ALASKA DEPARTMENT OF FISH AND GAME

JUNEAU, ALASKA

STATE OF ALASKA
Bill Sheffield, Governor

DEPARTMENT OF FISH AND GAME
Don W. Collinsworth, Commissioner

DIVISION OF GAME
W. Lewis Pamplin, Jr., Director
Robert A. Hinman, Deputy Director

ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES

PART V. BROWN BEARS

Edited and Compiled by
Alma Seward, Publications Technician

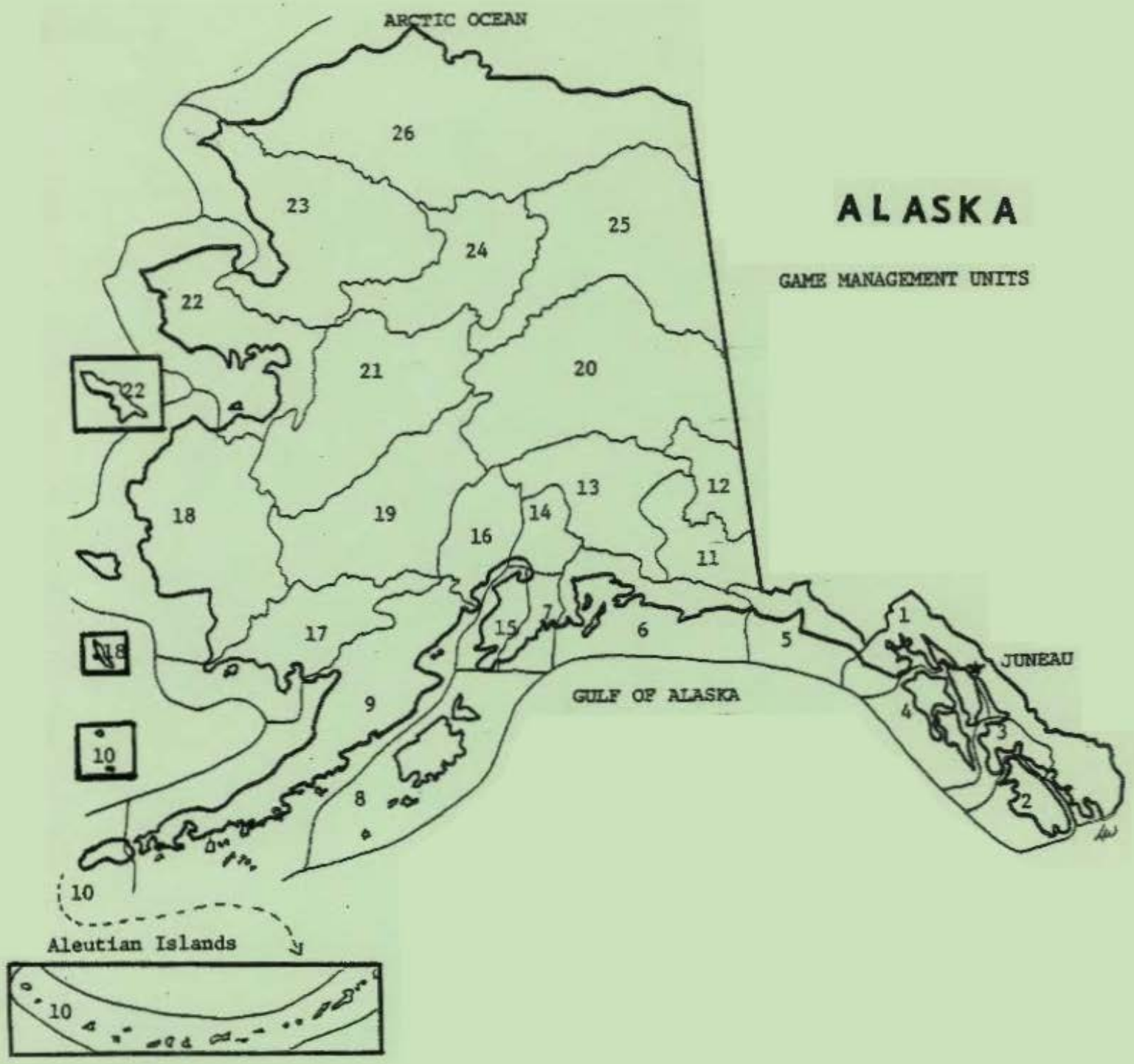
Volume XV

Federal Aid in Wildlife Restoration

Project W-22-2 and W-22-3, Job 4.0

(Printed December 1984)

CONTENTS


ARCTIC OCEAN
ALASKA
GAME MANAGEMENT UNITS
26
23
25
24
22
21
20
22
18
19
16
14
13
12
11
17
15
7
6
5
1
18
JUNEAU
GULF OF ALASKA
9
4
3
10
8
2
10
Aleutian Islands
10

Statewide Harvest and Population Status

Brown/grizzly bear populations in the state are almost uniformly high, and either stable or increasing. Bears are probably more abundant, statewide, than they have been for several decades.

Total bear harvest in CY 1983 was 981 bears, as listed below. In addition to the sport harvest, 49 bears were known to have been taken in defense of life or property. This source of mortality is cause for concern in a number of units.

Unit	Sport harvest	DLP kill
1	24	5
4	88	6
5	34	
6	38	2
7 and 15	7	1
8	156	5
9	199	10
10	6	
11	8	
12	13	
13	117	
14	8	2
16	24	
17	20	4
18	16	2
19	34	
20	57	4
21	6	1
22	28	4
23	39	
24, 25, and 26	59	3

Robert A. Hinman
Deputy Director

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 1

GEOGRAPHICAL DESCRIPTION: Southeast Mainland

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and No. 24

Population Status and Trend

No data were collected.

Population Composition

No data were collected.

Mortality

Based on brown bear sealing documents, the 1983 harvest in Unit 1 (includes 4 subunits) was 24 bears (18 males and 6 females). In addition, there were 5 defense of life and property bears taken: 1 female in Subunit 1C and 3 males and 1 female in Subunit 1D. Resident hunters accounted for 18 bears and nonresidents took 6.

Nine bears (8 males and 1 female) were taken during the spring season, all in May, identical to 1982; 15 bears (9 males and 6 females) were taken during the fall season: September, 7 bears; October, 6 bears; and November, 2 bears. The fall harvest was an 88% increase over the 1982 fall kill.

The mean skull size of males in 1983 was 23.0 inches ($\underline{N}$ = 18) and the mean cementum age was 10.8 ($\underline{N}$ = 16). The 23-year average male skull size and cementum age (including 1983 data) were 22.2 inches and 7.5 years, respectively.

Management Summary and Recommendations

The 1983 sport harvest of 24 bears was considerably greater than the 23-year average annual harvest (including 1983 data) of 15.8 animals, and 7 above the 1982 reported harvest. Extreme fluctuations in harvest levels are not uncommon for Unit 1. Since 1961, data suggest that similar increases in harvest levels have occurred periodically and are attributed

mainly to surges in resident hunter take either in 1 subunit or a combination of the 4 subunits.

An increase in hunting pressure and harvest is anticipated in Unit 1 as human populations and development of remote areas increase. Bear harvest levels in these areas should be closely monitored to assure proper maintenance of population levels.

No changes in season or bag limit were recommended.

PREPARED BY:

David W. Zimmerman
Game Biologist II

SUBMITTED BY:

Steven R. Peterson
Acting Management Coordinator

BROWN BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 4

GEOGRAPHIC DESCRIPTION: Admiralty, Baranof, Chichagof, and Adjacent Islands

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

No data available.

Population Composition

Experimental aerial censuses conducted by Region I bear research personnel in 1983 yielded classified counts of 100 animals. Cubs-of-the-year represented 21% of that total with a mean litter size of 1.91. Cubs older than young-of-the-year represented 19% with a mean litter size of 1.58. Combined, cubs of all ages comprised 40% of bears seen. Additional data will be systematically collected and reported in greater detail in future reports.

Mortality

The sport harvest in 1983 was 88 bears. Characteristics of the harvest were well within the standards for Unit 4. The reduced age of males and females shown in 1982 was not apparent in 1983. The total kill was somewhat above average.

Sport harvest statistics for 1961-1983 are shown in Table 1.

Six additional bears were reported taken in defense of life/property.

Management Summary and Recommendations

The 1983 sport harvest of 88 bears is on the high side of the harvest parameter objectives established by the Alaska Board of Game and the Division of Game's long-term management plan which has been endorsed by the Board. The nonsport kill continues to be excessive, but no means are known to reduce that kill. The age of bears in the harvest will have to be

monitored closely in the next few years. Limited sex and age composition data are comparable to those from earlier years.

No changes are recommended in seasons or bag limits.

PREPARED BY:

Loyal J. Johnson
Game Biologist III

SUBMITTED BY:

Steven R. Peterson
Acting Management Coordinator

Table 1. Brown bear sport harvest, calendar years 1961-1983, Game Management Unit 4.

Calendar year	Total kill	% Kill in spring	% Males	% Nonresident kill	Mean skull size male	N	Mean age Male	N	Female	N
1961	39	72	79	62	24.7	12				
1962	44	73	67	66	23.9	8				
1963	26	69	73	58	22.4	9				
1964	55	73	69	44	23.7	13				
1965	68	63	66	52	23.5	11				
1966	76	65	68	67	22.4	24				
1967	69	61	68	48	23.0	20				
1968	50	74	78	32	22.2	30	5.7	9		
1969	65	66	75	55	22.7	46	6.5	32		
1970	72	79	72	51	22.0	50	6.7	44		
1971	79	78	71	52	22.5	47	7.5	47	8.0	19
1972	77	66	75	53	22.5	56	8.4	54	6.0	17
1973	99	72	68	40	21.6	64	7.2	65	7.9	31
1974	86	73	75	50	22.1	54	7.1	58	7.3	21
1975	105	72	70	57	22.3	69	7.5	68	6.0	28
1976	142	79	65	61	22.4	90	9.1	89	8.2	49
1977	67	84	71	55	21.6	43	6.8	44	8.0	17
1978	67	73	75	54	21.6	49	7.2	47	7.3	16
1979	51	69	68	71	21.1	31	6.3	29	6.0	13
1980	65	60	67	55	22.1	39	7.2	42	7.9	27
1981	62	65	68	61	21.3	40	6.3	42	7.8	20
1982	51	55	71	49	21.5	33	6.1	34	5.3	15
1983	88	57	78	49	21.7	60	6.6	62	8.4	15
Totals	1,603					898		766		288
Means		70	71	54	22.1		7.3		7.3	

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 5

GEOGRAPHICAL DESCRIPTION: Cape Fairweather to Icy Bay, Eastern Gulf Coast

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

No data were collected. However, based on interviews with residents of Yakutat, bear activity at the town dump was noticeably down from the previous several years. Game Division staff received no requests to remove problem bears from town or the nearby logging camp, previously a common complaint. Hunters, guides, and Commercial Fisheries Division staff reported seeing bears and evidence of bears in similar numbers as in past years. The low frequency of reported bears in and near Yakutat could be a reflection in a change in migratory or feeding patterns.

Between 30 May and 11 August, 1983, a series of scat surveys were conducted along the road from Dangerous River to the paved road in Yakutat (Table 1). Low and high densities of 1.0 and 7.0 scats per mile of road were enumerated on 30 May and 21 June 1983, respectively. While transect lengths were not standardized and old scats were not removed during survey efforts, the figures generated do give a crude indication of bear presence in a portion of the Yakutat Forelands.

Population Composition

No aerial or stream surveys were conducted in an attempt to enumerate and classify bears. Harvest statistics indicate that 22 of 33 (76%) known-sex bears were male. Interviews with persons hunting or otherwise observing bears did not indicate that the occurrence of cubs or yearlings was significantly different from recent years.

Mortality

No non-sport, illegal, or defense of life and property brown bear kills were documented during the reporting period.

Fourteen nonresident and 6 resident hunters took 20 bears (11 male, 8 female, and 1 of unknown sex) during the spring season. The fall harvest accounted for 11 male and 3 female bears by 9 nonresident and 5 resident hunters.

Ages of spring bears ranged from 2.4 to 15.4 years and 3.4 to 20.4 years for males and females, respectively. Males averaged 7.2 years old while females averaged 9.0 years of age. Male bears harvested in the fall ranged from 2.8 to 13.8 years of age while females ranged from 2.8 to 3.8 years old. Males and females in the fall harvest averaged 4.2 and 3.1 years old, respectively. Skull sizes for spring bears averaged 23.1 and 21.8 inches, respectively, for males and females; fall averages were 20.7 and 18.0 for male and female bears, respectively. Three bears taken during 1983 came from Subunit 5B, while 31 were taken from Subunit 5A.

Historical harvest data for 1961-1983 are shown in Table 2.

Management Summary and Recommendations

The harvest of brown bears in Game Management Unit 5 has increased steadily since 1974 (Fig. 1). The percentage of male and female bears taken in 1983 (67 and 33%, respectively) is essentially identical to the previous 10-year mean (68% male, 32% female). The age structure of the current year's harvest indicates that the age of males taken in 1983 was similar to the 15-year mean (1983 mean age = 5.9 years, 15-year mean age = 6.3 years); females were older in 1983 compared to the 15-year mean (7.4 years vs. 6.1 years). For 19 spring bears of both sexes, the 1983 mean age (8.0 years) was considerably higher than the 15-year mean (6.3 years); conversely, the mean age (4.0 years) of 12 fall bears (both sexes) was considerably lower than the 15-year mean (6.1 years).

Bear/human interactions appeared to occur less frequently than in 1983. Although bears did frequent the Yakutat landfill (albeit at a reduced level), Department biologists received no requests to remove troublesome animals. The perception that fewer bears were occurring near town might be due in part to a number of things: (1) the placement of a partial fence (electrified) around the city landfill which discouraged some bears from entering the dump; (2) human activity (logging, highway vehicles) along the Harlequin Lake road (Forest Highway 10) which disrupted migratory habits; (3) changing weather patterns which encouraged earlier spring plant growth and earlier hooligan (Thaleichthys pacificus) runs that are food sources for emerging bears; and (4) increased harvest or hunter pressure resulting in displacement of bears or a real reduction in their numbers near Yakutat.

At this time, no changes in season length or bag limit are deemed necessary for GMU 5. Future harvest and hunting pressure will be monitored closely.

PREPARED BY:

W. Bruce Dinneford
Game Biologist III

SUBMITTED BY:

Steven R. Peterson
Acting Management Coordinator

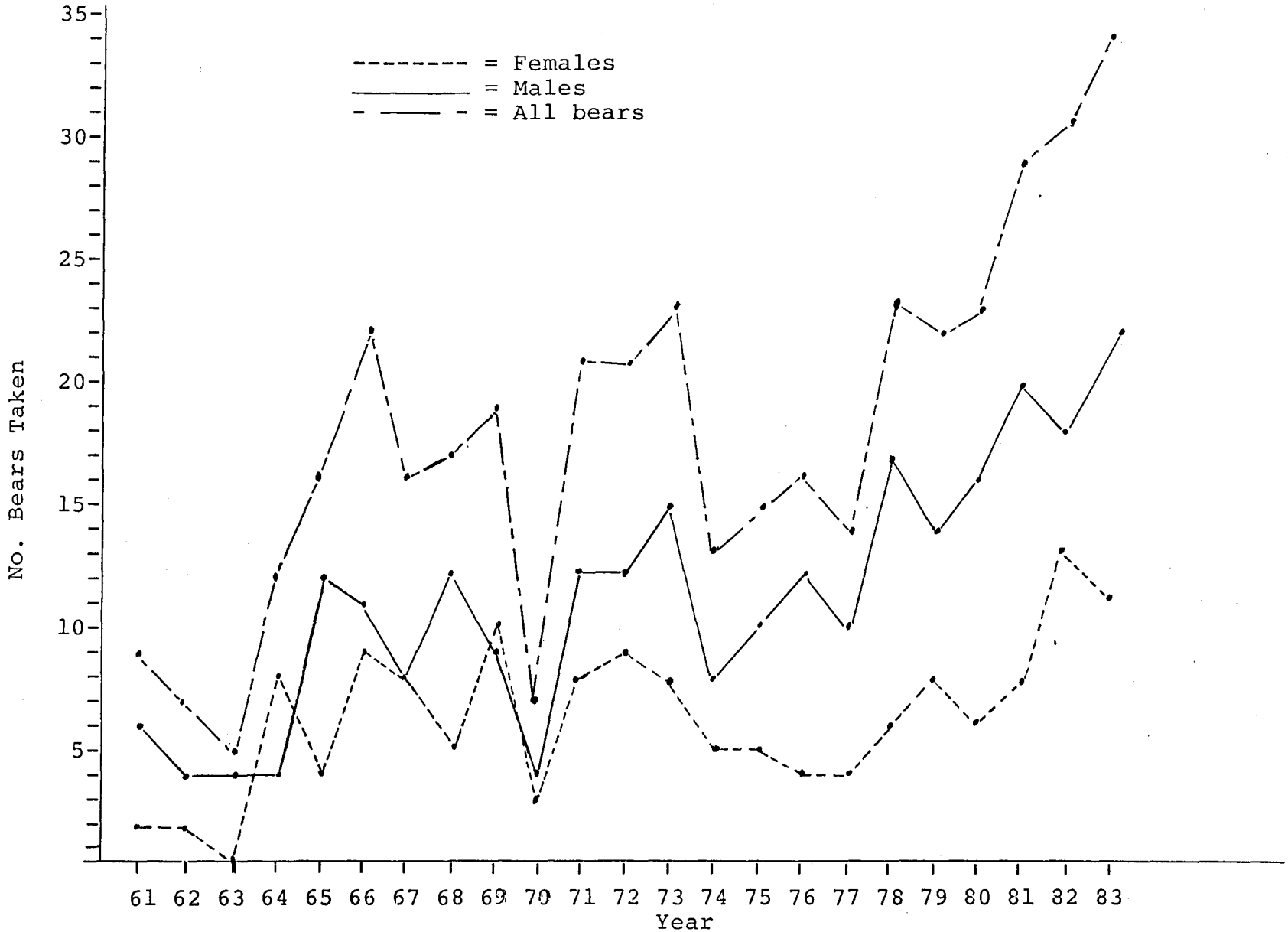


Figure 1. Historical Brown bear harvest, by sex, Game Management Unit 5, 1961-1983. (Total includes bears of unknown sex).

Table 1. Bear scat transects along Harlequin Lake Road, Yakutat Forelands, 1983.

Date	No. transect mi	No. scats	No. scats/mi	Survey Location
30 May	28.3	28	1.0/mi	4 mi west of Ahrnklin bridge to paved road
8 June	30.9	73	2.4/mi	Dangerous River bridge to paved road
2 June	15.0	105[a]	7.0/mi	Dangerous River bridge to 15 mi west of Dangerous River
11 August	21.9	70[b]	3.2/mi	Dangerous River bridge to Situk River

[a] Three scats classified as "old"; corrected to 6.9 scats/mi.

[b] Twenty-one scats classified as "old"; corrected to 2.2 scats/mi.

Table 2. Historical brown bear harvest, Game Management Unit 5, 1961-1983.

	Harvest				Mean Age		
Year	Male	Female	Unknown	Total	Male	Female	All
1961	6	2	1	9	--	--	--
1962	4	2	1	7	--	--	--
1963	4	0	1	5	--	--	--
1964	4	8	0	12	--	--	--
1965	12	4	0	16	--	--	--
1966	11	9	0	20	--	--	--
1967	8	8	0	16	--	--	--
1968	12	5	0	17	--	--	--
1969	9	10	0	19	7.2	5.6	6.1
1970	4	3	0	7	8.4	3.6	6.5
1971	12	8	1	21	5.4	3.4	4.6
1972	12	9	0	21	4.6	4.6	4.6
1973	15	8	0	23	8.4	9.0	8.6
1974	8	5	0	13	4.2	7.0	5.5
1975	10	5	0	15	3.6	4.6	3.9
1976	12	4	0	16	6.9	7.1	7.0
1977	10	4	0	14	8.2	3.0	6.7
1978	17	6	0	23	7.1	7.2	7.1
1979	14	8	0	22	6.3	7.4	6.7
1980	16	6	1	23	5.1	3.7	4.7
1981	20	8	1	29	5.5	6.0	5.6
1982	18	13	0	31	7.6	6.8	7.2
1983	22	11	1	34	5.9	7.4	6.4
Mean	11	6	<1	18	6.3	6.1	6.2

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 6

GEOGRAPHICAL DESCRIPTION: Prince William Sound and North Gulf Coast

PERIOD COVERED: 1 January 1983-31 December 1983.

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Sufficient data to determine current status or trend of brown bears in Unit 6 were not available.

Mortality

The Unit 6 brown bear sport harvest was 38 bears: 26 males and 12 females. Two nonsport kills were reported during the year. Twenty-one bears were killed during the spring season and 17 during the fall season.

Males taken in 1983 averaged 23.1 inches in skull size and 6.7 years of age. Females averaged 22.2 inches in skull size and 10.1 years of age.

Distribution of 1983 brown bear harvest in Unit 6 was as follows: Montague Island, 4; Hinchinbrook Island, 3; Valdez to Cordova, 9; West Copper River Delta, 4; and East of Copper River, 18.

Management Summary and Recommendations

The reported harvest of 38 bears was 11 bears above the 1982 harvest and 7 bears above the 23-year average. It was also the 1st harvest in 6 years to exceed the average. The spring harvest was about average, and the fall harvest was considerably (42%) above average.

Analysis of harvest data indicated average to above average figures on percentage of males taken and mean age and skull size of both sexes. The distribution of harvest was near normal, with above average harvest in 2 areas: east of the

Copper River and Valdez to Cordova. The harvest by nonresidents was slightly below average.

For the 2nd year, Subunit 6B opened earlier than the remainder of Unit 6. Five bears were taken during this period (1 September-10 October. Three bears were taken by nonresidents and 2 by residents. The earlier opening had little effect upon the total harvest.

The brown bear resource in Unit 6 has received moderate pressure in recent years. It is recommended that the entire Unit 6 fall season open on 1 September.

PREPARED BY:

Julius L. Reynolds
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 7 and 15

GEOGRAPHICAL DESCRIPTION: Kenai Peninsula

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Estimates of brown bear densities in Units 7 and 15 are currently not available. However, based on historical harvest data and on incidental bear observations made by department personnel, it is believed that bear populations have remained relatively stable over the past 2 decades.

Mortality

Three males and 4 female brown bears were reported killed by sport hunters during the 1983 season. An additional adult female was killed in defense of life and property (DLP). Examination of past records revealed that 34 DLP brown bears have been killed since 1970. It is particularly noteworthy that 11 of these bears have been killed since 1980.

A preliminary analysis of the DLP bears killed in Unit 15 since 1972 has been completed. The sex composition was 5 males (24%) and 14 females (76%). A statistical comparison indicated the sex composition of DLP bears was not significantly ($P > 0.10$) different from that of sport-killed bears. The mean age of males was 17.9 years ($\underline{N} = 4$) and females was to 6.6 years ($\underline{N} = 12$) for DLP type kills. There were 6 females that were 6.5 years of age or older, and at least 3 of these mature females were accompanied by cubs when killed. Seven DLP bears were killed at sites in close proximity to human dwellings and 10% were killed at remote sites. A minimum of 4 of 8 brown bears killed in July and August were in close proximity to streams or rivers that supported spawning salmon at the time. Bears killed in DLP were taken in each month from April to October, the greatest number killed during August. No seasonal trend was revealed in the DLP brown bear harvest; however, this might be the result of small sample size.

Management Summary and Recommendations

Brown bears are relatively abundant in parts of the Kenai Peninsula. The 19-year mean annual harvest, prior to the introduction of spring season, was 6 bears. Since 1980, the mean annual harvest has been 13.5 bears; the maximum annual harvest for this period was 15 bears.

The rising number of DLP brown bears killed in recent years is a potential management problem. During the past 5 years, 1 brown bear was killed in defense of life and property for every 4 bears taken during the hunting season.

Examination of historical DLP information was undertaken to determine whether or not this data could provide management information relative to conflicts between brown bears and humans. The results of the preliminary analysis of the DLP bear data are largely inconclusive. It should be noted, however, that this data set suggests several trends. For instance, female brown bears occur more frequently in the DLP harvest (75%) than in the sport harvest (45%), although this difference was not significant at the 0.05 level. When males did occur in the DLP harvest, they tended to be very old individuals (i.e., >15 years). Conversely, males <6.5 years of age were totally absent from the DLP harvests. The data also indicate that the frequency of adult females with cubs may occur at a higher level than adult females that are without young. Unfortunately, past documentation on sealing certificates such as the presence or absence of cubs has been neglected. Finally, DLP kills are most common in July and August, and at least half of the bears killed during these months were closely associated with spawning salmon.

An interagency brown bear task force including representatives from the Alaska Department of Fish and Game, Chugach National Forest, and the Kenai National Wildlife Refuge was formed in 1983. The purpose of this task force is to analyze existing information on the Kenai Peninsula brown bear population and to identify management problems and research needs.

PREPARED BY:

David A. Holdermann
Game Biologist II

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 8

GEOGRAPHICAL DESCRIPTION: Kodiak and Adjacent Islands

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations Nos. 23 and 24.

Population Status and Trend

The sex and age composition of the 1983 brown bear sport harvest was within the range of data recorded for the previous 22 years. The population appeared to be stable or slightly increasing on Kodiak Island. Increased take of female bears from Afognak and adjacent islands suggested that the harvest could be approaching the maximum sustainable level.

Population Composition

One hundred and sixty bears were counted during aerial composition surveys of the Uganik alpine transect. These surveys were conducted by personnel from the U.S. Fish and Wildlife Service during July. These bears included 59 (37%) single bears, 36 (22%) maternal females, 37 (23%) yearlings and 28 (18%) cubs-of-the-year. Survey information indicated that representation of cubs-of-the-year was below the previous 5-year average of 26%, and representation of yearlings was above the 5-year average (unpublished annual narrative report, Kodiak National Wildlife Refuge, 1983). Observations of females with cubs-of-the-year were also lower than expected on the northern portion of Kodiak Island where a brown bear study is being conducted by the department.

Mortality

Hunters killed 156 brown bears during 1983, 96 males (62%) and 60 females (38%). Ninety-nine bears were killed during the spring season; 65 were males and 34 were females. Fifty-seven bears were killed during the fall season; 31 were males and 26 were females. Distribution of brown bear kill by management subunit was: Afognak/Raspberry/Shuyak Islands, 24 (10 males and 14 females); northeast Kodiak Island, 15 (12 males and 3 females); southeast Kodiak Island, 20 (14 males and 6 females); southwest Kodiak Island, 72 (42 males and 30 females); and northwest Kodiak Island, 25 (18 males and 7 females).

The mean age of 94 males was 7.4 years, above the 6.4-year mean age for the period 1969-1983. Eighteen males (19%) were 10 years of age and older. The oldest male killed was 22.4 years of age. The mean age of 59 females was 8.5 years, above the 7.1 year mean age for the period 1969-1983. Thirty-one females (52%) were 5 years of age and older. The oldest female killed was 29.8 years.

Ten mortalities were recorded from sources other than the sport harvest. Five bears, 2 males, 2 females, and 1 sex unknown were killed in defense of life or property. Four bears, 1 female and 3 sex unknown were found dead of unknown causes. One female died by drowning during a capture attempt. The total recorded brown bear mortality in Unit 8 during 1983 was 166 bears.

Bear hunters reported wounding 5 bears during the hunting season. Another bear was reported to have been shot by a hiker. Several unconfirmed reports of bears being wounded by deer and elk hunters were also received. The remains of a radio-collared bear was found this year; the bear was suspected to have been fatally wounded during the 1st week of October 1982.

A total of 501 permittees reported hunting brown bears, a 13% increase in hunting pressure over that recorded the previous year. Hunter success was 32%. Of these permittees, 283 hunted in registration hunts and 218 hunted in drawing hunts.

Management Summary and Recommendations

The sport harvest of 156 brown bears was 15% higher than the mean annual kill of 135 bears taken since 1961. It was the 2nd highest sport harvest within the past 10 years. Characteristics of the harvest indicated that the brown bear population was stable. The relatively high mean age of males killed during 1983 suggests that large trophy bears continue to be represented in the population. Although the female take was above average, 61% of the harvest was males.

The harvest guideline of 20 bears in management subunit 8-01 (Afognak/Raspberry/Shuyak Islands) was exceeded by 4. Three additional bears were killed in defense of life or property by deer and elk hunters. The total mortality therefore was 27 bears, 10 males (38%), 16 females (62%) and 1 bear of unknown sex. In addition to exceeding the harvest guideline, there was a higher take of adult females. For these reasons, I recommend the number of permits be reduced for management subunit 8-01 during the 1984 season.

The harvest guideline of 60 bears in management subunit 8-04 (southwest Kodiak Island) was exceeded by 12. Three additional nonsport mortalities were also recorded. Total mortality, therefore, was 75 bears, 43 males (57%) and 32 females (43%). The mean age of 42 males was 7.6 years compared to 6.5 years for the period 1969-1983. Ten of the 32 females (31%) were ≥5 years of age. The mean annual take of females ≥5 years of age during the period 1969-1983 was 6 bears. Although the mean age of males was above average during 1983 and the take of mature females was not considered excessive, continued harvest of the population in excess of guideline levels should be prevented. It is generally acknowledged among researchers specializing in bear population biology that sex and age characteristics of the harvest are imperfect indicators of actual population trends. Therefore, a reduced season or a reduction in hunting permits should be implemented if the guideline harvest continues to be exceeded.

PREPARED BY:

Roger B. Smith
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9

GEOGRAPHICAL DESCRIPTION: Alaska Peninsula

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

The only quantitative data to indicate trends in bear population composition and abundance are from aerial surveys conducted along salmon streams where bears congregate to feed. There are several unquantified biases and problems with these surveys, but we can compare standardized surveys in specific areas as indicators of population status. The Black Lake study area was surveyed during 8 years from 1962-69. The highest single survey from each of these years averaged 103 bears (range 67-123) with an average of 38 bears counted per hour (Table 1). In 1982 and 1983, surveys in this area were again flown using the same procedures. The best single count in 1982 was 148 (51 bears per hour), and the best single count in 1983 was 173 (56 bears per hour). Combining the 6 surveys of 1982 and 1983, an average of 152 bears was seen, about 50% more animals than the average for 41 surveys made during the 1960's. Recent surveys along salmon streams conducted by the U. S Fish and Wildlife Service (FWS) on the Izembek National Wildlife Refuge (NWR), Becharof NWR, and near Ugashik (Alaska Peninsula NWR) also reflect a similar trend of more bears seen. Although these bear composition surveys were not designed to measure population densities, the noted increase in sample sizes over past years points to a growing bear population.

Population Composition

Recent bear composition surveys indicated a change in the age and sex composition of the Alaska Peninsula bear population. Of 4,071 bears classified from 1962-1969, 24% were females with young, 51% were offspring and 24% were single bears. In replicate surveys conducted since 1980, 3,907 bears were classified; 45% were single bears. Results of these surveys indicated there have been no noticeable changes in the absolute number of females and young, but the number of single

bears has increased markedly. This suggests that the survival rate for cubs and subadult bears has recently increased.

The killing of single bears is legal while bears in family groups (females and young) are protected. Bear populations within sanctuaries (e.g., McNeil River and Katmai NP) normally have a much higher percentage of single bears than do hunted populations. Although factors other than hunting (e.g., amount of available food and the number of adult males which might affect predation rates on young) may influence composition of bear populations, the percentage of single bears observed during composition surveys may provide an index to harvest rate.

For example, from 1970 to 1983, the "unhunted" populations on the Alaska Peninsula averaged 59% single bears. The hunted population has fluctuated between 15% and 56% for single bears observed. The earliest bear composition surveys on the Alaska Peninsula were conducted during a period of very light hunting pressure (1958-61) and reflected a high percentage of single bears (>45%) in the population. During the mid-1960's, when hunting pressure increased and harvests more than doubled, the proportion of single bears observed during composition surveys decreased to an average of 25%. In the Meshik to Port Moller area, where hunting was particularly intense, single bears averaged 16% in 1967 and 1968. After hunting restrictions were invoked, the percentage of single bears increased and reached 38% at Black Lake in 1970 and 51% south of Port Moller in 1969.

By 1982, when bear composition surveys had been resumed in all the established trend areas, the percentage of single bears ranged from 31% to 51% in 1982 and 1983. An apparent decline in the percentage of single bears in trend areas north of Port Moller since 1982 cannot be explained and warrants careful consideration pending results of 1984 surveys.

Mortality

Sport hunters killed 199 brown bears in 1983; all but 2 were taken during the fall season (Table 2). The fall harvest was 61% males, which was above the average of 57% males for the past 22 fall seasons.

In addition to the take by sport hunters, 10 bears were reported taken in defense of life and property. The number of unreported defense kills was estimated at 20 bears. Thus, the total kill was approximately 230 bears for 1983.

Management Summary and Recommendations

The registration permit hunt in the Naknek drainage was designed to minimize bear-human conflicts in the most heavily settled portion of Unit 9. In 1983, only 1 bear, a female, was harvested during the spring and fall seasons. Additionally, another female with 2 cubs was accidentally killed during a bear control study; and at least 2 bears were killed in defense of life and property. The registration permit hunt has been conducted for the past 8 years, and has proven partially successful in reducing the threat of nuisance bears. The bear population in the Naknek drainage appears healthy and well-distributed.

The registration permit hunt in the Cold Bay area serves a similar management objective in that community. Two females were taken during the spring season, and 1 male was taken during the fall season. The harvest of 3 bears was about average for the past 3 years. Izembek National Wildlife Refuge staff expressed concern that the number of bears in the immediate vicinity of the town may now be depressed too much. However, until this observation can be substantiated, no changes in this registration hunt are recommended. It is believed that the limit of 10 valid bear hunting permits and the provisions for emergency closure provide adequate safeguards.

That portion of Unit 9 north of the Naknek drainage has traditionally been lightly hunted due to limited access. The fall harvest since 1975 has averaged 26 bears, and during 1983 the harvest was 29. This area (9-01) has traditionally had the lowest proportion of nonresident hunters (Table 3). Fall harvest statistics for area 9-02 and 9-03 (Table 3) show increases in percent of harvested males and average ages of both males and females. The harvest in area 9-04 increased by 30% over the previous 4 fall seasons, but other harvest parameters are within acceptable limits.

Recent bear management programs on the Alaska Peninsula have been successful in several ways. Harvest data, trend count surveys, and observations by local residents and guides indicate increased brown bear population. The 150-bear harvest guideline for areas south of the Naknek River has ensured that the kill did not exceed annual recruitment and has allowed more males to reach maturity. Seasons remained standardized for the past 8 years, allowing collection of consistent harvest data, and enabling hunters and guides to plan hunts well in advance. Preliminary results of a questionnaire sent to successful hunters in 1983 suggested that the majority of hunters were interested in taking a large bear. However, almost all were satisfied with their hunt, with the bear they took (regardless of size), and with the number of bears they observed.

Many residents of the Alaska Peninsula believe that bear management may have been too successful; i.e., that flourishing bear population has led to problems within villages and at other remote residences. Circumstantial evidence also suggests that brown bear predation on moose calves may be the most important factor contributing to the continued moose population decline in Subunit 9E.

The 150-bear harvest guideline has been exceeded by an average of 9% for each of the past 4 years without detrimental effects on the population. The Board of Game dropped this quota in 1982. Factors which prompted the system of alternate year spring and fall seasons (which began in 1974) were: a high annual average of 239 bears taken from 1971-1973; steadily increasing proportions of adult (≧5 years of age) females in the harvest (1969-1971 = 12%, 1972-1975 = 23%); poor salmon escapement; and a high harvest rate of marked bears near Black Lake.

Circumstances have changed, but experiences of the early 1970's can be used to reevaluate bear management objectives and harvest guidelines. Under current environmental conditions (i.e., high salmon escapements and undisturbed habitat), the Unit 9 bear population can be managed at long-term maximum sustained yield under the following guidelines:

1. Both spring and fall seasons should be maintained under the current alternate regulatory year system.

2. Season length and timing should be used to manipulate harvest levels and population composition.

3. The fall 1985 season should be expanded from 7-21 Oct to 1-21 Oct (pending analysis of stream surveys and 1983-84 harvest data). The length of the spring season should remain unchanged to limit the take of adult males.

4. Reevaluation of the extended fall season should occur if the total calendar year harvest for all of Unit 9 exceeds 230 bears in each of 3 consecutive open seasons, or if the number of adult females entering the fall kill exceeds that of adult males for 2 consecutive seasons.

We anticipate that an additional week of hunting added to the fall 1985 season and subsequent fall seasons would result in harvests within the acceptable limits. However, we may opt for no changes in the current season length if results of 1984 surveys and harvest data for the current regulatory year change markedly.

PREPARED BY:

Richard A. Sellers
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

Table 1. Results of brown bear composition surveys from Black/Chignik Lakes trend count area, 1958-1983.

Date	Females w/young N	%	Cubs and yearlings N	%	Singles N	%	Total sample	Best survey No. of bears	Best survey Bears /hr	No. replicate counts
8/58								76		
8/59								73		
1962	439	26	888	52	391	23	1718	118		27 counts
8/65	65	28	135	57	36	15	236	123	49.2	2 counts
8/66	24	22	51	47	33	31	108	108	43.2	1 count
8/67	42	27	86	55	27	17	157	82	30.4	2 counts
8/68	30	23	73	57	25	19	129	67	20.9	3 counts
8/69	148	22	341	51	174	26	663	122	44.4	6 counts
fall/1970	70	22	137	43	114	36	321	126	4.0	3 counts
8/74	39	23	89	52	44	26	172	95	43.0	2 counts
8/82	53	19	116	41	113	40	282	148	53.8	2 counts
8/83	139	22	293	46	199	32	631	173	55.8	4 counts

Table 2. Alaska Peninsula brown bear sport harvest showing the number of bears killed by year, season, mean age, and percentage of males in the harvest, 1970-1983.

	Yearly harvest			Fall harvest			Spring harvest		
					Mean age			Mean age	
Year	M	F	Total[a]	% males	M	F	% males	M	F
1970	103	50	158	59	5.6	7.2	78	8.2	6.6
1971	122	63	195	59	5.7	5.5	83	8.6	4.8
1972	154	119	279	53	6.2	7.8	69	8.4	9.3
1973	138	98	242	50	5.6	7.3	70	6.4	5.7
1974	75	66	141	53	5.5	7.5	--	--	--
1975	120	96	224	52	5.6	7.0	64	6.9	7.2
1976	108	41	154	--	--	--	72	7.6	6.6
1977	108	77	189	58	4.5	7.0	--	--	--
1978	133	47	183	--	--	--	74	7.0	6.7
1979	109	55	167	66	5.1	6.0	--	--	--
1980	139	62	203	--	--	--	69	7.1	7.0
1981	106	84	192	55	5.7	5.6	--	--	--
1982	134	75	211	--	--	--	65	6.6	7.6
1983	119	78	199	61	5.6	8.0	--	--	--

[a] Includes bears of unknown sex.

Table 3. Alaska Peninsula brown bear sport harvest for fall seasons by subunit and year, showing mean age, percentage of males in the harvest, and percentage taken by nonresident hunters.

Year/ subunit[a]	Total kill	% male	% nonres. kill	Mean age (yr) M	N	F	N	% >5 yrs M	F
Subunit 9-01									
1975	24	61	54	7.5	14	6.0	9	50	44
1977	27	63	44	4.6	16	6.0	9	31	44
1979	24	57	71	6.6	13	7.0	9	31	67
1981	27	70	33	7.9	19	7.6	8	53	62
1983	29	57	59	5.4	16	8.4	12	19	50
Means	26	62	52	6.4		7.2		37	53
Subunit 9-02									
1975	46	54	74	5.6	25	7.9	21	24	57
1977	71	61	73	4.3	38	6.9	25	21	50
1979	66	62	79	5.0	40	5.5	24	38	30
1981	65	52	80	4.6	33	4.6	31	18	13
1983	60	64	72	5.4	38	9.1	21	26	67
Means	62	59	76	5.0		6.8		25	43
Subunit 9-03									
1975	25	46	88	4.1	11	5.8	13	27	31
1977	35	60	80	4.7	20	7.6	14	36	50
1979	30	67	80	5.0	20	4.2	10	30	20
1981	46	50	70	4.7	21	4.6	23	33	27
1983	36	67	64	6.2	24	5.7	12	46	33
Means	34	58	76	4.9		5.6		34	32
Subunit 9-04									
1975	60	48	62	5.1	27	7.1	29	26	50
1977	53	49	70	4.4	25	7.1	24	20	44
1979	45	77	73	4.8	34	7.5	10	24	40
1981	50	57	78	6.4	27	7.5	20	29	52
1983	68	57	79	5.8	38	7.4	28	37	39
Means	55	58	72	5.3		7.3		27	45

[a] Subunit designations for management purposes only.

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 10

GEOGRAPHICAL DESCRIPTION: Unimak Island

PERIOD COVERED: 1 January 1983-31 December 1983.

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

On 27 August 1982, staff of the Izembek National Wildlife Refuge conducted an aerial survey of the north side of Unimak Island and classified 55 bears, compared to 85 in 1982, 77 in 1981, 92 in 1980, and 75 in 1979. Of the 55 bears observed, 29 (53%) were alone, 5 were females with 10 cubs-of-the-year, and 4 were females with 7 older young. Although the sample size for 1983 was smaller than previous years, it is doubtful that an actual decline in population size has occurred.

Mortality

Two male bears were killed by hunters during the spring season, and 1 male and 3 females were killed during the fall season. No data were available on other causes of mortality.

Management Summary and Recommendations

Brown bear hunting on Unimak Island is limited by state permits and by federal wilderness regulations limiting aircraft access to beaches and existing runways.

During the spring season, 4 of 7 permittees hunted. The 2 successful hunters hunted a total of 24 days and saw a total of 38 bears. The 2 unsuccessful hunters hunted 18 days and saw 12 bears. During the fall season, 6 of 8 permittees hunted. The 4 successful hunters hunted a total of 24 days, and saw a total of 40 bears. The 2 unsuccessful hunters hunted 14 days and saw 16 bears. Under the current management system, Unimak Island continued to provide a high-quality wilderness experience with good opportunities for hunters to select the type of bear they desire.

No changes in seasons or bag limits were recommended.

PREPARED BY:

Richard A. Sellers
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11

GEOGRAPHICAL DESCRIPTION: Wrangell Mountains

PERIOD COVERED: 1 January 1983-31 December 1983.

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Standardized surveys of brown bears have not been conducted in Unit 11. Frequency of observation suggests brown bears are abundant. No population trends were evident.

Mortality

Eight brown bears, 6 males and 2 females, were reported killed during the hunting season. The mean age of the harvest was 8.3 years, up from the 15-year average of 7.4 years of age. The mean skull size for males was 22.4 inches and for females was 20.3 inches. Resident hunters took 7 of the 8 bears.

Management Summary and Recommendations

Since 1979, much of Unit 11 has been closed to sport hunting under federal regulations which limit hunting activity in Wrangell St. Elias National Park/Preserve. The result of these restrictive hunting regulations has been a 54% decrease in the brown bear harvest. The harvest for the last 5 years averaged 7.6 brown bears per year vs. an average of 16.3 bears per year for the 18 years previous to 1979.

Hunting has little influence on bear populations over much of the unit and natural mortality factors are believed to be controlling bear numbers.

No changes in seasons or bag limits were recommended.

PREPARED BY:

Robert W. Tobey
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 12

GEOGRAPHICAL DESCRIPTION: Upper Tanana and White Rivers

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Grizzly bears are relatively abundant and well distributed throughout Unit 12. No current trend in the bear population is obvious.

No standardized surveys of bears have been conducted in the unit. However, based on data from a study in another part of the Alaska Range, the Unit 12 bear density is likely 1 bear/15-20 mi^2. Assuming this density, the Unit 12 grizzly population is estimated at 430-570 bears.

Mortality

Hunters reported taking 13 grizzly bears during this reporting period compared to the 23-year average of 17 bears. Of the 13 bears, 1 was taken in the spring and 12 were taken in the fall. Males (9) comprised 69% of the harvest, and females (4) 31%. The harvest of 13 bears is only 3% of the minimum population estimate of 430 bears, or well below the 5% sustained yield rate assumed for grizzlies.

Mean skull size for males was 20.7 inches and mean age was 6.3 years, compared to 23-year averages of 20.8 inches and 7.2 years, respectively. Mean skull size for females was 18.9 inches and mean age was 8.6 years, compared to the historical averages of 19.2 inches and 7.5 years, respectively. The mean age of males taken which were >5 years old (2) was 12.5 years, compared to the historical average of 11.8 years. For females, mean age was 13.8 years in 1983, compared to the 11.4 years historical average.

Nonresident hunters took only 3 bears, or 23% of the harvest, in 1983, compared to the 56% historical average.

Management Summary and Recommendations

The grizzly bear population in Unit 12 is estimated to contain 430-570 bears with no obvious trend. Annual harvests have not increased as a result of longer seasons and more liberal bag limits instituted in recent years. Annual harvests appear to be below the maximum sustained yield of 5% assumed for grizzly bear populations.

No change in bag limit is recommended, but the season could be lengthened slightly to permit a larger harvest.

PREPARED BY:

David G. Kelleyhouse
Game Biologist III

SUBMITTED BY:

Jerry D. McGowan
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 13

GEOGRAPHICAL DESCRIPTION: Nelchina Basin

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

In 1979, the brown bear density estimate for portions of Unit 13 was 1 bear/16 mi^2 (Miller and Ballard 1982). This density is typical for interior grizzly bear populations. Available data suggest little change in the population status.

Population Composition

Susitna research findings since 1981 (Miller 1984) have indicated a mean litter size of 2.1 cubs-of-the-year for 19 litters and 1.6 yearlings for 22 litters. Current sex and age data show little change from figures previously reported (Lieb 1984).

Mortality

The 1983 harvest was 117 bears, the highest ever recorded for Unit 13. The harvest composition included 62 (55%) males, 51 (45%) females and 4 sex unknown. The spring harvest was 36 bears and the fall harvest was 81 bears. Nonresident hunters killed 39 (33%) bears.

The average age of all males in the harvest increased from 5.3 years in 1982 to 6.2 years in 1983, and was near the 15-year average for males of 6.0 years of age. The average age of females declined from 8.7 years in 1982 to 7.2 years in 1983, but was still above the 15-year average of 6.9 years of age. The average age for all bears taken in 1983 was 6.6 years, near the 15-year average for both sexes of 6.4 years of age.

The harvest rate of marked bears indicated an exploitation rate of 8% and suggested an even higher rate in recent years (Miller, pers. commun.). Cumulative natural mortality rates reported by Miller (1984) for the 5-year period from 1978 were

41% (11 of 27) for cubs-of-the-year and 33% (5 of 15) for yearlings.

Management Summary and Recommendations

The reported kill of 117 brown bears during 1983 was appreciably higher than the average of 80 bears for the period 1980-82. Public sentiment favors continued liberalization of bear hunting seasons and bag limits. Currently, numerous bear conflicts involving damage to cabins and homesites are reported each year. An increase in the frequency of these conflicts is due in part to an expansion of human settlements in remote areas. Additionally, the public favors hunting seasons that would maintain high bear harvest and potentially reduce predation on moose.

Literature Cited

Lieb, J. W. 1984. Unit 13 brown/grizzly bear survey-inventory progress report. Pages 67-69 in J. A. Barnett, ed. Annual report of survey-inventory activities. Part I. Black bears and brown bears. Vol. XIV. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-22-1 and W-22-2. Job 17.0 and 4.0 Juneau. 96pp.

Miller, S. D. 1984. Big Game Studies. Vol. VI. Black bears and brown bears. Susitna Hydroelectric Project. Phase II Prog. Rep. Alaska Dep. Fish and Game. Juneau.

Miller, S. D., and W. Ballard. 1982. Density and biomass estimates for an interior Alaskan brown bear population. Can. Field-Nat. 96(4):448-454.

PREPARED BY:

Robert W. Tobey
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 14

GEOGRAPHICAL DESCRIPTION: Upper Cook Inlet

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

No data were available.

Mortality

Eight brown bears, 6 males and 2 females, were killed during the fall hunting season and 2 bears, both females, were killed in defense of life and property. There were no sport-harvested bears reported killed during the spring season.

Management Summary and Recommendations

There is little interest in brown bear hunting in this unit. All brown bears killed by sport hunters were taken during the moose hunting season and are believed to have been harvested incidental to moose hunts. Unit 14 has never experienced a large brown bear harvest. Between 1961 and 1971, the average annual harvest was 10 brown bears. From 1972 through 1983, the average annual harvest was 5 brown bears. Thirty-seven bears have been killed in defense of life and property since 1961.

Due to the low annual harvest, mean ages and mean skull sizes are of limited value in estimating trends in population status. The annual kill of brown bears is low, and therefore, we believe, has little impact on population composition.

No changes in seasons or bag limits were recommended.

PREPARED BY:

Jack C. Didrickson
Game Biologist III

Nicholas C. Steen
Game Biologist II

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 16

GEOGRAPHICAL DESCRIPTION: West Side of Cook Inlet

PERIOD COVERED: 1 January 1983-31 December 1983.

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Observations of bears by department staff and the public indicate an abundant population of brown bears in Unit 16.

Mortality

Twenty-four brown bears were reported killed by sport hunters during the 1983 season. Twenty-three bears, 8 males, 12 females, and 3 of unknown sex were killed during the fall season. The mean age of these bears was 6.7 years (N = 8) for males and 4.5 years (N = 12) for females. A single 8-year old male was killed during the spring season.

Management Summary and Recommendations

The mean age of bears in the harvest continues to fluctuate from year to year. These fluctuations are probably due to the small sample size rather than a trend in age composition.

I recommend that season dates run from 1 September through 25 May. This will allow hunters more time to plan their hunts in accordance with freeze-up and break-up conditions. Weather conditions vary greatly over the unit and the additional harvest should not be detrimental to the bear population.

PREPARED BY:

James B. Faro
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 17

GEOGRAPHICAL DESCRIPTION: Northern Bristol Bay

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

The only data available to evaluate the density of brown bears in Unit 17 were derived from observations made during salmon spawning and waterfowl surveys. These observations indicated a high density of brown bears in Subunits 17A and 17C. Brown bear density in Subunit 17B where most hunting pressure occurs was unknown.

Mortality

The total brown bear kill by sport hunters during 1983 was 20 bears, 11 males and 9 females. Six bears were taken during the spring season and 14 during the fall season. Nonresidents took 55% of the reported sport harvest. Four bears were also reported killed in defense of life or property. Seventeen of the 20 bears killed by sport hunters were taken in Subunit 17B, primarily from the Mulchatna and King Salmon River drainages. Cementum ages were determined from each of the 20 bears; however, sample size was too small to compare meaningful trends in age composition.

Management Summary and Recommendations

No data exist to estimate the size of the bear population; however, general observations of bear density suggest the population in most areas of the unit was high. Harvest levels in Subunits 17A and 17C have been extremely low. Most bears killed in these 2 subunits were taken in defense of life and property. Because populations appear high, I recommend the fall season be lengthened from 15 to 30 days.

PREPARED BY:

Kenton P. Taylor
Game Biologist III

SUBMITTED BY:

Leland P. Glenn
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 18

GEOGRAPHICAL DESCRIPTION: Yukon-Kuskokwim Delta

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulation Nos. 23 and 24.

Population Status and Trend

Although data needed to properly evaluate the status of grizzly bears in Unit 18 are scanty, reports from Department personnel and members of the public indicate that bears are moderate in density and stable in number. The highest densities of grizzly bears are found in the Kilbuck Mountains southeast of the Kuskokwim River and in the Andreafsky and Chuilnak Mountains north of the Yukon River. Although bears are occasionally sighted in the vast lowland of the Yukon-Kuskokwim Delta lying between the 2 population centers, the area constitutes marginal habitat for bears and densities are very low.

Bear surveys were not conducted during the reporting period, but observations of bears were noted during other field activities. Unit 18 contains approximately 11,000 mi^2 of fair-to-excellent grizzly bear habitat. Of this, approximately 5,000 mi^2 lie in the Andreafsky-Chuilnak Mountains and 6,000 mi^2 in the Kilbuck Mountains. Using density estimates derived from research studies conducted in the western arctic, interior Alaska, and the Alaska Peninsula, we believe the overall density of bears in these 2 areas probably lies between 1 bear/16 mi^2 and 1 bear/35 mi^2. Based on these density estimates, Unit 18 contains 300-700 bears.

The above population estimates are admittedly crude. Density estimates from research studies conducted in other areas of the state may not be applicable to Unit 18 bear populations. Unit 18 populations, unlike arctic and some interior populations, prey heavily on salmon but not ungulates. I believe that Unit 18 population densities are intermediate between the less productive populations to the north and the highly productive populations of Units 9 and 17. Density and productivity of the Andreafsky Mountains population are probably more similar to those of Unit 22 populations than to the

Kilbuck Mountains population. Likewise, the Kilbuck population is probably more similar to Unit 17 and northern Unit 9 populations than to the Andreafsky population. Additional research is needed to better evaluate the density and productivity of the 2 major bear populations in the Unit.

Mortality

According to sealing certificates and reports from local residents, 16 bears were harvested by hunters, and 2 were shot in defense of life and property during this reporting period. Five bears (3 males and 2 females) were harvested during the spring season, and 11 bears (8 males and 3 females) were harvested during the fall season. Three bears were taken from the Andreafsky and Chuilnak Mountains and 11 were taken from the Kilbucks. The 2 bears shot in defense of life and property were taken from the lower Yukon River below St. Mary's. Guided, nonresident hunters took 75% (12) of the harvest. Although the harvest by hunters increased greatly after guides began to consistently work the area in 1979, it has never exceeded the high of 24 bears taken in 1981 (Table 1). Assuming that 5% of the population can be harvested annually, Unit 18 should produce a harvestable surplus of 15-35 bears. Because hunter harvest has averaged about 16 bears annually since 1979, safe harvest limits probably have not been exceeded. However, the number of bears killed in defense of life and property and by subsistence hunters is unknown. Local residents are reluctant to report such kills, because they fear trouble with the law. Consequently, most bears taken in defense of life and property or for subsistence are not reported. We believe, however, that the unreported kill is low. Most fish camps and villages are located in marginal bear habitat and bear encounters are infrequent. In addition, many local residents (particularly those residing in Yukon River villages) do not consider grizzly bears to be a subsistence resource.

Age structure of the Unit 18 harvest since 1979 is consistent with that of harvests elsewhere in the state (Table 1). Mean age of males harvested in spring was greater than mean age of males harvested in fall. Because old males emerge from their dens earlier than young males, this difference is not surprising. Females harvested in fall were older than males harvested in fall. The converse was true in spring; males were older than females. Because older females are likely to have cubs in spring and leave their dens last, they are less vulnerable to hunting than are other bears. Lone females encountered in spring are likely to be nonbreeding, younger animals. During fall, the increased presence of older females without cubs should increase the age of females taken. Also,

hunters are more likely to take a bear opportunistically in fall and may not be as selective for larger males.

Management Summary and Recommendations

Unreported taking of bears in defense of life and property and for subsistence should be addressed. Local residents need to be aware of related laws and reporting responsibilities. A fish camp and village visitation program by Department personnel should be undertaken to discuss the problem and possible solutions.

Although the Unit 18 harvest is currently low, a future increase is likely. Open terrain characterizing the unit makes bears extremely vulnerable, particularly to hunters using aircraft. More intensive management requires better information than is currently available. Because so little is known about Unit 18 populations, additional studies are recommended.

PREPARED BY:

Steven Machida
Game Biologist II

SUBMITTED BY:

David A. Anderson
Survey-Inventory Coordinator

Table 1. Reported Unit 18 hunter harvest and mean ages of bears taken, 1979-83.

Year	Season	Bears taken	Nonresident harvest (%)	No. of bears (mean age) Males	Females
1979	Spring	6	3 (60)	4 (8.4)	2 (3.9)
	Fall	6	5 (83)	4 (7.5)	2 (8.8)
1980	Spring	5	5 (100)	3 (15.1)	2 (7.9)
	Fall	9	8 (89)	4 (5.3)	5 (4.2)
1981	Spring	6	5 (83)	3 (12.0)	3 (7.7)
	Fall	18	16 (89)	12 (6.1)	6 (8.5)
1982	Spring	5	4 (80)	4 (11.4)	1 (24.8)
	Fall	9	9 (100)	3 (7.1)	6 (12.8)
1983	Spring	5	5 (100)	3 (7.1)	2 (11.9)
	Fall	11	7 (64)	8 (7.0)	3 (16.8)
Totals	Spring	27	22 (81)	17 (10.7)	10 (9.5)
	Fall	53	45 (85)	31 (6.2)	22 (9.9)

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 19

GEOGRAPHICAL LOCATION: Middle and Upper Kuskokwim River

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Based on discussions with hunters and guides and my observations, it appears that the grizzly bear population is relatively low in the mostly timbered Subunits 19A and 19D. They appear to be moderately abundant in Subunit 19C and increasing slightly in Subunit 19B.

Mortality

During 1983, 34 bears (19 males, 15 females) were taken in Unit 19, 8 in Subunit 19A, 4 in Subunit 19B, 20 in Subunit 19C, and 2 in Subunit 19D. The harvest is similar to the 23-year average of 33 bears but considerably below the post-1972 annual average of 49 bears. Nearly all of the reduced harvest level can be attributed to permit requirements for hunting grizzly bears in Subunit 19B which began in 1981. This permit requirement resulted in reported harvest levels which dropped from an annual average of 27 bears prior to permit requirements, to 3 bears since.

Twenty (10 males, 10 females) of the 34 bears were taken in Subunit 19C. Although this was similar to the previous 14-year average of 22 bears, the average age of bears taken in 1983 (6.4 for males, 5.8 for females) declined from the 14-year average of 7.0 for males and 7.1 for females. Nineteen of the 20 bears were taken by guided hunters, so apparently either guides are not attempting to take older bears for their clients or older bears were not available.

There was 1 applicant for 9 available permits for the spring hunt in Subunit 19B. The permittee from Anchorage did not hunt. There were 35 applicants (7 residents, 28 nonresidents) for the 16 permits available in the fall. Of these, 8 hunted and 4 took a bear in the fall.

Management Summary and Recommendations

The bear harvest in Unit 19 continued to be closely tied to the activities of guides, as 30 of the 34 bears were taken on guided hunts. The permit requirement in Subunit 19B has greatly curtailed bear hunting in that Subunit and the bear population appears to be rebounding from the earlier over-harvest.

Although harvest levels in Subunit 19C have remained fairly constant for the last 14 years, the size and age of bears taken in 1983 declined, even though nearly all bears were taken by guided hunters. Harvest statistics should be carefully monitored to determine if the 1983 harvest represents a population trend.

PREPARED BY:

Robert E. Pegau
Game Biologist III

SUBMITTED BY:

Jerry D. McGowan
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20

GEOGRAPHICAL DESCRIPTION: Central Tanana-Upper Yukon Valley

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Data regarding the population status of grizzly bears in Unit 20 are lacking, but casual observations and other indices suggest in most areas the population is moderate in size and stable.

Mortality

Bear sealing data indicate 61 bears were harvested in Unit 20 during 1983 (Table 1), including 4 bears shot in defense of life or property. The 22-year mean annual harvest is 35 bears. The harvest increased from 1982 levels in all subunits, except in Subunit 20A, where it was unchanged, and in Subunit 20E, where it declined by 1. Harvests increased during both the spring and fall seasons, suggesting at least part of the increase was due to hunters specifically seeking bears and not to an increased incidental take by moose or caribou hunters.

For the 2nd consecutive year, the Subunit 20A harvest was reduced from previous levels because of the shortened September season. The Subunit 20E harvest continues to be well above average, due primarily to promotional efforts by the department to increase bear harvests there and to incidental harvests during recently liberalized moose and caribou seasons.

The mean age of bears harvested in 1983 (7.2 years) declined by 3 years from the 1982 mean, but is identical to the average age of all bears killed since 1969. No significant age difference existed between the sexes of bears killed. Males comprised 63% of the harvest, about the same as in recent years.

Regardless of the decline in average age, the sex and age of bears harvested does not indicate excessive exploitation.

Management Summary and Recommendations

Attempts to increase the bear harvest in Subunit 20E appear to be successful; the harvest increased from 4 in 1980 to 19 in 1983. Thirteen bears were taken in the Mosquito Flats-upper Fortymile River area where the department has managed for reduced bear and wolf numbers to benefit depressed ungulate populations.

The Subunit 20A bear harvest continued at a moderate level, due primarily to a shortened September season which minimized the incidental fall grizzly harvest. Only 9 bears were taken in 1983, compared with 31 grizzlies harvested there in 1981. The reasons for the larger grizzly harvest in Subunit 20D are unclear, but probably relate to increased hunting opportunity for moose and caribou, therefore allowing an increased opportunistic take.

Brown bear management in much of Unit 20 may involve temporary reductions in bear numbers to enhance ungulate survival and population recovery. Management will require balancing bear and ungulate populations to attain management goals for both bears and ungulates.

PREPARED BY:

Larry B. Jennings
Game Biologist III

SUBMITTED BY:

Jerry D. McGowan
Survey-Inventory Coordinator

Table 1. Unit 20 grizzly bear harvest by subunit, 1983.

Subunit	Spring	Fall	Total
20A[a]	6	3	9
20B[a]	3	5	8
20C	3	11	14
20D	1	9	10
20E[a]	7	12	19
20F	0	1	1
Totals	20	41	61

[a] These figures include bears killed in defense of life or property as follows: Subunit 20A, 1; Subunit 20B, 2; Subunit 20E, 1.

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 21

GEOGRAPHICAL DESCRIPTION: Middle Yukon (Tanana to Paimiut)

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Field observations, nuisance reports, hunter sightings, and pilot observations indicate a grizzly population of moderate density which appears stable.

Mortality

Hunting pressure on bears in Unit 21 continues to be low. Five bears were harvested during spring, 1 was taken in fall, and 1 was taken in defense of life or property. Of the 6 bears killed by hunters, half were taken by nonresidents. Six of the bears came from the Anvik-Nulato Hills in Subunits 21D and 21E. The unreported kill of bears taken in defense of life or property was estimated at 12 bears, all probably taken along the Yukon River.

Management Summary and Recommendations

Since 1961, annual harvests have had an insignificant impact on the bears in Unit 21. A much greater harvest could be sustained, but present interest in grizzly bear hunting is low. Nuisance bears continue to bother fish camps, smokehouses, and trapping camps, and a more liberal season is recommended along the Yukon and Koyukuk Rivers where the majority of problems with bears occur.

PREPARED BY:

Timothy O. Osborne
Game Biologist III

SUBMITTED BY:

Jerry D. McGowan
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 22

GEOGRAPHICAL DESCRIPTION: Seward Peninsula

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulation No. 23 and 24.

Population Status and Trend

Heavy hunting pressure by miners and reindeer herders during the early 1900's probably kept grizzly bear numbers on the Seward Peninsula very low. The population increased during the next 50 years and is thought to have reached densities near carrying capacity 15-25 years ago. Liberalized seasons established in 1979 coupled with a relatively high bear population prompted a number of guides to move into the unit. As a result, the 1979 harvest more than tripled over that of the previous year, with nonresidents taking 76% of the harvest (Table 1). The Board of Game implemented a permit system for nonresidents beginning in fall 1980. Concurrently, the Guide Board allocated restricted guiding areas within those portions of Unit 22 not already assigned to individual guides. Those actions were responsible for a decline in the nonresident harvest during the next 3 years.

Although data are not available, the Unit 22 grizzly bear population still appears to be increasing slightly. Bear sightings and reports of bears raiding fish camps were common during the summer of 1983. Although more bears are killed each year than reported, the annual harvest is still believed to fall within acceptable limits (30-40 bears) as determined by Grauvogel (1982).

Population Composition

Reliable data on the composition of the Seward Peninsula bear population are nonexistent. Because of this, I again relied on Grauvogel's (1982) estimates. At that time, he calculated the Unit 22 grizzly bear population to be 373-643 bears. These values were derived by assuming densities of 1 bear/35 mi^2 and 1 bear/64 mi^2.

The mean age of the 32 bears harvested within the unit in 1983 was 6.3 years; this is 1.8 years less than last year's mean and approximately 1 year less than the mean of the past 22

years. The oldest animal harvested was a female estimated to be 20 years of age, and the youngest animal taken (also a female) was estimated to be 1.8 years of age. The mean age of all males harvested was 5.1 years, and the mean age of all females harvested was 7.6 years. Because the harvest sample from the unit is rather small ($\underline{N}$ = 25), these data should only be used to determine long-term trends rather than to compare ages over a shorter time span.

Mortality

Twenty-eight bears were legally harvested on the Seward Peninsula during 1983. Of these, 7 (25%) were taken during the spring hunt, while 21 (75%) were harvested during the fall hunt (Table 1). The Unit 22 harvest comprised 3% of the statewide harvest, up slightly from last year. Alaskan residents harvested 20 (71%) of the legally taken bears. Of these 15 (75%) were taken by residents of Nome, 2 (10%) were taken by other residents of Unit 22, and 3 (15%) were taken by other Alaskan residents. Nonresidents took 8 bears and accounted for 29% of this year's reported harvest. Four bears were known to be taken in defense of life and property, bringing the total known harvest to 32 bears. Fifteen of these were males, 14 were females, and 3 were of unknown sex (Table 2). Each year some bears are either illegally taken or wounded and left to die; these instances are normally not recorded. I therefore estimate that 35-40 bears were removed from the Unit 22 population during the reporting period.

The 1983 harvest of grizzly bears came from drainages throughout all 5 subunits of Unit 22; however, most of the take came from Subunits 22A and 22B (Table 2). Most bears harvested by residents have traditionally been taken in Subunit 22C during the spring hunt by recreational hunters from Nome. However, poor snow conditions and a reduction in the number of bears within Subunit 22C changed the distribution of the 1983 harvest. Although the bears were still taken for recreational purposes and the hunters were still from Nome, most bears taken by residents were harvested during the fall hunt in Subunit 22B.

Management Summary and Recommendations

The grizzly bear population in Unit 22 has increased slowly during the last several decades. Bears now occupy most suitable habitat on the Seward Peninsula, and densities are near carrying capacity in some areas. Although a sharp increase in harvest during the 1979 and 1980 hunting seasons probably reduced bear numbers in some drainages, the establishment of restricted guiding areas and the nonresident permit system greatly reduced the nonresident harvest.

I estimate that 35-40 bears were harvested from the Seward Peninsula population during the reporting period. Based on Grauvogel's (1982) population estimates, the 1983 harvest probably did not exceed sustained yield.

Reindeer herders strongly advocate a reduction of Unit 22 bear numbers, because they believe bears prey heavily on reindeer calves; other area residents have a similar opinion concerning moose calves. Recent Game Board deliberations over elimination of the resident tag fee have also identified a need for better biological information. A research study needs to be initiated to determine bear population characteristics within the unit. It is currently impossible to make sound management decisions and recommendations without this information. A more active enforcement program is also needed to increase the reliability of harvest estimates.

Literature Cited

Grauvogel, C. A. 1982. Unit 22 brown/grizzly bear survey-inventory progress report. Pages 82-88 in R. A. Hinman, ed. Annual report of survey-inventory activities. Part I. Black Bears and Brown Bears. Vol. XIII. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-19-2 and W-22-1. Job 17.0 and 4.0. Juneau. 93pp.

PREPARED BY:

Robert R. Nelson
Game Biologist II

SUBMITTED BY:

David A. Anderson
Survey-Inventory Coordinator

Table 1. Unit 22 grizzly bear harvest by residency status, 1976-1983.

Year	Resident kill			Nonresident kill			Total kill			% Nonresident harvest
	Spring	Fall	Total	Spring	Fall	Total	Spring	Fall	Total	
1976	4	5	9	1	1	2	5	6	11	18
1977	5	2	7	2	3	5	7	5	12	42
1978	4	2	6	4	4	8	8	6	14	57
1979	7	5	12	33	5	38	40	10	50	76
1980	10	2	12	15	4	19	25	6	31	61
1981	15	6	21	1	6	7	21	12	33	21
1982[a]	10	2	12	0	3	3	10	5	15	20
1983[b]	6	14	20	1	7	8	7	21	28	29

[a] Values do not include 7 bears taken illegally.

[b] Values do not include 4 bears reportedly taken in defense of life and property.

Table 2. Unit 22 grizzly bear harvest by subunit and sex, 1983.

Subunit	Males	Females	Unknown	Total
22A	5	6	0	11
22B	7	3	2	12
22C	1	3	0	4
22D	2	2	0	4
22E	0	0	1	1
Totals	15	14	3	32

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 23

GEOGRAPHICAL DESCRIPTION: Kotzebue Sound

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Knowledgeable local residents believe that the Unit 23 grizzly bear population has increased substantially during the past 20 years. However, because of liberalization of hunting regulations in recent years and an increased harvest by nonresident guided hunters since 1977, the population may no longer be increasing.

Residents of Kivalina reported substantial bear depredation of char caches along the Wulik River during fall 1982 and wanted a larger local harvest of bears. Noatak residents also reported that bears were numerous and causing problems; e.g., digging in the village cemetery.

In April 1983, bear surveys were conducted during spring emergence to gather more information on bears in problem areas, to evaluate the feasibility of determining minimum population density estimates rather than relying solely on values determined for the North Slope, and to identify important bear denning habitat near the proposed Red Dog Mine transportation corridor. The survey area (2,970 mi^2) consisted of the hilly terrain between the Wulik and Noatak Rivers, portions of the De Long Mountains near the Red Dog Mine site, portions of the Agashashok and Squirrel River drainages, and Hotham Inlet drainages northeast of Kotzebue.

Surveys were flown on 20, 21, and 26 April following the 1st spring thaw. Although some solitary bears had typically emerged from hibernation in late March and early April, most bears did not emerge until just prior to or during the surveys. No sows with cubs of the year (normally the last to emerge) were observed during the survey; therefore, bear densities were underestimated.

Twenty-seven bears were observed, including 5 sows with 2 yearling cubs each, 1 sow with a 2-year-old cub, and 10

solitary bears. In addition, the tracks of 4 sows accompanied by cubs and the tracks of 8 solitary bears were seen in locations too far from observed bears to have been made by them. Two of these sow/cub groups had returned to their dens and so were not observed from the aircraft. The total count based on tracks and sightings was 47 bears, or 1 bear/63 mi^2. Because no sows with cubs of the year were observed and other solitary bears were probably still in dens, I estimate that at least 75 bears were in the survey area (at least 1 bear/40 mi^2).

Mortality

Thirty-nine bears were sealed in 1983, compared to 30 in 1982, and 21 in 1981. Additionally, 3 bears (1 sow and 2 cubs-of-the-year) were killed illegally near Shungnak during fall, the hide of a yearling grizzly was found at the Kotzebue dump, and 2 bears were reported taken by residents of Kivalina during spring but were not sealed, bringing the known kill to 45 bears. Other bears were probably killed by unit residents and not reported or sealed.

Nonresident guided hunters took 9 bears (23% of the reported harvest), 4 during the spring season and 5 in fall. An earlier spring season (effective 1982) has generated some additional nonresident participation.

The 29 males taken comprised 74% of the 1983 harvest, a value comparable to the 1961-83 mean of 76%. Mean age of harvested males was 6.5 years, the youngest harvest since 1972 when aging began. Mean age of harvested females was 5.3 years, well below the 15-year mean of 7.5 years. Five of the 9 females were of breeding age; i.e., older than 5 years.

Management Summary and Recommendations

In 1983 both the spring and fall nonresident permit hunts were undersubscribed (15 applicants for 25 permits). Currently, guides must book bear hunters several months in advance to meet permit application deadlines. Potential clients who decide to hunt at a later date or, characteristically, at the last minute cannot obtain permits. Issuing the remaining permits on a firstcome, first-serve basis would alleviate the problem.

The Unit 23 grizzly population has previously been estimated at 1,000 bears, assuming a density of 1 bear/50 mi^2. Surveys conducted in 1983 indicate that the density may be higher in some areas; therefore, the unitwide population may exceed 1,200 bears. For the past 2 years the annual kill has undoubtedly exceeded 50 bears including unreported take, for a harvest rate of approximately 4-5% annually. Although this

rate probably does not exceed sustained yield, it would not be desirable to increase the harvest at this time. The decline in mean age of males indicates that there are few old males left in the population and that hunting has altered population age structure. However, no change in the season is recommended.

Conducting bear surveys following the peak period of emergence has potential for determining minimum densities and for estimating actual densities. Continuous snow cover and a rapid increase in temperature (to freezing or above) are optimal survey conditions. Even if survey conditions are not ideal, other information useful for management can be obtained at relatively low cost.

PREPARED BY:

Roland L. Quimby
Game Biologist III

SUBMITTED BY:

David A. Anderson
Survey-Inventory Coordinator

BROWN/GRIZZLY BEAR

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 24, 25, and 26

GEOGRAPHICAL DESCRIPTION: Brooks Range Drainages

PERIOD COVERED: 1 January 1983-31 December 1983

Season and Bag Limit

See Hunting Regulations No. 23 and 24.

Population Status and Trend

Research showed that the Brooks Range grizzly bear density ranges from 1 bear/17-300 mi^2, with an average density of about 1 bear/100 mi^2. Based on probable densities and food availability within various areas, the Brooks Range is presently estimated to have a minimum population of 2,200-2,700 grizzlies.

Due to the reduced harvest brought about by permit requirements, grizzly populations in Subunit 26B are likely beginning to recover from previous overharvest. Population trends in Unit 24 and eastern Subunit 26A are probably stabilized or growing; in Unit 25, western Subunit 26A, and Subunit 26C numbers are probably increasing.

Population Composition

Recent population composition data are available only for the western Brooks Range near the headwaters of the Utukok and Kokolik Rivers. In that area, approximately 40% of the bears >1 year old were males and 60% were females. The sex ratio of cubs and yearlings was probably equal but may slightly favor females.

Percentages of bears by age classes were as follows: cubs, 13.0%; yearlings, 10.7%; 2-year-olds, 13.7%; 3 and 4-year-olds, 10.7%, and over 5 years of age, 51.9%.

Quantified parameters of grizzly bear reproductive capacity for the eastern Brooks Range (1973-75 data) and western Brooks Range (1977-83 data) are as follows (listed as eastern and western Brooks Range, respectively): mean age at production of 1st litter of 10.1 and 8.0 years; mean litter sizes of 1.8 and 2.0 cubs; reproductive intervals of 4.2 and 4.0 years; and mean reproductive rates of 0.42 and 0.50 cubs/year. In

addition, preliminary research results for the population on the coastal plain of Subunit 26C indicate that numbers and reproductive capacity in that area is high, similar to the western Brooks Range population.

Mortality

The permit system in the Brooks Range has continued to effectively prevent overharvest. During 1983, 49 grizzlies were taken in Unit 26 and the portions of Units 24 and 25 where permits were required (including 3 taken in defense of life or property; Table 1). A large portion of the Gates of the Arctic National Park is within the Unit 24 permit hunting area; hunting by local residents for subsistence purposes was allowed but no bears were reported killed. Sport hunting is not allowed within the Park and hunting pressure in the remainder of the unit was low.

Management Summary and Recommendations

Grizzly bear harvest in the Brooks Range was lower than, or within levels appropriate for, the populations in the various units. In Unit 25, the take has increased due to additional guides establishing exclusive guiding areas in the unit, but the harvest was not excessive. The western portion of Subunit 26A has received only light hunting pressure but has a relatively high bear population. A greater harvest could be sustained in this area, especially during spring seasons where females are not vulnerable to sport hunting. Similarly, preliminary research data from northern Subunit 26C indicate a greater harvest may be safely taken there. Harvest in areas outside the permit areas in Units 24 and 25 were within sustainable levels.

PREPARED BY:

Harry V. Reynolds
Game Biologist III

SUBMITTED BY:

Jerry D. McGowan
Survey-Inventory Coordinator

Table 1. Sport hunting harvest of grizzly bears in Units 24, 25, and 26, 1977-1983.

GMU	Estimated population	Harvest of 4%	7-year mean	Harvest						
				1977	1978	1979	1980	1981	1982	1983
			Permit areas							
24	165-220	7-9	7[a]	10	12	2	9	7	1	7[b]
25A	360-470	14-19	10[a]	13	4	10	5	9	15	16
26A west	315-350	13-14	4	2	2	1	8	6	2	4[b]
26A east	330-430	13-17	7	7	5	5	5	5	11	11
26B	150-240	6-10	6	8	3	5	8	2	4	9[b]
26C	220-320	9-13	2	3	4	1	1	1	4	2
Totals	1540-2030	62-82	36	43	30	24	36	30	37	49
			Nonpermit areas							
24	[c]	[c]	5	1	8	5	4	5	3[b]	6
25	[c]	[c]	9	11	10	14	8	1	4	7
Totals			14	12	18	19	12	6	7	13

[a] These figures include reported harvest only; additional illegal harvest very likely took place within permit areas and was reported as outside permit areas.

[b] Includes 1 killed in defense of life or property.

[c] Not calculated.