, Windy Fork on the Kuskokwim River, the Tonzona River and the Farewell area have sustained more than 60 percent of the kill for the past four years. In these areas it is possible that hunting has removed a major portion of the available rams. The decreased availability of rams in the heavily hunted areas may account for the decreasing success ratio.

In the Alaska Range West, approximately 60 percent of all hunters are residents and they take 40 to 50 percent of the harvest.

Composition and Productivity

No information was gathered on herd composition and productivity in 1971.

Management Summary and Recommendations

With our limited knowledge of sheep hunters, hunting conditions and sheep composition and productivity in this area, it is difficult to explain the variations in the above figures. While the generally decreasing harvest and decreasing success ratio might indicate a decrease in ram abundance, these figures might simply be indicative of less skilled hunters, hunters with too little experience in the area or possibly poorer weather conditions in recent years. Considering the abundant sheep habitat in the Alaska Range West it is not likely that the harvest in recent years has significantly altered the sex ratios in general. It appears, however, that in localized areas a significant proportion of the trophy rams may have been removed by hunting.

Information on sheep composition and productivity should be gathered on an annual basis and it is, therefore, recommended that a trend count area be established in the Alaska Range West.

It is further recommended that surveys of distribution and abundance be completed in this mountain range. Without this infomation it is impossible to analyze harvest information in relation to the total abundance and distribution of sheep in this area.

The greatest present use of this sheep population is as a source of trophy sheep. No changes in the regulations regarding trophy rams are recommended.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. Regulations should be considered that would allow the harvest of ewe sheep and also increase the hunting and recreational opportunity. The sheep population in this area has probably not undergone the severe composition changes that have occurred on other ranges; therefore, management techniques should be initiated to prevent these undesirable changes. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep, but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should allow for the continued harvest of trophy rams.

Submitted by: Arthur C. Smith, Game Biologist II

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - South side of Wrangell Mountains and eastern portion of Chugach Mountains

Seasons and Bag Limits

Unit 11	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger

Harvest and Hunting Pressure

Harvest report returns since 1962 have shown the kill of rams to be as follows:

1962* - 117	1967 - 149
1963 - 131	1968 - 215
1964 - 151	1969 - 157
1965 - 131	1970 - 171
1966 - 125	1971 - 178

*1962 was the first year of the harvest ticket report. Coverage is known to have been incomplete.

Composition and Productivity

No data gathered during reporting period.

Management Summary and Conclusions

The trend of the harvest has shown a slight but steady increase over the past ten years. Casual observations in the Wrangell Mountains have shown increasing interest there, such as new guides working the area, newly constructed landing areas and camps and increased interest by resident hunters. There is also a considerable resurgence of mining activity, especially in the McCarthy area. However, because of their ruggedness, mangitude and as yet relatively undeveloped access, the Wrangell Mountains should be able to provide top quality hunting for trophy sheep for many years to come.

Recommendations

No changes recommended at this time.

Submitted by: Loyal Johnson, Game Biologist III

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 12 - Northern portion of Wrangell Mountains

Seasons and Bag Limits

Unit 12	Aug. 10 - Sept. 20	One ram with 3/4 curl or larger

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for Unit 12 are given below:

Year	Sheep Harvest	No. of Hunters	Success Percent	Mean Horn Length
1967	119	-	-	31.9 (119)*
1968	107	246	43	34.5 (107)*
1969	122	235	52	33.6 (117)*
1970	124	247	50	34.4 (116)*
1971	182	341	53	35.6 (169)*

*n = number of sets of horns in sample.

The number of hunters and the harvest of sheep within that portion of Unit 12 in the Wrangell Mountains increased by 38 percent and 47 percent, respectively, from 1970 to 1971. The success ratio for all hunters was slightly above 50 percent, with approximately 40 percent of the residents and 80 percent of the nonresidents being successful. In this unit, approximately 75 percent of all hunters are residents and they take approximately 65 percent of the harvest.

A significant portion of the annual harvest (45%) has come from the Nabesna River drainages with the remainder of the kill being fairly evenly distributed among the other drainages.

Composition and Productivity

No composition or productivity information has been gathered from the sheep of Unit 12 during this report period. Several abundance and distribution flights, however, have been flown in this area in past years.

Robert Scott, in 1949, flew the sheep range from the Nabesna Pass to the Canadian border in a 165 h.p. Stinson. Frank Jones flew the area in a 150 h.p. Piper Supercub in 1962 and 1967. Lyman Nichols flew most of the Unit 12 Wrangell Mountain sheep country east of the Nabesna River

drainage in 1968. The results of these counts are presented in Table 1.

Table 1. Results of sheep counts in Wrangell Mountains, Unit 12.

Date	Personnel	Drainages Surveyed	Sheep Observed
9/23-24/1949	R. Scott (USFW)	Nabesna Pass, Nabesna River, Chisana River, Stuver Creek, Upper White River, Tim Creek, and Ptarmigan Lake	497
7/14-17/1962	Frank Jones (ADFG) Sam Snyder (ADFG)	Nabesna River, Chisana River, Upper White River, Skolai Pass, Ptarmigan Lake, and Rock Lake	1298
8/5-7/1967	Frank Jones (ADFG) Bill Griffin (ADFG)	Nabesna River, Chisana River, Headwaters of White River	2198
6/25-28/1968	Lyman Nichols (ADFG)	Headwaters of White River, Mt. Sulzer, Mt. Natazhat, Ptarmigan Lake area	1298

Unfortunately these surveys are not comparable and maps are not available indicating the flight routes. Nonetheless, the surveys do indicate that sheep occur throughout the Wrangell Mountains of Unit 12. There may also be some indication that the number of sheep has increased since the first surveys of 1949.

Management Summary and Recommendations

No changes in the regulations regarding trophy rams are recommended.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. It is recommended that consideration be given to regulations that would allow the harvest of a limited number of ewe sheep. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep, but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should allow for the continued harvest of trophy rams.

Considering the increasing hunter interest, it is further recommended that some system of monitoring the sheep population (i.e. production and survival of lambs and availability of legal rams) be designed and initiated in this area.

Submitted by: Arthur C. Smith, Game Biologist II

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Parts of GMU's 12, 13 and 20 - Alaska Range East of McKinley Park (ARE)

Seasons and Bag Limits

Unit 12, 13 and 20*	Aug. 10 - Sept. 20	One ram with 3/4 curl or larger
*Unit 20 that portion known as Delta Management Area	Aug. 10 - Sept. 20**	One ram with 3/4 curl or larger

**From 12:01 a.m., August 5 to 12:01 a.m., August 26 no motorized vehicles nor pack animals may be used to transport hunters, hunting gear or game within the Delta Management Area.[1]

[1] Due to a different management plan in the Delta Management Area, the survey and inventory report for this area follows the Alaska Range East report.

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Alaska Range East from 1967-1971 are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1967	120	310	39	-
1968	192	578	33	33.7 (n=142)*
1969	166	486	34	33.5 (n=154)*
1970	211	515	41	33.9 (n=201)*
1971	230	712	32	33.9 (n=221)*

* n = number of sets of horns in sample.

The reported sheep harvest in the Alaska Range East has increased by 92 percent since 1967 (120 to 230). The number of hunters has increased by 129 percent (310 to 712) during the same period. Examination of the harvest information on a drainage basis indicates that the increased kill has come from areas where pressure has been light in the past rather than from areas which formerly supported a major portion of the kill.

Although the 1971 harvest was distributed over more drainages than in the past, several areas continue to support a major portion of the

kill. The Healy-Yanert-Moody Creek area, the Wood River-Dry Creek area, and the Delta Management area support approximately 20, 30 and 25 percent, respectively, of the kill.

With the exception of the 1970 season the success ratio has decreased slightly from 1967 to 1971 (39-32%). The number of days spent hunting until a sheep was killed has increased from 3.9 in 1967 to 4.3 in 1971. In 1970 when the success ratio was 41 percent the average successful hunter spent 5.0 days hunting until the sheep was killed. This may partially explain the higher success ratio of that year.

Variations in mean horn length are probably not significant.

In the Alaska Range East about 75 percent of all hunters are residents and they take approximately 65 percent of the harvest.

Composition and Productivity

Lamb:ewe and yearling:ewe ratios for 1967-1971 in the central Alaska Range East (Dry Creek area) are presented below:

Year	Lamb:ewe	Yearling:ewe
1967 (June)	42:100	11:100
1968 (June)	63:100	13:100
1969 (June)	64:100	31:100
1970 (June)	55:100	31:100
1971 (June)	50:100	51:100

Lamb production has been high from 1967-1971. Survival of lambs to yearling age has increased from 1967 through 1971. A ground count in October of 1971 indicated that survival of this year's lamb crop (50:100) to yearling age will be less than the past several years.

The percentages of legal rams in the population in the central Alaska Range East for 1962, 1964 and 1967-1971 are shown below:

Year	% Legal Rams in Populations
1962	12.3 (n=1436)*
1964	12.5 (n=589)*
1967	9.0 (n=1580)*
1968	8.0 (n=590)*
1969	9.0 (n=220)*
1970	5.7 (n=1347)*
1971	3.0 (n=1031)*

*n=number of sheep in sample.

The variation in techniques used to gather the above figures decreases their reliability. Nonetheless, the indicated decrease is significant. Increasing harvests and known lowered yearling survival in 1967 and 1968 have contributed to this decrease.

Management Summary and Recommendations

The sustainable harvest of trophy rams from the Alaska Range East is unknown. Considering variations in known legal ram abundance, productivity and distribution of hunters, it seems unlikely that the Alaska Range East can sustain a significantly higher kill than it did in 1971. The increase in the number of hunters, the decrease in the success ratio, the increasing length of the hunt and the decrease in the percentage of legal rams all indicate a decrease in the abundance of legal rams.

We have, nonetheless, maintained a harvest in excess of 150 sheep from a specific sex and age segment of the population (i.e. legal rams) for the past four years. At best, this segment makes up only 10 percent of the total population. This leaves us then with 90 percent of the population that we are not utilizing. At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. In fact, evidence available from Surprise Mountain on the Kenai Peninsula and other sheep ranges throughout this state and areas of Canada indicates that the supply of trophy rams will decrease if other segments of the population are not maintained below the carrying capacity of the range. If allowed to exceed this capacity productivity of the female segment will decrease and the supply of young rams will thus be reduced.

Although productivity of the Alaska Range East sheep has generally been high in recent years, it is unlikely that this will continue. Regulations should be considered that would allow the controlled harvest of ewe sheep and also increase hunting and recreational opportunity. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep, but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should also allow for the continued harvest of trophy rams.

Part of GMU 20 - Delta Management Area

Season and Bag Limits

Unit 20	Aug. 10 - Sept. 20*	One ram with 3/4 curl or larger

*From 12:01 a.m., August 5 to 12:01 a.m. August 26 no motorized vehicles nor pack animals may be used to transport hunters, hunting gear or game within the Delta Management Area.

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Delta Management Area from 1968-1971 are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1968	43	166	26	35.2 (n=41)*
1969	49	160	31	34.8 (n=48)*
1970	68	182	37	33.8 (n=67)*
1971	53	211	25	33.0 (n=47)*

* n = number of sets of horns in sample.

A regulation prohibiting the use of vehicular transport methods during the first portion of the sheep season was adopted for the 1971 hunting season. The regulation was an attempt to set up a high quality hunting area for hunters willing to walk into the sheep mountains. The effect of this regulation can be seen in several of the above figures.

The reported harvest of sheep from this area decreased by 25 percent (68-53) from 1970 to 1971. At the same time the harvest of sheep from the Alaska Range East in general increased by 10 percent. The reported number of hunters in the DMA (Delta Management Area) increased by 15 percent (182-211) while the hunters in the Alaska Range East increased by 40 percent. The success ratio of these hunters has decreased as one would expect when a greater percentage of the hunters are using the least efficient means of transportation - walking.

The percent of all hunters by transportation method used and the percent success by transportation method used based on 149 reporting hunters are shown below:

	Walk-in	Airplane	Off-road Vehicle	Motorbike	Horse
% All Hunters	64	12	15	5	4
% Success by Transport Method	32	80	65	40	20

Considering these figures it is interesting to note that 56 percent of the total harvest occurred during the walk-in portion of the season (8/10 - 8/26) and 44 percent occurred during the period 8/26 - 9/20/71.

Within the Delta Management Area approximately 95 percent of all hunters are residents and they take approximately 90 percent of the harvest.

Composition and Productivity

Information on composition and productivity of sheep in the Delta Management Area have not been gathered consistently in the past. Several recent surveys, however, indicate that lamb production is good and similar to that found in the central Alaska Range East.

The percentages of legal rams in this population as indicated during aerial surveys are shown below:

Year	% Legal Rams in Populations
1969	14.0 (n=877)*
1970	9.3 (n=701)*
1971	7.2 (n=1437)*

*n=number of sheep in sample.

Increased harvest and probable lowered survival of lambs during 1966 and 1967 have lowered the percentage of legal rams in the population.

Management Summary and Recommendations

The Delta Management Area was originally set up as a high quality hunting area where the walk-in hunter had a reasonable chance of taking a trophy ram. The area choosen has an abundant sheep population and is accessible to the walk-in hunter. It was expected when this regulation was adopted that: 1) the total harvest of sheep would decrease, 2) the number of hunters that the area could support would increase due to the lower success ratio of walk-in hunters, and 3) that the trophy value of the area or the average size of harvested rams would increase. It was further expected that hunters using vehicles would be encouraged to use other areas. Not all expectations were borne out during this hunting season.

The harvest of rams from the Delta Management Area did decrease during the 1971 season. The number of hunters increased, although on a percentage basis there was not the increase in the Delta Management Area that there was in the Alaska Range East. The trophy value of the area, or average size of harvested rams, did not increase but rather continued to decrease. Although some hunters that formerly used vehicles in this area apparently moved to new areas this year, many simply waited for the later portion of the season and then went into the area.

It is not likely that the objectives of the Delta Management Area will be completely met if the present management continues. In order to increase the trophy value of the area and to lengthen the period when walk-in hunters have a chance at trophy rams it is recommended that vehicular transport method be prohibited for a greater portion of the sheep season.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep, since mature ewes constitute a major portion of the population. It is recommended that regulations be adopted that would give the hunters utilizing this area the opportunity to harvest a ewe sheep if they so desire. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep, but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should allow for the continued harvest of trophy rams.

Submitted by: Arthur C. Smith, Game Biologist II

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 13 - Central portion of Chugach Mountains and eastern portion of Talkeetna Mountains

Season and Bag Limits

Unit 13	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger

Harvest and Hunting Pressure

Harvest report returns since 1962 have shown the kill of rams to be as follows:

1962* - 107	1967 - 152
1963 - 132	1968 - 159
1964 - 156	1968 - 155
1965 - 143	1970 - 134
1966 - 154	1971 - 139

*1962 was the first year of the harvest ticket report. Coverage is known to have been incomplete.

Composition and Productivity

No data collected this reporting period.

Management Summary and Conclusions

Harvest and apparent hunting pressure have remained quite constant for the past ten years. There is no indication that hunting has had a significant effect on the huntable number of legal rams, except of course, for local accessible areas. About 40 percent of the Unit 13 harvest comes from the Chugach Range.

Recommendations

No changes recommended at this time.

Submitted by: Loyal Johnson, Game Biologist III

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 14 - Western portion of Chugach and Talkeetna mountains

Seasons and Bag Limits

Unit 14	Aug. 10 - Sept. 20	One ram with 3/4 curl or larger
Unit 14 that portion described as the West Chugach Management Area	Aug. 10 - Sept. 20*	One ram with 3/4 curl or larger

*From August 1 through November 30 the West Chugach Management Area is closed to all motorized vehicular transportation, except boats, involving hunting away from established roads and airports each year.

Harvest and Hunting Pressure

Based on harvest ticket returns the harvest of rams in Game Management Unit 14 is as follows:

1967	1968	1969	1970	1971
72	76	94	63	59

The ram harvest in 1971 compares favorably with the 1970 harvest. A possible cause for fluctuations over the past five years in the Unit 14 ram harvest is weather conditions during the open hunting season.

Harvest report returns for the entire Chugach Mountain Range (which includes Subunits 14A and 14C) reveal 586 hunters took 109 rams for a 19 percent success ratio.

To further refine the entire Chugach Range data, 518 resident sheep hunters harvested 70 rams for a 14 percent success ratio while 53 non-residents took 35 rams for a 66 percent success ratio.

Composition and Productivity

No counts were conducted in Unit 14 during 1971.

Management Summary and Conclusions

The ram harvest (109) in the Chugach Range in 1971 is nearly identical with the 1970 harvest. The number of hunters has increased by 83, which in turn has decreased the success ratio.

Hunters are still confused by the dual regulations imposed by the Alaska Board of Fish and Game and the State Parks Division. Both organizations disallow the use of vehicular transportation away from the established roads and airports. The Chugach State Park regulations, in addition, prohibit the discharge of firearms within one mile of established roads and trails.

Surveys conducted in the past years (1949 to 1969) reveal an upward trend in the sheep population in Unit 14, with a concurrent decrease in ram percentage. The harvesting of rams only will continue this trend.

Recommendations

Inventory counts should be conducted in Subunit 14C during 1972. In the future, consideration should be given to combining State Park Division regulations with the West Chugach Management Area regulations to make them less confusing to the hunting public.

Submitted by: Jack C. Didrickson, Game Biologist III

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 16 - South side of Alaska Range west of Mt. McKinley

Seasons and Bag Limits

Unit 16	Aug. 10 - Sept. 20	One ram with 3/4 curl or larger

Harvest and Hunting Pressure

Based on harvest ticket returns, the harvest of rams over the past five years is represented below:

1967	1968	1969	1970	1971
4	9	14	11	8

During 1971, a total of 13 hunters harvested eight rams for a 62 percent success ratio. Only five hunters were unsuccessful, according to harvest ticket data. Four sheep were taken in the Yentna River - Mt. Dall area and four in the Rainy Pass area.

Composition and Productivity

No sheep counts were conducted in Unit 16 during 1971.

Management Summary and Conclusions

Little sheep hunter pressure is exerted in Unit 16. The combination of access difficulties, rugged terrain and poor weather conditions keep hunter pressure low. Hunting has little measurable effect on the Unit 16 sheep population.

Recommendations

Until further sheep research in other game management units has been completed, there does not appear to be any reason to request changes in the game regulations.

Submitted by: Jack C. Didrickson, Game Biologist III

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Parts of GMU's 20 and 25 - Tanana Hills - White Mountains

Seasons and Bag Limits

Unit 20*	Aug. 10 - Sept. 20	One ram with 3/4 curl horns or larger
Unit 25	Aug. 1 - Sept. 20	One ram with 3/4 curl horns or larger
*Unit 20 that portion known as Glacier Mountain Management Area	Aug. 10 - Sept. 20**	One ram with 3/4 curl horns or larger

**From 12:01 a.m., August 5 to 12:01 a.m., September 21 no motorized vehicles nor pack animals may be used to transport hunters, hunting gear, or game within the Glacier Mountain Management Area.[1]

[1]Due to a different management plan in the Glacier Mountain Management Area, the survey and inventory report for this area follows the Tanana Hills - White Mountains report.

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Tanana Hills - White Mountains, are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1967	8	23	35	-
1968	21	68	31	32.4 (n=19)*
1969	1	16	6	27.5 (n=1)*
1970	11	28	39	34.4 (n=11)*
1971	15	43	35	35.6 (n=15)*

*n = number of sets of horns in sample.

The number of hunters increased by 54 percent and the harvest of sheep increased by 36 percent from 1970 to 1971 within the Tanana Hills - White Mountains complex. Percent success decreased slightly during the same period. Whether these figures represent a general upward trend in hunting pressure throughout the range is unknown.

Since sheep in this area are highly scattered and found in small groups, they could be subject to harvest beyond annual trophy production. In localized areas, such as the Charley River and Twin Mountain area, it is likely that the major portion of the trophy rams have been removed this past year. The Charley River supported 40 percent of the kill from the entire Tanana Hills - White Mountains complex during the 1971 season.

In this mountain range approximately 80 percent of all hunters are residents and they take approximately 80 percent of the harvest.

Composition and Productivity

No information was gathered on composition and productivity in this mountain range.

Management Summary and Recommendations

The Tanana Hills - White Mountains complex is, in general, a lightly hunted area. There are a few areas that receive moderate to heavy hunting pressure. The sheep in this complex are in small, widely scattered groups and are subject to harvest beyond annual production. Hunter success will decrease in a few localized areas if pressure continues to increase. Future regulations may be proposed to prohibit exploitation of the ram segment of some localized sheep populations.

Information on composition and productivity should be gathered on an annual basis. A trend count area should be established in the Tanana Hills - White Mountains complex.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. It is recommended that consideration be given to regulations that would allow the harvesting of limited numbers of ewe sheep from accessible areas.

Part of GMU 20 - Glacier Mountain Management Area

Season and Bag Limit

Unit 20	Aug. 10 - Sept. 20*	One ram with 3/4 curl or larger

*From 12:01 a.m., August 5 to 12:01 a.m., September 21 no motorized vehicles nor pack animals may be used to transport hunters, hunting gear or game within the Glacier Mountain Management Area.

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Glacier Mountain Management Area are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1968	1	1	100	34.0 (n=1)*
1969	1	3	33	37.5 (n=1)*
1970	1	1	100	39.5 (n=1)*
1971	2	6	33	33.8 (n=2)*

*n = number of sets of horns in sample.

Composition and Productivity

The lamb:ewe ratios and the percentages of legal rams in the population gathered from Glacier Mountain are given below:

Year	Lamb:ewe ratios	% Legal Rams in Population
1969	23:100	22 (n=78)*
1970	23:100	20 (n=66)*
1971	43:100	8 (n=87)*

*n = number of sheep in sample.

The lamb:ewe ratio appears low compared with lamb:ewe ratios from the Alaska Range East. The percent of legal rams in the population has dropped significantly from 1970 to 1971. Considering the reported harvest this decrease is difficult to explain.

Management Summary and Recommendations

New regulations that prohibited vehicular transportation methods to Glacier Mountain drew attention to the area and subsequently increased hunter pressure. This additional pressure probably will not recur next year and the total hunter pressure will drop to one, two or three hunters as in the past.

Reported hunting pressure does not explain the decrease in the percentage of legal rams in the population. Since Glacier Mountain is easily surveyed, it is not likely that any sheep were missed on the August survey. This decrease could be explained by rams moving off the mountain but it is also possible that a high unreported harvest occurred during the 1970 hunting season. There is some evidence to support this possibility. It is recommended that information on composition and productivity be gathered on an annual basis from Glacier Mountain.

No changes in the regulations regarding trophy rams are recommended.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. It is recommended that consideration be given to regulations that would allow the harvest of a limited number of ewe sheep. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep, but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should allow for the continued harvest of trophy rams.

Submitted by: Arthur C. Smith, Game Biologist II

SHEEP

SURVEY-INVENTORY PROGRESS REPORT - 1971

Parts of GMU's 23, 24, 25 and 26 - Brooks Range

Seasons and Bag Limits

Units 23, 24, 25 and 26	Aug. 1 - Sept. 20	One ram with 3/4 curl horns or larger

Harvest and Hunting Pressure

The reported sheep harvests, hunter pressures, success percentages and mean horn lengths in inches for the Brooks Range from 1967-1971 are given below:

Year	Sheep Harvest	No. of Hunters	Percent Success	Mean Horn Length
1967	105	156	67	-
1968	144	201	72	33.2 (n=64)*
1969	68	121	56	33.4 (n=62)*
1970	121	171	71	34.3 (n=119)*
1971	168	271	62	34.3 (n=163)*

*n = number of sets of horns in sample.

Although the 1971 figures indicate a 58 percent increase in total number of hunters since 1970 and a 40 percent increase in the harvest during the same period, an overall trend is not evident for the past five years. Success ratios and mean horn sizes have not changed significantly in the past five years.

In the Brooks Range, approximately 55 percent of all hunters are residents and they take approximately 45 percent of the harvest.

Composition and Productivity

During June, July and August a biologist studying movement patterns at the head of the Dietrich River reported a lamb:ewe ratio of 32:100. This ratio does not indicate a high level of productivity but is based on a small sample from a limited area. Production may be higher throughout the range.

No information is available on the percentage of legal rams in the population; however, it is expected that this percentage has not been altered significantly by hunting pressure.

No distribution and abundance surveys were conducted during this reporting period.

Management Summary and Recommendations

In the past, hunting pressure has not had a significant effect on sheep populations in the Brooks Range. In the future it is expected that hunting pressure both from residents and nonresidents will increase in this area. Conflicts between residents and nonresident guided hunters will increase.

With an expected increase in hunting in the Brooks Range, it is recommended that trend count areas be established. Information on composition and productivity within this area should be gathered on an annual basis.

It is also recommended that distribution and abundance information be completed in this mountain range. Without this information it is impossible to analyze harvest information in relation to the total abundance of sheep in the area.

The greatest present use of sheep in this area is as a source of trophies and hunting opportunity. No changes in the regulations regarding trophy rams are recommended.

At the present time there is no biological justification for regulations that prohibit the harvesting of ewe sheep. It is recommended that consideration be given to regulations that would allow the harvest of ewe sheep. Regulations providing for this harvest should not allow the harvest of all sex and age classes of sheep but should be directed specifically at the ewe segment, thus protecting the younger rams. Regulations should allow for a continued harvest of trophy rams.

Submitted by: Arthur C. Smith, Game Biologist II

MUSKOXEN

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 18 - Yukon-Kuskokwim Delta

Nunivak Herd

Composition, Productivity and Mortality

Muskoxen were reintroduced to Alaska during the early 1930's by the U. S. Biological Survey. Thirty-one Greenland muskoxen were placed on Nunivak Island. Nunivak Island is considered to be much to the south of original muskox range in Alaska. Early records indicate that the success of the muskox population on Nunivak Island was quite precarious during the early years. However, by 1941 the herd was estimated at 76. From 1947 to 1968, the herd increased at an average annual rate of about 16 percent until they reached a high of about 760 muskoxen. Transplants were conducted from Nunivak Island to Nelson Island in 1967 and 1968.

Population Estimations

Classes and numbers of muskoxen counted are listed in the following table:

Date	Population Estimate	Number of Muskox Counted		
		Adults and Subadults	Calves	Total
April 1968		673		673
Summer 1968	750-760	614	100	714
1969	-	-	-	-
February 1970		593		
March 1971	500-505	481		481
September 1971	550-575	469	71	540

Population estimates and counts were made by the U. S. Bureau of Sport Fisheries and Wildlife. Population estimates and counts from 1936 to 1968 are available in the following publication:

Spencer, D. L. and C. J. Lensink. 1970. The Muskox of Nunivak Island. J. Wildl. Mgmt. 34(1):1-15.

A severe imbalance of the sex ratio exists in the Nunivak muskox herd. The sex ratio of muskoxen two years old, or older, in 1966 was 53 percent males. This increased to 56 percent males in 1968 and again was 56 percent in 1970. By 1971, the sex ratio had further distorted to 70 percent males. In March, 1970, Calvin J. Lensink, Refuge Manager, reported that only 56 percent of adult females were productive in 1969 as compared to 73 percent in 1967. Lensink also indicated that prior to 1967 nearly all adult females produced calves. Mortality averaged about 7 percent from 1949 to 1968. During the winter of 1968-69, 165 animals (22 percent of the population) were lost. During the winter of 1970-71, the indicated loss was 56 animals, or 11 percent of the population.

Range Condition

Muskox winter range on Nunivak Island is very limited. Total available winter habitat may not exceed 4,000 acres. Of the 4,500-acre dune area which is the preferred winter range of the muskoxen, less than one-half may be available and under severe winter conditions, even this area is reduced. The overall condition of this limited range has deteriorated considerably in the past and continues to show signs of deterioration.

Management Summary and Recommendations

The previous mismanagement of the Nunivak muskox herd may have made it impossible to ever restore the herd to the level of vitality it possessed in the 1960's. The present deadlock between the State of Alaska and the federal government has resulted in an unnecessary loss of the resource. In order to return the herd as rapidly as possible to a semblance of its former vitality, the following is recommended:

1. Remove 200 adult male muskoxen by public shooting or a slaughter controlled by federal or state authorities.

2. Stabilize the breeding herd at 300 to 350 muskoxen of breeding age.

3. Remove all calves and subadults in excess to those necessary to replace the natural mortality in the breeding herd.

4. Establish the winter range condition trend.

Nelson Island Herd

Herd Size, Composition, Productivity and Mortality

Muskoxen were transplanted from Nunivak Island to Nelson Island in 1967 and 1968. Eight animals were released in 1967. There is a conflict in the reports of the sex composition of the 1967 release. Sex composition is variously reported to have been five males and three females and six males and two females. Fifteen additional animals (6 male calves,

9 female calves and 1 male 2 years old) were released in 1968. Six of the eight animals released in 1967 were observed in 1968.

Very few sightings have been reported of the Nelson Island herd. Eighteen were observed in March, 1969 and 22 were observed in September, 1970. Four calves were observed in 1969 and five calves were observed in September, 1970. Production and survival of this group was excellent up through the last documented observations in 1970.

Range Condition

No range observations have been made on Nelson Island. The excellent production and survival of the muskoxen released on Nelson Island and the early breeding of females (all females released in 1967 and 1968 were calves) is indicative of good range conditions.

Management Summary and Recommendations

The serious mismanagement of the Nunivak muskox herd makes it imperative to determine the seasonal movements of the Nelson Island herd and to identify preferred ranges so that range condition and trends surveys can be established. Up-to-date surveys and estimates of the population should be made as soon as possible. Of utmost importance is an agreement between the state and federal government covering the eventual management and utilization of the herd.

Submitted by: Oliver E. Burris, Game Biologist IV

MUSKOXEN

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 22 - Seward Peninsula

Seasons and Bag Limits

No open season.

Herd Size, Composition, Productivity and Mortality

Two dead muskox were found. A yearling female (#10037) apparently fell through the ice and drowned. A 2- or 3-year-old was apparently killed by a bear which almost completely consumed the carcass. The muskox's ear tags were not located. At the end of the year 12 other muskoxen from the original transplant could not be located.

Two calves born following the transplant were reared successfully. Apparently no calves were produced in 1971. One adult female, 1 to 2 years old and one yearling are near Cape Douglas. A herd of 21 moved from Brevig Mission to the lower Nuluk River. This herd consists of four adults, 16 2+ year-olds, and one yearling.

Management Summary and Recommendations

The herd of 21 on the Nuluk River is the largest herd of transplanted muskoxen that can be located. Monitoring of this herd should continue and a special effort be made to determine if any calves are produced in the spring of 1972.

Future transplants should not be considered until after it is determined which of the established herds will be productive.

Submitted by: Robert E. Pegau, Game Biologist III

MUSKOXEN

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 23 - Kotzebue Sound

Seasons and Bag Limits

No open season.

Herd Size, Composition, Productivity and Mortality

Two muskoxen, #10039 and 10130 were found washed ashore near Kivalina. Apparently they had drowned and it is likely that they had broken through the sea ice. There were several sightings of muskoxen on the sea ice, and drowning after breaking through the ice apparently is a major mortality factor with muskoxen.

Most sightings of muskoxen were of groups of three to five animals. There were two groups of seven muskoxen, each sighted several times in the spring. A group of 13 was reported in the fall near the Kukpuk River but have not been resighted since then. No calves have been observed with any of the muskoxen.

Management Summary and Recommendations

The Cape Thompson muskox have not stabilized into herds. They are still forming into large groups and then breaking up into smaller groups. The groups are spread over a 200 square mile area so that their chances for reproduction are reduced. It is recommended that additional transplants to the Cape Thompson area not be undertaken until there is an indication that the animals already there will be productive.

Submitted by: Robert E. Pegau, Game Biologist III

MUSKOXEN

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 26 - North Slope

Seasons and Bag Limits

No open season.

Herd Size, Composition, Productivity and Mortality

In cooperation with the U. S. Bureau of Sports Fisheries and Wildlife, the Alaska Department of Fish and Game conducted the first transplant of muskoxen from Nunivak Island to the North Slope of Alaska, Game Management Unit 26, in 1969. A second transplant to Unit 26 was conducted in 1970.

A total of 51 muskoxen were moved in four loads from Nunivak Island to Barter Island as follows:

On March 26, 1969 the first C-123 Air National Guard plane load of muskoxen arrived at Barter Island. This load consisted of 16 animals:

10 calves
3 adult males
3 adult females

On March 29, 1969 the second load of muskoxen arrived at Barter Island. They consisted of 8 animals:

1 calf
4 adult males
3 adult females

This load originally had nine animals. One died en route and was removed from the plane at Fairbanks.

On April 6, 1969, the third load of muskoxen arrived at Barter Island. They consisted of 12 animals:

4 calves
1 yearling male
5 adult females
2 adult males

On April 14, 1969, the fourth load of muskoxen arrived at Barter Island. They consisted of 15 animals:

9 calves
1 yearling male
5 adult males

Of the 51 muskoxen released near Barter Island in 1969 seven are known to have died by June 10:

MORTALITY

1 calf 2 adult females 1 adult male	Died by April 30.
3 calves (2M & 1F)	Died by June 10.

See report by William H. Griffin "Muskox Release on Barter Island March & April 1969", for details.

On June 25, 1970, 13 muskoxen were transported from Nunivak Island and released on the Kavik airstrip in Game Management Unit 26 on the North Slope of Alaska. They consisted of:

1 two-year-old male
3 two-year-old females
2 three-year-old males
7 three-year-old females

In 1971 several observations of muskoxen were made in Unit 26 as follows:

DATE	OBSERVATION #	
Summer 1971	1	One adult male observed 30 miles south of the north coast of Alaska on the Kongakut River. This observation made by the crew of an oil company helicopter.
July 29, 1971	2	Seven muskoxen observed at section 10, township 3N, Range 24E. This is at the west end of Sadlerochit Mountain. This observation made by Mr. Richards of the Atlantic Richfield Oil Co.
Summer 1971	3	Four muskoxen observed 24 miles south of the north coast of Alaska on the Okerokovik River. This observation made by Abe Thayer U. S. Bureau of Sports Fisheries and Wildlife.
Summer 1971	4	One young muskoxen observed six miles west of the east end of Sadlerochit Mountain. Their observation made by Abe Thayer.

DATE	OBSERVATION #	
June 22 to July 20, 1971	5	Approximately ten muskoxen observed on the Aichilik and Kongakut rivers 20 to 30 miles south of the coast.
Summer 1971	6	One adult male muskox observed six miles from the west end of the Shublik Mountains. This observation made by Abe Thayer.
Summer 1971	7	Four muskoxen observed near Demarcation Bay. This observation made by Abe Thayer.

Observations of muskoxen on the north slope of Alaska Game Management Unit 26 in 1971 totaled 28 animals. Two of these were adult males and 26 were of unknown sex. One was reported to be young. It is possible that some of these observations are duplicates. Observation number five of ten muskoxen probably includes the four observed in observation seven. There were probably 24 different muskoxen observed and recorded in 1971. However, this should not be taken as a complete census of the North Slope.

Observation two which places seven muskoxen at the west end of Sadlerochit Mountain could possibly be the animals released at Kavik airstrip in 1970.

Management Summary and Recommendations

From the 1971 observations, at least 24 muskoxen were probably in Unit 26.

It is recommended that more complete surveys be made to ascertain the total number, distribution, reproduction and sex ratios of the North Slope muskox herd. Additional transplants should not be made to this area until one or more of the groups localize their movements and successfully reproduce.

Submitted by: William Griffin, Game Biologist III

SEA OTTER

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 1-16 - Coastal Waters

Seasons and Bag Limits

Units 9 and 10 excluding the Near Island group and Pribilof Islands	The Commissioner may allow a controlled harvest by the Department or its authorized representative.
Units 1-8 and 11-26	No open season

Harvest and Hunting Pressure

A total of 79 sea otters were removed from Amchitka during transplant activities and an additional 94 were harvested for scientific studies. A substantial reduction in numbers of sea otters occurred within a six to eight mile radius of the nuclear blast "Cannikin" detonated at Amchitka on November 6. The number killed has been estimated at 1,000 to 1,350 on the basis of pre-test and post-test counts.

Near record sea ice conditions caused several hundred sea otters to die between Port Heiden and Cold Bay during March.

Composition and Productivity

Recent information indicates that the Amchitka population is considerably larger than previously estimated and a review of survey techniques suggests that all populations are larger than previously estimated from aerial surveys; however, previous conclusions on relative abundance and distribution are probably correct.

The sea otter population in southeastern Bristol Bay has extended its range northeast of Port Heiden.

Two concentrations of transplanted sea otters are established on Chichagof and Yakobi islands. Approximately 35 percent of the animals in each area were females with pups. There has been an increase in sightings of sea otters in the Necker Islands south of Sitka and near Craig.

Analysis of reproductive tracts collected in 1970 indicates that the average birth weight of sea otters at Tanaga is below normal and there is a higher incidence of resorptions. This tends to confirm earlier impressions that the condition of these animals is declining, particularly on the east side of the island.

The body condition of animals collected at Amchitka has been improving since 1969 indicating the potential for an increase in numbers.

Management Summary and Conclusions

A total of 1,919 sea otters have been removed from Amchitka Island through harvests and transplants since 1962. Of these, 1,426 were removed between September 1967 and June 1971. All but 200 have come from the southeastern third of the island. At the present time, the only observable effects of removing these animals has been a slight reduction in numbers along six miles of shore where transplant captures have been concentrated and an increase in the percentage of subadults in the same area. The percentage of subadults in an adjacent area appears reduced. The body condition of sea otters around the entire island has improved, indicating that this is not an effect of harvesting. The implication is that the Amchitka population can withstand an annual harvest considerably larger than 300.

While a considerable reduction in numbers occurred in a local area as a result of a nuclear test, the actual number killed was probably less than 15 percent of the population and complete recovery should occur in a few years.

The mortality caused by severe sea ice conditions in Bristol Bay had little effect on the distribution and numbers of sea otters, but observations made during the period of heavy ice suggest that sea ice will limit further expansion of the distribution of this population.

Recommendations

The removal of sea otters from populations through harvests, transplants or collections should be continued to provide information on the effects of harvesting on sea otter populations. The islands from Kiska to Kagalaska all have harvestable populations. Populations in all other parts of the state are either increasing in density or expanding into unpopulated area. Large-scale removal of animals from these areas would hinder the recovery of sea otter populations from the low levels of the early 1900's.

The recovery of the Amchitka population from the mortality caused by "Cannikin" should be monitored closely.

The Prince William Sound population is expected to provide more opportunity for public viewing as that area's recreational potential is developed and as sea otters move onto the Kenai Peninsula from that area. This population also provides a potential source of transplant stock. The proposed oil pipeline and potential development of the immediate area may have some effect on the population. More intensive studies should be directed toward this area to recognize and minimize the effects of this development.

Submitted by: Karl B. Schneider, Game Biologist III

HARBOR SEAL

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 1-16 - Coastal Waters

Seasons and Bag Limits

Units 1 through 16	June 20 - July 31 Oct. 15 - April 30	No limit

Harvest and Hunting Pressure

Approximately 6,000 seal pups were killed by commercial hunters on the Alaska Peninsula, Kodiak Island area and Kenai Peninsula. An additional 2,000 seals were killed in the Prince William Sound and Southeastern Alaska regions. Harvest levels and hunting pressure have remained fairly constant since 1969 in the above mentioned areas. Tugidak Island and Ugak Island in Game Management Unit 8 were closed to hunting by emergency regulation on July 1, when it was determined that pup harvest may have exceeded 50 percent of the estimated total pup production for the islands.

Seal harvesting at Tugidak Island, Port Heiden and Port Moller has been closely monitored since 1965. Table 1 compares the yearly harvests from these areas.

Table 1. Yearly Comparison of Seal Harvest.

Year	Tugidak	Port Heiden	Port Moller
1965	4100	4000	-
1966	2200	3100	2300
1967	700	2278	1935
1968	800	2180	1091
1969	900	2940*	1230
1970	1160	804	858
1971	1100	1746	945

*Includes 561 from Cinder River.

Composition and Productivity

Although the results of aerial surveys of seal populations tend to be very erratic, the populations at Tugidak Island and along the north side of the Alaska Peninsula appear to be stable. Comments by hunters and incidental observations by department personnel indicate the seal populations in Southeast Alaska are increasing. Seal numbers in Prince William Sound also appear to be increasing, particularly off the Copper River Flats. The south side of the Alaska Peninsula and the Aleutian Islands are not being hunted and little information is available for these areas.

At Port Heiden, 97 pups and two adults were tagged prior to the opening of the seal season. By the end of the season 34 tagged pups had been recovered by hunters, all within the Port Heiden area.

Management Summary and Conclusions

The annual harvest of harbor seals for the past three years has been 8,000 to 10,000 animals. Thirty-five to 50 percent of the total taken came from three areas; Tugidak Island, Port Heiden and Port Moller. The seal populations in most areas of the state appear to be under harvested.

Recommendations

Tugidak Island and the Alaska Peninsula should be monitored closely. The current season and bag limits should remain unchanged.

Submitted by: John S. Vania, Game Biologist IV

SEA LION

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 1-26 - Coastal Waters

Seasons and Bag Limits

Units 1 through 26	No Closed Season	No limit*

*Provided that the taking of sea lions for commercial purposes in excess of 10 is permitted only under the terms of a permit that may be issued by the Commissioner in consideration of conservation requirements.

Harvest and Hunting Pressure

In 1971, 3,314 sea lion pups were harvested by commercial operators from two rookeries in Game Management Unit 10. Hunters took 2,250 pups at Akutan Island and 1,064 at Ugamak Island. No animals were taken at either Sugarloaf Island or Marmot Island. Total harvest of sea lions in previous years was 6,075 in 1970; 5,208 in 1969; 4,118 in 1968; 4,855 in 1967; 3,050 in 1966; 3,029 in 1965; and 1,500 in 1964. No adult animals were reported taken for commercial purposes.

Composition and Productivity

The Steller sea lion population in Alaska is probably at the carrying capacity of its habitat. Occasional surveys of various rookeries indicate little change in the general abundance and distribution of the animals. An exception is Sugarloaf Island where, since the advent of pup harvesting in 1964, there has been a gradual decline in the number of adults utilizing the rookery. The number of pups born on the island had declined from an estimated 6,000 in 1964 to 2,000 in 1970.

In 1971 the island was closed to harvesting to see how the population would respond to the lack of hunter disturbance during the pupping season. A beach count of pups made on July 15 showed that the population responded favorably. Pup production had increased to an estimated 3,500 to 3,800 animals and the adults were once again utilizing beach areas that had been previously abandoned.

Management Summary and Conclusions

The presence of hunters on a rookery during June when pups are being born has varying effects on the adult population. On Sugarloaf Island, hunter activity has apparently caused abandonment of rookery beaches and has resulted in reduced pup production. On Marmot Island, Akutan Island and Ugamak Island the distribution of adults on the rookeries has changed somewhat since hunting has begun but the production of pups appears to have remained fairly constant. The reason for the different response to hunter activity on the rookeries is not fully understood.

Recommendations

Monitoring of all harvest operations should be continued. If harvesting is permitted on Sugarloaf Island, hunters should not be allowed on the island until the animals have established territories and many of the pups have been born.

Submitted by: John S. Vania, Game Biologist IV

BISON

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - Wrangell Mountains - Chitina River

Seasons and Bag Limits

By Commissioner's announcement.

Harvest and Hunting Pressure

Copper River herd	No open season in 1971
Chitina River herd	No hunting allowed

Composition and Productivity

Copper River Herd. Replicate aerial surveys were conducted on July 9 and July 30, 1971 (Appendix I). The 1971 surveys indicate a population reduction of about 20 percent from the posthunt 1970 population of 105 animals (119 observed - known harvest 14). Percentage of calves observed was down by about 33 percent from 1970. This is a continuation of a trend of reduced production beginning in 1968. The cause of the apparent lowered production is unknown, but it is probably range related. Based on an unwritten Department policy of holding this herd at approximately 100 animals and the low counts during 1971, no hunt was held.

Chitina River Herd. No formal surveys were conducted on the Chitina River herd during 1971 by this Department. Mr. Lee Alder, wildlife biologist, Bureau of Land Management, Glennallen, has made his records of observations of that herd available. Alder reports that on December 27, 1971, while patrolling horse grazing leases, he observed 16 bison near Bryson Bar on the upper Chitina River. Three of these animals were young of the year. On February 29, 1972, Alder again observed 16 bison on Bryson Bar on the upper Chitina River. No attempt was made to make sex and age determinations in the February observations.

Count records for the Chitina River herd are summarized in Appendix II.

Management Summary and Recommendations

Copper River Herd. Management objectives should be to provide the maximum hunting potential consistent with the sustained yield principle. Drawings or limited permit hunting should be delayed as long as possible to provide hunting opportunity to all who wish to participate. However, with such a small herd, hunting must be closely regulated. Until better data are available, this herd should be held at approximately 100 animals and yearly kill should not exceed the observed annual calf crop.

Chitina River Herd. This herd is not large enough to allow hunting.

Recommendations

No changes recommended.

Submitted by: Loyal Johnson, Game Biolgist III

BISON - GMU 11 - Wrangell Mountains - Chitina River

APPENDIX I

Population Data on Copper River Bison Herd - Unit 11

Date	Total Bison Observed	Percent Calves	Hunter Kill	Data Source
1950	17	-	Transplanted to Nabesna Road near Slana	
3/61	29	-	No season	Robert A. Rausch - ADF&G
7/62	74	21	No season	Robert A. Rausch - ADF&G
7/62	74	21	No season	Robert A. Rausch - ADF&G
1963	No data			
7/64	97	17.5	14	Loren Croxton - ADF&G
7/65	84	22.6	11	William Griffin - ADF&G
8/66	79	11.3	No season	William Griffin - ADF&G
8/67	51	27.5	No season	William Griffin - ADF&G
7/68	102	18.6	13	Julius Reynolds - ADF&G
7/69	100	18.0	16	Loyal Johnson- ADF&G
7/70	119	17.7	14	Loyal Johnson- ADF&G
7/9/71	87	12.6	No season	Loyal Johnson - ADF&G
7/30/71	76	11.8	No season	Loyal Johnson - ADF&G

Submitted by: Loyal Johnson, Game Biologist III

BISON - GMU 11 - Wrangell Mountains - Chitina River

APPENDIX II

Historical Data for Chitina River Bison Herd

Year	Total Bison Observed[1]	Percent Calves	Source
1962	35 young bison (29 FF, 6 MM) transplanted to May Creek airstrip. Data not available to indicate whether present Chitina River herd from that transplant or egress from Copper River herd.		
1963	No data		
1964	12	42	Loren Croxton - ADF&G
1965	No data		
1966	9	0	William Griffin - ADF&G
1967	12	16.7	Jack Wilson - bush pilot
1968	16	12.5	Julius Reynolds - ADF&G
1969	16[2]	6.3[3]	Loyal Johnson - ADF&G
1970	16	12.5	Loyal Johnson - ADF&G
1971	16	18.6	Lee Adler - BLM

[1]Several observations made some years. Data given here represents greatest numbers of animals seen in any given year.

[2]See 1969 S&I report.

[3]The calf observed in February, 1970 makes a theoretical population of 16 in 1969.

Submitted by: Loyal Johnson, Game Biologist III

BISON

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 19 - McGrath (Farewell Herd)

Seasons and Bag Limits

Unit 19 No open season

Harvest and Hunting Pressure

Hunting of bison was not allowed in 1971.

Herd Size, Composition and Productivity

Counts of the Farewell herd since August, 1970 are summarized in Appendix 1. Reproduction appeared good, but survival was apparently not very good. If the respective counts from 1970 and 1971 are truly representative, overwinter population loss was about 13 percent. Because of the limited movements of this herd, the counts probably are indeed comparable.

Snow depths were great in the McGrath area during 1970-71, and may have contributed to higher mortality of bison, even though snow depth where bison were feeding did not exceed 24 inches (60 cm) in early December, 1970 (Appendix II). Snow depth in spruce woods adjacent to Station 2 (Appendix II) was approximately 24 inches (60 cm) on 14 March 1971, which suggests that between wind and settling, accumulation between December and March was negligible in portions of the herd's range.

From late November through mid-March the herd fed extensively on sedges (*Carex* sp.) around ponds and in dry ponds, and in mixed woods adjacent to the South Fork. Snow conditions in these situations are represented by Stations 1 and 2 (Appendix II). Snow depth and the heavier crust probably hindered feeding. Once craters were made the snow became very hard, and it is unlikely bison could use the same areas again.

A feeding area on Submarine Lake, north of Farewell Lake, was examined on March 14. Although sedges were abundant and snow was soft and shallow (14 inches), the sedges were largely unavailable because of overflow which covered them and froze. Windblown knolls with snow conditions similar to Station 3 still provided usuable grazing areas, but such situations comprise a relatively limited area.

Therefore, substantial winter loss of bison is not surprising in years with considerable snow.

Between December 1 and December 9, 1970, Robert Pegau examined winter bison feeding areas, and made a reconnaissance of Windy Fork

and Big River. In July, 1971 Pegau did additional reconnaissance and clipped sample plots in various plant communities for preparation of carrying capacity estimates. His report is in preparation. Neither the Windy Fork nor Big River were considered good bison range because of limited forage and frequently deep and drifted snow.

A summary of population growth and snow conditions is planned to accompany Pegau's range report.

Management Summary and Recommendations

The herd was estimated at 70-75 in 1971. Present indications, though inconclusive, are that the range may not adequately support more than 100 bison. Considering the recent substantial natural mortality the herd should be held to its present level until the winter survival improves.

Up to 10 bison could be taken from the Farewell herd. Such a hunt will be proposed for 1972.

Submitted by Richard H. Bishop, Game Biologist IV

BISON - GMU 19 - McGrath (Farewell Herd)

APPENDIX I

Bison observations, South Fork Kuskokwim River, 1970-71.

Date	Observer	Bison Seen				Remarks
		Adults[1]	Calves	Total	% Calves	
1970						
29 Aug.	R.H. Bishop J. Allen	48	13	61	21	Good count conditions
31 Aug.	Bob Curtis			73		Unconfirmed
26 Nov.	Bob Curtis			53		Reconnaissance
1-9 Dec.	Bob Curtis R. Pegau					Reconnaissance
1971						
19 May	R.H. Bishop J. Allen	53	14	67	21	Some turbulence
28 May	R.H. Bishop J. Allen	51	16	67	24	Good count conditions

[1] Includes yearlings.

Submitted by: R. H. Bishop, Game Biologist IV

BISON - GMU 19 - McGrath (Farewell Herd)

APPENDIX II

Measurements of snow at bison feeding area, South Fork, Kuskokwim River, December 1970.

Station and Location	Layer	Thickness (in.)	Distance from ground to top layer (in.)	Hardness (g/cm^2)	Remarks
1. S. Fork 5 mi. above Tatina (Rohn) River	1. Bottom	5 to 6	6	1	Large sublimated, ice crystals. No structure.
		.5 to 1.	6	40,000	Crust at 5" to 6" above ground, hardness measured horizontally.
				4,000	Measured vertically.
	2	7	13	80	Partly sublimated crystals. Soft.
	3	6	19	10	Very soft.
	4	4	23	--	Powder. Too soft to measure. Crust easily broken. Unsupported. Depth probably hinders feeding.

Appendix II (cont'd.)

Station and Location	Layer	Thickness (in.)	Distance from ground to top layer (in.)	Hardness (g/cm^2)	Remarks
2. S. Fork 5 mi. above Tatina (Rohn) River	1. Bottom	6	6	1	Large, sublimated, ice crystals. No structure.
		.5	6	3,000 to 4,000	Crust. At 5" to 6" above ground.
	2	11	17	15	Soft.
	3	4	21	--	Too soft to measure powder. Crust unsupported. Easily broken. Depth probably hinders feeding.
3. S. Fork Hills West of Egypt Mt., S. of High Lakes	1. Bottom	6. to 6.5	6.5	10	Soft. Some sublimation.
		0.5	6.5	(approx.) 150	Two very thin layers of crust at 6" to 6.5"
	2	2 to 3.5	10	--	Too soft to measure. Powder.
					Generally favorable feeding area. Wind blown southerly slope.

Submitted by: R. H. Bishop, Game Biologist IV

BISON

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 20 - Fairbanks, Central Tanana (Big Delta and Healy Lake herds).

Seasons and Bag Limits

To be announced	One bison every five regulatory years (a limited number of mature bison will be taken).

Harvest and Hunting Pressure

There were 3758 applicants for the annual Delta bison hunt. Ninety-six percent of these applicants were Alaskan residents. Twenty hunters were chosen by public drawing, and 15 bulls and 5 cows were harvested during the seven-day hunt. There has not been a hunting season on the Healy Lake herd.

Composition and Productivity

No complete survey of the Delta bison herd has been attempted since 1960. However, surveys of that portion of the herd that is found along the Delta River and in the vicinity of Delta Junction have been made annually since 1960. Comparison of the maximum number of adults seen each year has revealed a gradual decline from 1960 through 1968 and a gradual increase since 1968. The survey in June, 1971 revealed 209 bison including calves.

The ratio of bulls per 100 cows, including subadults, in the Delta herd was 42 in 1960 and 36 in 1971. Although the bull-cow ratio of the Delta herd has probably been reduced by selective removal of bulls during annual harvests, it is believed that the primary effect of harvesting has been to lower the average age of bulls. The ratio of bulls per 100 cows, excluding subadults, was 30 in 1971. Since bison are polygamous and bulls are capable of breeding at 2 to 3 years of age, the percentage of bulls in the herd is still excessive from the standpoint of maximum production of calves.

The demonstrated gross rate of increase of this herd shortly after its introduction into Alaska was 20 percent annually. When adjusted to reflect the current bull-cow ratio, the gross rate of increase this year should be about 26 percent. The actual percentage of the herd which was calves was found in an October, 1971 composition count to be 27 percent. Annual mortality from hunting, road kills, poaching, and natural causes in recent years is estimated to be 15 to 20 percent. In a herd that is stable or only slowly changing its abundance from year to year, the annual mortality of breeding adults must be equaled by the annual addition of breeding adults. The percentage of yearlings in the herd in

1971 was found to be 15 percent and compares in value to the estimated annual mortality. Net productivity, the difference between gross rate of increase and annual mortality, is being lost through low survival of calves. It is believed, therefore, that herd numbers are currently limited by environmental factors such as food supply and that surplus productivity is not being fully utilized.

Management Summary and Recommendations

The current harvesting level of 20 bison from the Delta herd is conservative. The hunter harvest could be safely increased by harvesting older animals (mainly bulls) with the expectation of reducing the number of adults, increasing production of calves, and increasing survival of calves. However, one of the management objectives for bison in Alaska is to provide recreational observation. Since trophy size bulls are impressive in appearance and can be preserved with current harvesting techniques, it is recommended that a few of the largest bulls be retained in the Delta herd primarily for aesthetic purposes.

A review of old records has revealed that approximately 40 bison were observed in the vicinity of Healy Lake in 1947. Surveys of this bison herd have been hindered because of the dense cover. The largest sighting made since 1947 was approximately 150 bison, but most surveys since 1963 have revealed a maximum of 25 to 63 bison. Thirty-six bison were observed in early spring in 1971. Although it is still not certain that this herd is distinct from the Delta herd, the numbers of the Healy Lake group of bison have not changed appreciably in many years and are probably limited by winter range. Considering the popularity of bison hunts among Alaskan residents (more than 180 applicants for every permit issued for the 1971 Delta bison hunt), a limited harvest of the Healy Lake herd is recommended.

Submitted by: Carl McIlroy, Game Biologist II

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Units 1A and 1B - Southeast Mainland, south from Cape Fanshaw

Seasons and Bag Limits

Aug. 1 - Jan 31 Two goats

Harvest and Hunting Pressure

Harvest tickets for goats were not issued for the 1971 season. Harvest data were obtained from a personal hunter survey of approximately 10 percent of the permit holders in Ketchikan, Wrangell and Petersburg.

A total of 340 hunters were contacted in the Ketchikan-Wrangell-Petersburg area (hunting license sales: 3602). A total of 31 goat hunters made 36 trips and killed 14 goats for a hunter success of 45 percent. None of the successful hunters killed more than one goat. Number of days hunted was not obtained. Six of the 14 goats were males, six were females and two were unknown. Airplanes were used as transportation means in four of the trips. Expanded figures would indicate 328 goat hunters took 148 goats in Units 1A and 1B.

Dates and locations of the hunting trips and goats taken are presented in Appendices I and II, respectively.

Ketchikan contributed the majority of the people hunting goats. Of the 200 license holders contacted in Ketchikan, 23 had hunted goats. Ten goats (5 male, 5 female) were taken in 28 separate trips. Airplanes provided the transportation in 20 of the trips and boats were used on the other eight.

Expanded figures for Ketchikan indicate 255 goat hunters took 111 goats, 80 percent of which were taken in Unit 1A.

Composition and Productivity

Aerial surveys utilizing a Piper PA-12 were made on September 13, 15 and 16 along three semiestablished transects in Unit 1A.

The K-3 transect, located between Rudyerd and Smeaton bays was flown on September 15, between 6:25 p.m. and 7:45 p.m. (80 minutes of flight time). Sixty-nine adults, 21 kids and four unknown age goats were seen, which is a ratio of 30 kids per 100 adults. Weather conditions were considered average - light wind, 75 percent overcast and no rain. The maximum temperature for the day was 53 degrees.

The K-4 transect between the Wilson Arm of Smeaton Bay and Boca de Quadra was started on September 13 and finished on September 15. Both flights were between 5:40 p.m. and 6:40 p.m. (total of 70 minutes flight time). The kid/adult ratio of 36:100 was obtained from 155 adults, 56 kids and nine of unknown age. Weather conditions were favorable with light winds, 75 percent overcast and a maximum temperature of 54 degrees.

The K-5 transect between the Marten River and Portland Canal was flown under poor weather conditions. It was clear, calm and warm - about 62 degrees. Flight time was 83 minutes in the evening of September 16, between 5:18 p.m. and 8:19 p.m. Many of the goats seen were below timberline, probably seeking shade. One hundred thirty-three adults, 34 kids and one unknown age goat were counted. The kid/adult ratio was 26:100.

A flight was made on January 22, 1972, in an attempt to identify goat winter range in the area of the September surveys. Beaches and areas of different elevations up to 3000 feet were flown for three hours and 34 minutes but no goats were seen. Tracks, most of which were assumed to be goats, were found throughout the area. The majority were along the timbered beaches below 500 feet elevation but some extended up to 2500 feet.

On February 28, 1972, a day was spent in Rudyerd Bay and Walker Cove checking from a skiff in an attempt to locate wintering goats and note any signs of winter mortality. Tracks were noted in almost all areas where visibility was good. Most sign was seen on the north sides of both bays. Seven goats were seen in Rudyerd and none were found in Walker, although density of tracks was similar in both areas. Four wolves were seen in Walker Cove, and goat hair was found in a wolf scat.

Snow depths were five to six feet along the shorelines and wintering conditions appeared poor. Two hunters were contacted who had killed goats in late January and their descriptions indicated animals in poor condition with no body fat.

Management Summary and Recommendations

No attempt was made to estimate the total goat population in Units 1A and 1B, but the harvest in these units is extremely light and has no measurable effect on the herd. The season dates and bag limit are well-received by the public and provide ample hunting opportunity for anyone desiring to hunt goats.

Summer surveys are subject to many variables and the cost is high for the data obtained. Annual surveys are probably not necessary considering the present low use of this resource.

Little is known of the goat winter range in these units, and I feel more time should be directed toward identifying winter habitat. Future timber sales are planned in these areas and information is needed as to the effect logging will have on wintering goats and winter habitat.

Magnitude of animal loss in severe winters could be determined under the same study.

Statewide goat harvest tickets will be issued next year to obtain more complete hunter and harvest data.

Submitted by: Robert E. Wood, Game Biologist III

MOUNTAIN GOAT - GMU 1A and 1B - Southeast Mainland

APPENDIX I

Dates by Month of Goat Hunting Trips and Kills

	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Unk.	Total
Trips made	4	8	11	3	0	2	8	36
Goats killed	2	4	4	0	0	1	3	14

APPENDIX II

Locations of Goat Hunting Trips and Kills

Location		Trips	Goats
Ketchikan			
Humpback Lake		3	
Badger Lake		1	1
Boca de Quadra		2	
Fillmore Inlet		3	2
Cleveland Peninsula		3	
Stikine River		1	1
Rudyerd and Goat lakes		6	2
Chickamin Area (LeDuc)		3	1
Bradfield Canal		1	1
Wilson Lake		1	1
Smeaton Bay		2	1
Area Unknown		2	
	Total	28	10
Wrangell			
Arrons Creek		1	
Bradfield		1	
LeConte		1	1
Unknown		1	1
	Total	4	2
Petersburg			
Unknown		4	2
	Total	4	2
	Grand Total	36	14

Submitted by: Robert E. Wood, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 1C - Juneau

Seasons and Bag Limits

Aug. 1 - Jan. 31 Two goats

Harvest and Hunting Pressure

Actual figures which reflect the overall harvest and hunting pressure are not known for the 1971 season. To obtain some idea of the magnitude of the harvest and hunting pressure, hunter interviews (in conjunction with the deer harvest survey) were conducted in Juneau, Douglas and Auke Bay in January and February, 1972. From a sample of 250 licensed hunters, 40 (16.0%) indicated they had hunted goat. Of the 16 hunters, 40 percent were successful and took nine goats (4 males, 4 females and 1 unknown).

Chronology of the harvest as indicated by the hunter interviews revealed no harvest during the months of October, December or January. Goats were taken in August (2), September (4), November (1) and date unknown (2).

Based on results of the Juneau hunter interviews and hunting license sales, it is estimated that 118 goats were taken in Unit 1C in 1971.

Composition and Productivity

Adult and kid composition counts were conducted in portions of Unit 1C in July, 1971. Counts in the Berners Bay (73 observed) and Endicott River (157 observed) areas revealed kid/adult ratios of 30:100 and 28:100, respectively.

Management Summary and Conclusions

Only a small segment of goat populations in Unit 1C are hunted; however, areas close to Juneau which have reasonably good access receive considerable hunting pressure. Surveys should be continued in these areas to measure population changes.

Recommendations

No season or bag limit changes are recommended at this time.

Submitted by: David Zimmerman, Game Biologist II

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 1D - Haines

Seasons and Bag Limits

Aug. 1 - Jan. 31 Two goats

Harvest and Hunting Pressure

Harvest information based on 250 hunter interviews conducted in Juneau, Douglas and Auke Bay during the months of January and February, 1972, indicated that five hunters each took one goat in Unit 1D (2 males, 2 females and 1 unknown). The five hunters spent an average of 2.4 days to take each goat. Two were taken in August, two in September and one unknown.

No hunter surveys were made in Haines or Skagway.

Composition and Productivity

No data available.

Management Summary and Conclusions

Most of the goat habitat in Unit 1D is rugged and relatively inaccessible to most hunters. Hunting pressure is light. Additional information on distribution, abundance and composition is needed for Unit 1D.

Recommendations

No changes in seasons or bag limits are recommended at this time.

Submitted by: David Zimmerman, Game Biologist II

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 4 - Admiralty, Baranof, Chichagof and adjacent islands

Seasons and Bag Limits

Unit 4 Chichagof Island	No open season	
Remainder of Unit 4	Aug. 1 - Jan. 31	Two goats

Harvest and Hunting Pressure

Most goats taken in Unit 4 are harvested by residents of Sitka. Weather conditions greatly affect hunting pressure; in 1971, conditions were approximately the same as in 1970, with considerable snow and much wind.

An interview-questionnaire survey of Sitka hunters in early January, 1972, disclosed that 11 of 151 interviewees had hunted goats, compared to six of 150 the previous year (7.3% vs 5.5%). The total calculated number of goat hunters among 1025 licensed Sitka hunters in 1971 was 75. This is somewhat higher than the 60 calculated for 1970 (1082 licensees).

Of the 11 interviewees who hunted goats in 1971, five were successful (45.5%); each of these took one goat, of which four were males and one was female. The estimated harvest was 20 goats in 1971, compared to 14 in 1970.

Based on the questionnaire results, goat hunters expended 6.4 days of hunting per goat taken, somewhat lower than the 10.0 days required per goat taken in 1970.

Composition, Productivity and Distribution

Delayed snow melting followed by almost constant winds and turbulence prevented making any meaningful counts in 1971. I was able to determine, however, that the goat population on Baranof Island appears to be still expanding southward. In 1970 only a few tracks were seen south of Red Bluff Bay; in 1971, 15 goats were observed between Red Bluff and Hoggatt bays.

Sightings of goats continue to be reported from Chichagof Island. In 1971 there were reports of two seen on the mountains north of Tenakee, and three in the mountains above Stag Bay. Attempts were made to check out both reports, but turbulence and early snowfalls rendered the efforts futile.

Management Summary and Recommendations

No changes in seasons or bag limits are recommended; the goat population on Baranof is large enough to absorb a much larger harvest than it presently sustains.

Mountain goats on Baranof Island sometimes winter in areas adjacent to salt water. These areas should be identified to prevent possible conflict with logging.

A helicopter should be utilized in making composition counts of goats in the Katlian and Red Bluff bay drainages, to ascertain whether there are differences between well-established and relatively new habitat.

Submitted by: Alan Courtright, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 5 - Yakutat

Seasons and Bag Limits

Aug. 1 - Jan. 31	Two goats

Harvest and Hunting Pressure

None available.

Composition and Productivity

Aerial composition counts made in the Brabazon Range north of the Yakutat foreland in October, 1971, are shown in Appendix I. An additional 102 goats were observed during glacier bear surveys in the Alsek Glacier - Novatak Glacier areas in June, 1971.

Management Summary and Recommendations

More complete harvest and hunting information is needed for sound management recommendations. Hunting pressure is very light and goats are abundant in some areas, but many locations are inaccessible to hunters. It is recommended that seasons and bag limits remain unchanged.

Submitted by: David Zimmerman, Game Biologist II

MOUNTAIN GOAT - GMU 5 - Yakutat

APPENDIX I

Mountain Goat Composition Counts, Brabazon Range, October 5, 1971

Unit	Number/Area	Adults	Kids	Kid/Adult Ratio	Sample
Y-1	Fasset Glacier-Split Creek	40	11	28:100	51
Y-2	Split Creek-Novatak Glacier	116	53	46:100	169
Y-3	Harlequin Lake-Akwe Lake	57	6	11:100	63
Total		213	70	33:100	283

Submitted by: David Zimmerman, Game Biologist II

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 6 - Prince William Sound

Seasons and Bag Limits

Aug. 1 - Jan. 31 Two goats

Harvest and Hunting Pressure

The actual harvest and hunting pressure exerted in Unit 6 during the 1971 season are unknown. A very crude indication was obtained by interviewing 100 Cordova hunters and multiplying their kill by six (approximately 600 licensed hunters in Cordova). Based upon the hunter interview data an estimated 66 mountain goats were taken by Cordova hunters (Appendix I). The hunting effort exerted by out-of-town hunters is relatively small and it is safe to assume the total harvest was less than 100 mountain goats.

Composition and Productivity

No data collected.

Management Summary and Conclusions

Judging from incidental observations and from general knowledge on hunting effort, the Unit 6 mountain goat population is basically an untouched resource. The present regulations are satisfactory.

Recommendations

Retain the present season and bag limit.

Submitted by: Julius Reynolds, Game Biologist III

MOUNTAIN GOAT - GMU 6 - Prince William Sound

APPENDIX I

Mountain Goat Harvest by Cordova Hunters in Unit 6

Year	Estimated Harvest*
1971	66
1970	42
1969	No Data
1968	42
1967	114

*Since there are approximately 600 licensed hunters in Cordova, data were obtained by interviewing 100 Cordova hunters and multiplying by six.

Submitted by: Julius Reynolds, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 7 - Seward

Seasons and Bag Limits

Unit 7 that portion draining into salt water south and east of Fourth of July Creek	Aug. 10 - Dec. 31	Two goats
Unit 7 that portion west of a line from the mouth of Sixmile Creek near Hope to the Sterling Highway along the Sterling Highway to Ptarmigan Creek; north of a straight line from Ptarmigan Creek bridge to Porcupine Island in Kenai Lake, then a straight line from Porcupine Island to the head of Upper Russian Lake; east of Russian River from Upper Russian Lake to Kenai River and north of the Kenai River from the confluence of Russian River to the Unit 15 boundary	Sept. 21 - Nov. 15	One goat
Remainder of Unit 7	Aug. 10 - Nov. 15	One goat

Harvest and Hunting Pressure

The harvest questionnaire was discontinued in 1971, and 1970 data were not tabulated because of poor hunter response. As a result, information on harvest and hunting pressure is not available.

Numbers, Composition and Productivity

Age composition and population trend counts have been conducted on two selected trend count areas since 1968 with a third area added in 1970. Data from the combined trend count areas show substantial declines during

1971 from the average for the preceding years. Both numbers counted and kids/100 adult ratios (Appendix I) have declined. The 1971 counts yielded 301 goats counted and a ratio of 23.9 kids/100 adults. The total number of goats observed dropped by 27.7 percent from the average for 1968-1970, while the number of kids/100 adults dropped by 24.8 percent.

In addition to the trend count areas surveyed, six other goat count areas were surveyed. These areas were first and last surveyed in 1968.

The number of goats counted in all nine count areas decreased 24.5 percent from 757 in 1968 to 571 in 1971. The kid/100 adult ratio decreased 20.1 percent from 32.9 to 26.3 during the same period.

Cooper Mountain survey data indicate that the declining trend in numbers since 1963 may have leveled out at a greatly reduced number during 1969-71 (Appendix II). An extrapolation from two observations of goats in the area during 1971 indicates a minimum number of ten goats using the area.

Surveys of count areas 14 and 15 (Hope-Resurrection Creek areas) indicate a small goat population in the area which has probably declined significantly since 1968 (Appendix III). Nineteen goats were located during surveys in 1971, seven of which could have been duplicates, compared to 38 counted in 1968.

Management Summary and Conclusions

As noted above in comparing 1968 and 1971 data the aggregated data from the three trend count areas show the same downward trend and almost same degree of decrease in goat numbers and kid/100 adult ratios as to the aggregated data from all count areas. Because of this correlation it appears that monitoring the three trend count areas annually should generally indicate what is occurring in the unit as a whole. Furthermore it appears that goat numbers probably decreased throughout the unit from 1968 through 1970 as the trend counts indicate. The significant decline in numbers and kid/100 adult ratios is most probably attributable to the relatively severe winter in the mountainous areas of the Kenai Peninsula during 1971. Although information is not available on hunting pressure in the unit, it is almost certain that hunting played no role in the decline. The almost universal decline in numbers in all areas including those with very light hunting; the reduced kid/100 adult ratios and the increase in numbers with declining productivity prior to 1971 all indicate that hunting has not been a significant factor.

Possible exceptions are count areas 14, 15 and 20. Populations in these count areas have followed a downward trend and total numbers are low. Because access to these count areas is good and goats are often taken incidental to sheep, black bear and moose hunting, the harvest of goats may have contributed to the decline and a continued general goat season could be detrimental to maintaining goats in this area.

Opening the new Resurrection River road will provide access to previously difficult-to-reach goats and will require monitoring.

There is a definite need for determining goat hunting pressure and for gathering harvest data. These data will help in assessing the role of hunting in population changes and will also help in determining specific area management objectives.

Because of the many unknowns about goats in Alaska, there is a need for a detailed study of Alaskan mountain goat life history and ecology.

Recommendations

It is recommended that (1) the area west of the Hope Road and Seward Highway from Hope to Ptarmigan Creek north of a line from the mouth of Ptarmigan Creek to Porcupine Island in Kenai Lake and a line from Porcupine Island to the south end of Upper Russian Lake and east of the National Forest boundary be closed to taking mountain goats until the effect of hunting of these goats is better understood, (2) the Board of Fish and Game authorize goat harvest tickets and hunter reports for goat hunting throughout the state, and (3) the Alaska Department of Fish and Game undertake a long-range goat research program to learn more of the life history and ecology of the Alaskan mountain goat.

Submitted by: James Davis, Game Biologist II and Paul A. LeRoux, Game Biologist III

MOUNTAIN GOAT - GMU 7 - Seward

APPENDIX I

Goat Numbers and Age Ratios, Unit 7, 1968-71.

Year	Count Area 4 Trend Area 1 Kids/ 100 Ad.	Count Area 4 Trend Area 1 Total Animals	Count Area 5 Trend Area 2 Kids/ 100 Ad.	Count Area 5 Trend Area 2 Total Animals	Count Area 8 Trend Area 3 Kids/ 100 Ad.	Count Area 8 Trend Area 3 Total Animals	Combined Trend Areas 1, 2 & 3 Kids/ 100 Ad.	Combined Trend Areas 1, 2 & 3 Total Sample
1968	35.2	207	22.4	60[1]	38.2	170	34.5	437
1969	28.5	144	37.8	102	*	*	32.3	246
1970	27.0	155	23.5	105	32.3	217	28.5	476
1971	26.8	90	30.6	64	19.5	147	23.9	301
1968-70	$\bar{x}$=30.2	$\bar{x}$=169	$\bar{x}$=27.9	$\bar{x}$=103[1]	$\bar{x}$=35.3	$\bar{x}$=194	$\bar{x}$=31.8	$\bar{x}$=386

*No survey conducted.

[1]The 1968 data from Count Area 5 are excluded from the $\bar{x}$ because they are obviously invalid.

Submitted by: James Davis, Game Biologist II and Paul A. LeRoux, Game Biologist III

MOUNTAIN GOAT - GMU 7 - Seward

APPENDIX II

Goat Numbers and Age Ratios, Cooper Mountain, Unit 7

Year	Kid/100 Ad.	Total Animals
1963	34.7	66
1964	30.0	39
1968	16.7	21
1969	0	7
6/14/71	0	9
8/10/71	20.0	6

Submitted by: James Davis, Game Biologist II and Paul A. LeRoux, Game Biologist III

MOUNTAIN GOAT - GMU 7 - Seward

APPENDIX III

Goat Numbers and Age Ratios, Unit 7, 1968 and 1971

	Area 6		Area 10		Area 14		Area 15		Area 17		Area 20	
	1968	1971	1968	1971	1968	1971	1968	1971	1968	1971	1968	1971
Kids/100 Ad.		37.5	33.3	35.0	45.4	0	50.0	20.0	29.0	27.6	16.7	11.1
Total/Animals	48	33	84	54	32	0	6	12	129	161	21	10

Submitted by: James Davis, Game Biologist II and Paul A. LeRoux, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 8 - Kodiak and Adjacent Islands

Seasons and Bag Limits

Sept. 1 - Oct. 30	15 goats by permit only. Conditions of the hunt to be described by Commissioner's announcement.

Harvest and Hunting Pressure

The 1971 harvest consisted of three females and one male goat; all were taken from the Crown Mountain area.

Only 11 of the 25 goat permit holders went afield. Three of the 25 permits were not returned.

Composition and Productivity

No information on composition or productivity has been gathered.

Management Summary and Recommendations

No changes recommended.

Submitted by: Jack E. Alexander, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - Wrangell Mountains - Chitina

Seasons and Bag Limits

Aug. 10 - Dec. 31 Two goats

Harvest and Hunting Pressure

No data available.

Composition and Productivity

No data available.

Management Summary and Conclusions

Without data, conclusions cannot be drawn.

Recommendations

It is recommended that harvest tickets be required for all persons hunting goats as we now know little of the hunting effort or harvest on this species.

Submitted by: Loyal Johnson, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 13 - Nelchina Basin

Seasons and Bag Limits

Aug. 10 - Dec. 31 Two goats

Harvest and Hunting Pressure

No data available.

Composition and Productivity

No data available.

Management Summary and Conclusions

Without data, conclusions cannot be drawn.

Recommendations

It is recommended that harvest tickets be required for all persons hunting goats as we now know little of the hunting effort or harvest on this species.

Submitted by: Loyal Johnson, Game Biologist III

MOUNTAIN GOAT

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 15 - Western Kenai Peninsula

Seasons and Bag Limits

Aug. 10 - Dec. 31 Two goats

Harvest and Hunting Pressure

Data from 1970 hunter questionnaires were not processed due to poor return of information. With the 1971 change from the harvest ticket packet to single harvest tickets, the questionnaire was discontinued. Therefore, data on harvest and hunting pressure are not available.

Composition and Productivity

No data collected in 1971.

Management Summary and Conclusions

New data have not been collected since 1968; therefore, management conclusions cannot be made. Generally, hunting pressure is light in this unit. Access to goat hunting is entirely by plane or boat with the exception of the timber company road from Jakolof Bay to Rocky Bay; this road is usable by Seldovia residents and persons employed by the timber company. With access so restricted it is extremely doubtful that hunting could influence goat populations in this unit anywhere except in the immediate vicinity of access points.

Recommendations

No changes in seasons or bag limits are recommended. Aerial surveys of the most accessible portions of this unit should be undertaken if funds and weather permit.

Submitted by: Paul A. LeRoux, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 6 - Prince William Sound

Seasons and Bag Limits

Sept. 1 - June 30	One bear; provided that the taking of cubs or females accompanied by cubs is prohibited.

Harvest and Hunting Pressure

The actual harvest and hunting pressure exerted on black bears in Unit 6 are unknown. The military recreation camp at Valdez was not in operation this year, thus the hunting pressure from Valdez was probably less than the past few years. Hunting pressure from Whittier continues to increase but no accurate measure of it is available.

Composition and Productivity

Beach surveys along the northeastern half of Prince William Sound were flown to determine black bear distribution, abundance and preferred areas. The coast from Cordova to Valdez Narrows was flown June 5 and 6. Twelve adults and one sow with a small cub were observed. The area from Point Freemantle (Valdez Arm) to Coghill River including Ester Island was flown June 7 and 24 black bears were observed: 19 adults, one sow with a small cub and a sow with two large cubs. This area was reflown August 17 and only 10 bears were seen, 6 adults plus a sow with three large cubs.

During a brown bear - black bear survey from Okalee Spit to Icy Bay August 24, seventeen black bears were observed, all of which were adults.

Management Summary and Conclusions

Lack of data on hunting effort, harvest and population dynamics makes it impossible to determine the actual status of black bear in Unit 6. Judging from the aerial survey data plus incidental observations, the bear population south of Cordova appears to be fairly high whereas in Prince William Sound it is low but not to the point of necessitating alteration of the season.

Recommendations

No change in the present regulations.

Submitted by: Julius Reynolds, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT -1971

Game Management Unit 7 - Seward

Seasons and Bag Limits

Aug. 10 - June 30	Three bears; provided that not more than one may be a blue or glacier bear and that the taking of cubs or females accompanied by cubs of the blue color phase is prohibited.

Harvest and Hunting Pressure

Data relating to the harvest of, and hunting pressure on, black bears are not available. However, some general statements can be made based on general observations.

Black bears are heavily hunted along the road system in Unit 7, however, this form of hunting is not highly successful. A fair amount of black bear hunting also takes place along the Forest Service trail systems in this unit, particularly along the Resurrection Creek - Juneau Creek Trail System. Success is dependent upon weather and snow conditions in the spring and the availability of berries in the alpine in the fall.

Composition and Productivity

Composition and productivity surveys are not made in this unit but general statements can be made based on field observations. Many black bears have been observed in this unit incidental to other game surveys. Bears are generally abundant throughout the unit but are particularly common in the drainages into the Chickaloon River, Resurrection Creek and Juneau Creek.

Management Summary and Conclusions

Based on general observations black bears appear to be abundant throughout the unit, particularly in the vicinity of the Resurrection Creek - Juneau Creek Trail System where hunting pressure is relatively heavy. Hunting appears to be having little, if any, effect upon bears in this unit.

Recommendations

No changes are recommended.

Submitted by: Paul LeRoux, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 9 - Alaska Peninsula

Season and Bag Limits

No closed season — Three bears

Harvest and Hunting Pressure

No work accomplished.

Composition and Productivity

No work accomplished.

Management Summary and Conclusions

Black bears occur only in the northeastern portion of Unit 9. Hunting pressure on the species is light.

Recommendations

No changes in seasons or bag limits are recommended at this time.

Submitted by: James B. Faro, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 11 - Wrangell Mountains - Chitina River

Seasons and Bag Limits

No closed season — Three bears

Harvest and Hunting Pressure

There are no data available on the sport kill of black bears. However, it is known that a considerable number of bears are killed under the defense of life or property provisions at the various construction and survey camps throughout the area. These kills are usually unnecessary; the problems arise mostly from inadequate and illegal garbage disposal or poor food storage facilities at the camps. Bears killed in these cases are not normally salvaged. At least six black bears were known to have been killed at a Department of Highways camp on the Chitina River in 1971.

Management Summary and Conclusions

While not a threat to the black bear resource, the number of bears wasted by being killed at construction and survey camps should be minimized through periodic inspection of the camp's garbage and food storage facilities. These inspections should be coordinated through the Department of Labor and the Department of Fish and Game.

Recommendations

No changes in season or bag limits are recommended.

Submitted by: Loyal J. Johnson, Game Biologist III.

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 12 - Upper Tanana River - White River

Seasons and Bag Limits

No Closed Seasons — Three bears

Harvest and Hunting Pressure

No black bear harvest data are available for Unit 12. Casual observations indicate the harvest is small. Popularity of this species, especially among nonresidents, is expected to increase. The present small harvest is probably not limiting or controlling the population.

Composition and Productivity

There were numerous indications of a moderate black bear population throughout the Interior in 1971; however, the population was noticibly lower than in 1970. Natural mortality is probably responsible for this decline. Black bear populations in interior Alaska do not seem to be related to hunting or other human influence except possibly in very localized areas.

Management Summary and Recommendations

Because black bear populations are presently controlled by factors other than hunting mortality, no changes in bag limits or seasons are recommended at this time.

Submitted by: Larry Jennings, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 13 - Nelchina Basin

Seasons and Bag Limits

No closed season — Three bears

Harvest and Hunting Pressure

There are no data available on the sport kill of black bears. However, it is known that a considerable number of bears are killed under the defense of life or property provisions at the various construction and survey camps throughout the area. These kills are usually unnecessary; the problems arise mostly from inadequate and illegal garbage disposal or poor food storage facilities at the camps. Bears killed in this manner are not normally salvaged.

Management Summary and Conclusions

While not a threat to the black bear resource, the number of bears wasted by being killed at construction and survey camps should be minimized through periodic inspection of the camps' garbage and food storage facilities. These inspections should be coordinated through the Department of Labor and the Department of Fish and Game.

Recommendations

No changes in season or bag limit are recommended.

Submitted by : Loyal J. Johnson, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 15 - Western Kenai Peninsula

Seasons and Bag Limits

Data relating to the harvest of and hunting pressure on black bears are not available; however, some general statements can be made based on field observations.

Hunting pressure on black bears throughout this unit is generally light. Most black bears are taken incidental to sheep, goat and moose hunting although some hunting specifically for black bears does occur, particularly in the spring.

Most of the hunting effort directed specifically at black bears occurs in the vicinity of Kachemak Bay. Bears are hunted along the bluff near Homer and on the slopes above salt water on the east side of Kachemak Bay. Rugged terrain and dense vegetation makes hunting fairly difficult and bears are not particularly vulnerable in this area. Some spring hunting also takes place along the Swanson River, Swan Lake Road and in the vicinity of Skilak Lake.

Composition and Productivity

Black bear composition and productivity surveys are not conducted in this unit. However, based on general observations and several incidents of nuisance bears, black bears appear to be abundant throughout this unit.

Management Summary and Conclusions

Based on general observations black bears appear to be abundant throughout this unit and are nowhere particularly vulnerable to hunting. Most bears are apparently taken incidental to hunting for other species and the harvest appears to be having little, if any, effect on the population.

Recommendations

No changes are recommended.

Submitted by: Paul A. LeRoux, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 17 - Bristol Bay

Season and Bag Limits

No closed season Three bears

Harvest and Hunting Pressure

No work accomplished.

Composition and Productivity

No work accomplished.

Management Summary and Conclusions

No work accomplished.

Recommendations

No changes in seasons or bag limits are recommended at this time.

Submitted by: Jim Faro, Game Biologist III

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORT - 1971

Game Management Unit 19 - McGrath

Seasons and Bag Limits

No Closed Season — Three bears

Harvest and Hunting Pressure

Hunting pressure throughout Unit 19 is light. Black bears are usually taken opportunistically by moose hunters. An unknown but small number are probably shot and left. An estimated six bears were taken by McGrath hunters in 1971. Some spring hunting is done, mainly by hunters with airplanes. The number of bears taken is primarily a function of their abundance and movement patterns.

Abundance, Composition and Productivity

No surveys were made. Comparing general observations and reports of bears seen in 1969, 1970 and 1971; 1970 seems to have been the year with the highest population level. Bears were frequently seen by fishermen, hunters and firefighters. Numerous sightings of bears were reported in and near McGrath. Bear tracks and trails were abundant. In both 1969 and 1971 black bears were common, but fewer reports were received, and I saw fewer bears.

The same general remarks apply to eastern Unit 21, adjacent to Unit 19.

Management Summary and Recommendations

No regulatory changes are recommended.

Submitted by: Richard Bishop, Game Biologist IV

BLACK BEAR

SURVEY-INVENTORY PROGRESS REPORTS - 1971

Game Management Unit 20 - Fairbanks, Central Tanana

Seasons and Bag Limits

No Closed Season — Three Bears

Harvest and Hunting Pressure

No data on the sport harvest or hunting pressure on black bear in Unit 20 are available. The low incidence of observations by Department employees combined with a small number of nuisance complaints from local residents indicate a lower black bear population than reported in 1970. Black bear are usually taken through chance encounter or incidental to other hunting; therefore, the lower bear population may be reflected in the number of hides received for tanning and mounting by the local Jonas Bros. receiving station. In 1971, 80 black bears were processed, compared to 147 hides presented in 1970 (the highest total in six years). These figures probably reflect the harvest trend throughout the Interior in 1971.

Composition and Productivity

Composition surveys are not conducted in this unit. The lower bear population in 1971 may be the result of poor cub survival following the severe winter of 1970-71. Other factors affecting productivity are unknown.

Management Summary and Recommendations

Black bear populations in Unit 20 do not appear to be adversely affected by current hunting regulations. In order to encourage the sport and trophy values of this animal, it is recommended that sows accompanied by cubs be protected, in addition to establishing an open season when hide quality is of greatest value.

Proper garbage disposal near residential areas must be encouraged.

Submitted by: Mel Buchholtz, Game Biologist II