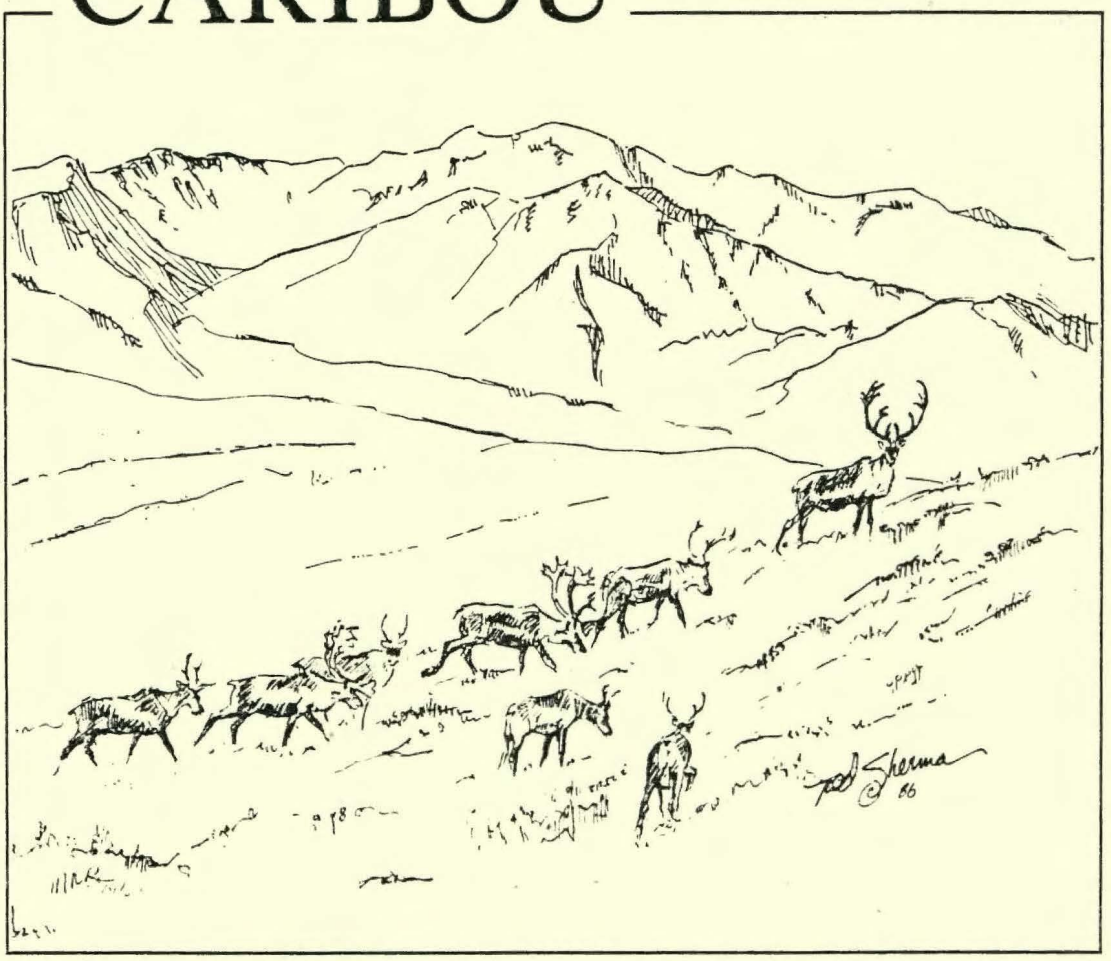
Alaska Department of Fish and Game
Division of Game
Federal Aid in Wildlife Restoration
Annual Report of Survey—Inventory Activities

CARIBOU



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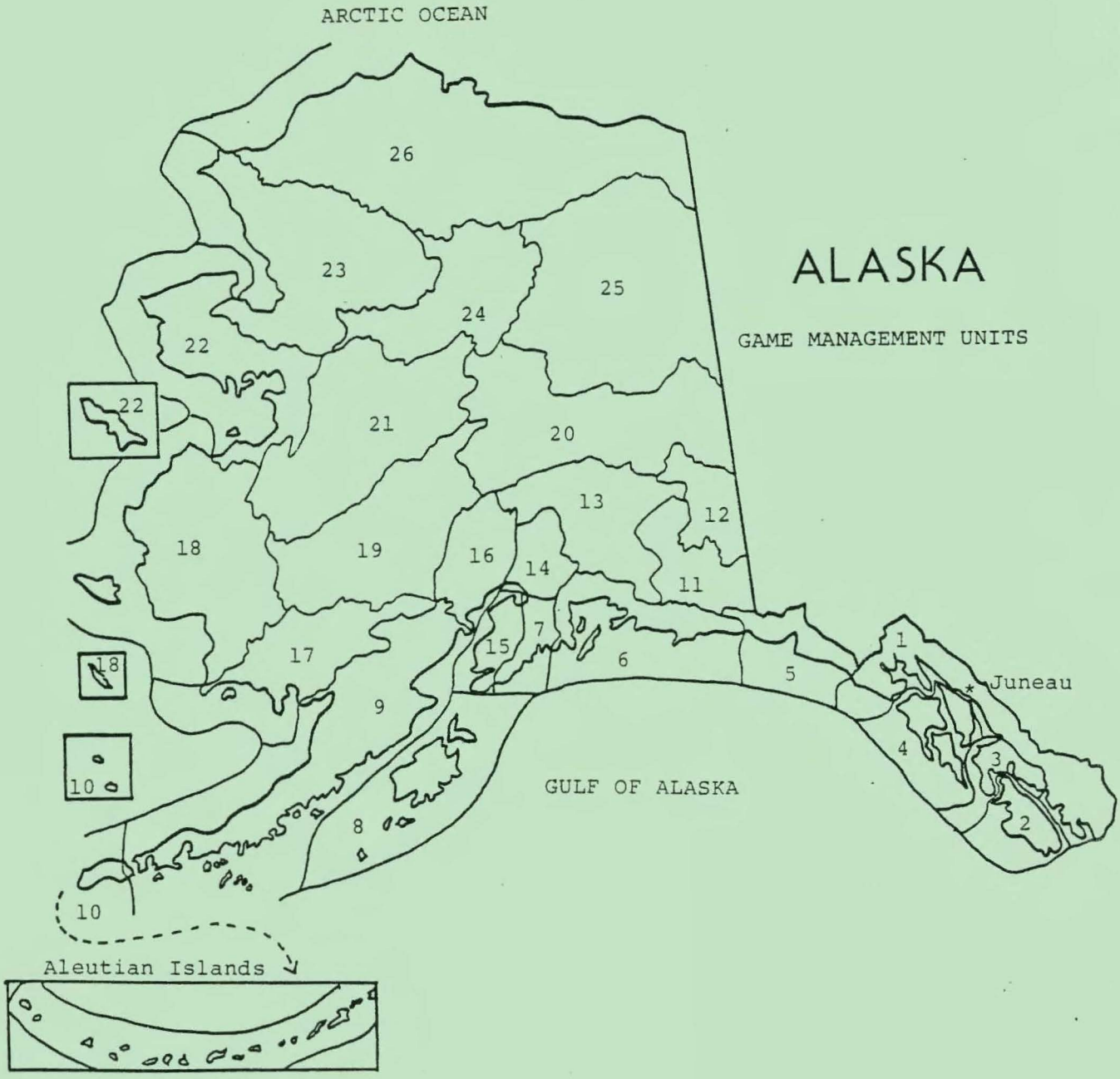
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STATEWIDE HARVEST AND POPULATION STATUS

Twenty-four groups of caribou are identified in Alaska as "herds," but the size of these groups varies from a few hundred to nearly a quarter of a million animals. Caribou numbers in the major herds (Mulchatna, Nelchina, Porcupine, Western Arctic) are presently at high numbers and are either increasing or stable. Most intermediate-sized herds (e.g., Northern Alaska Peninsula, Delta-Yanert, Fortymile, Central Arctic) are stable or increasing. Status of the smaller herds varies; some of the remnant herds in Units 19 and 21 appear to be declining. Statewide, caribou populations are relatively high and increasing, a decidely more optimistic outlook than existed a decade ago.

Hunter harvests of caribou in 1985-86 were generally as high or higher than during the past year. However, reported harvest (derived largely from hunter report cards) is still far below the actual harvest; compliance with reporting requirements is still a significant problem, particularly in rural areas. Herd status and reported harvest in 1985-86 are summarized on the following page.

Robert A. Hinman
Deputy Director

Herd	GMU	Population estimates	Population trend	Reported harvest	Estimated harvest
Kenai Mtns.	7	400	Stable to increasing	33	--
Mulchatna	9A, 9B, 16, 17, 19	42,900	Increasing	962	1,700-2,100
N. AK Peninsula	9C, 9E	15,274	Stable to decreasing	751	1,400
S. AK Peninsula	9D & Unimak	?	?	345	--
Adak	10	420-500	Stable to increasing	149	--
Mentasta	11	3,140	Increasing	97	--
Nelchina	13, 14B	27,528	Increasing	995	--
Kenai Lowlands	15A & B	85	Stable	0	--
Chisana	12	1,100	Stable to increasing	65	--
Denali	13E, 20C	2,000-2,500	Stable?	0	--
Beaver Mtns.	19, 21	?	Decline	3	10-15
Kuskokwim Mtns.	19, 21	?	?	2	10
Sunshine Mtn.	19	?	Decline	0	--
Big River	19	?	Decline	18	35-40
Rainy Pass	19	?	?	39	50-60
Tonzona	19	?	?	5	10-15
Delta/Yanert	20A	8,300	Slow increase	396	--
Macomb	20D	700	Increasing?	12	--
Fortymile	20E	14,000	Slow increase	261	400
Porcupine	25, 26C	160,000-170,000	Stable	64	500-700[a]
Central Arctic	26B	13,000+	Increasing	662	1,000
Kilbuck	18	60-70	Slow increase	0	10-12
Andreafsky	18, 22A	200	?	?	--
Western Arctic	21D, 22A & B, 23, 24, 26A	173,000-241,000	Increasing	4,018	16,000
Statewide totals		462,107-540,697		8,877	23,217-23,844

[a] Estimated harvest 4,000 in Canada.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 7

HERD: Kenai Peninsula Mountains

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

In 1965 and 1966, the Alaska Department of Fish and Game transplanted caribou from the Nelchina Herd to the northern portion of the Kenai Peninsula. The transplanted caribou eventually formed into 2 herds. The larger herd established residence in the Kenai Mountains south of Hope and became known as the Kenai Peninsula Mountain Herd. Annual composition surveys conducted since 1977 indicate that this herd has steadily increased in size and currently numbers over 400 animals.

Population Composition

On 29 October, a composition survey was conducted using a Bell 206B Jet Ranger helicopter. Four hundred and one caribou were observed and classified into 3 categories: calves (males and females), females (yearling to adult), and males (yearling to adult). Results of the survey were: 59 calves, 238 females, and 104 males. Ratios calculated using these results indicate a herd composition of 25 calves:100 females, and 44 males:100 females, with calves making up 15% of the 401 caribou classified.

Mortality

Hunting for caribou in Unit 7 during 1985 was restricted to Alaska residents who qualified under the current subsistence criteria. Criteria used to determine participants in this hunt were based on 3 statutory requirements: (1) customary and direct dependence on the resource as a mainstay of one's livelihood; (2) local residency; and (3) availability of alternative resources.

One hundred thirty-four (67%) of the 200 subsistence permit holders reported hunting and 33 caribou were harvested. Hunter success was 25% compared with 46% (52/114) the previous year during a nonsubsistence drawing permit hunt with the same number of permits issued. The harvest was composed of 21 (64%) males and 12 (36%) females.

Management Summary and Recommendations

The management objective for the Kenai Mountains Caribou Herd is to allow the herd to increase to approximately 300 animals, and then to stabilize the herd's size through increased hunting. Prior to 1986, winter reconnaissance surveys indicated that during winter this herd used only a small portion of its total range, and caribou were generally confined to snowfree ridge tops on the east side of Big Indian Creek. These open ridges are not only subjected to heavy grazing, but also, the spading action of caribou hooves has increased wind erosion, further reducing the area's carrying capacity. However, results of a survey conducted on 28 April indicate that caribou spent at least 2 months before the survey on the west side of Big Indian Creek. This westward movement significantly increased the size of their winter range. If caribou continue to use this expanded winter range, the post-hunting season management objective for herd size should be increased to 400 animals.

Findings from a post-season survey (401), plus the reported harvest (33), indicate the minimum 1985 pre-season caribou population size was about 434. Although the population was reduced, by hunting, to a minimum of 401 animals, an assumed minimum population growth of 10% would exceed the revised management objective (400) for fall 1986 by approximately 40 animals. Two hundred fifty permits would be necessary to achieve the desired harvest level of 40-60 animals, to stabilize the population. Additionally, the 1986 season should be lengthened and the dates returned to 10 August-31 October for 1986. No change in bag limit is recommended.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9A, 9B, 16, 17, and 19

HERD: Mulchatna

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Mulchatna Herd continued to expand its range to the northwest during this reporting period. Large numbers of caribou were observed by Lake Clark National Park personnel in the Sparrevohn area and along the headwaters of the Stony River. Seventy-two caribou were sighted on Kemuk Mountain west of the Nushagak River in June and a minimum of 100 caribou were observed in the upper Kiseralik River drainage during the same month (S. Patten, pers. commun.).

A photocensus conducted on 12 July indicated a minimum population size of 42,900 caribou in the Mulchatna Herd. Population growth of this herd has been rapid since 1981, when radio transmitters were first used to assist in locating post-calving aggregations. Herd growth may have been stimulated in recent years by suspected generally low levels of predation and low hunting mortality. Except for 1984-85, winters in the northern Bristol Bay area have been very mild and overwinter survival of all age classes has been excellent.

Calving took place primarily in the Twin Lakes-Turquoise Lake area, although 2 calves were first observed on 6 May, 10 miles east of Ekwok along the lower Nushagak River. Radiotelemetry data indicate that caribou from the upper Koktuli River (animals that apparently have calved in the area since 1981) may have calved with the major portion of the herd in the Twin Lakes area this year.

Mortality

Hunters reported taking 962 Mulchatna caribou during the 1985-86 season. The reported take, listed by Game Management Unit, is included in Table 1.

Harvest report reminder letters were mailed to all nonreporting hunters having zip codes in Unit 17, Subunit 9B, and Lime Village in Subunit 19A. Of the 504 letters mailed on 1 May, 260 were returned. While reminder letters significantly improved reporting of harvest by unit residents, a significant number of local hunters still do not report and many do not use harvest tickets. Additionally, many unit resident hunters take more caribou than they report. The total estimated harvest during this reporting period is 1,700-2,100 caribou.

Management Summary and Recommendations

The Mulchatna Caribou Herd has experienced exceptionally rapid growth since 1980. The post-calving population estimates have increased from 20,618 in 1981 to 42,900 in 1985. During this period, season dates and bag limits have become increasingly liberal, and hunting pressure has grown at a rate exceeding that of herd growth. Harvest rates, however, have not exceeded 10% per year, and coupled with low mortality rates from other causes, have allowed this herd to increase at a rate approaching 20% per year.

Cooperative efforts with Lake Clark National Park personnel, to monitor herd movements and range use and to estimate population size, continued through this reporting period. Eleven caribou were radio-collared during April 1986 to replace collars lost due to battery failure.

Since 1981, the Mulchatna Herd has temporarily occupied habitat west of the Nushagak River. However, due to hunting pressure during fall and winter seasons, the herd has not established long-term use of this area. Virtually all of the hunting pressure comes from Nushagak River villages during the season. Representatives from these villages proposed a total season closure for caribou west of the Nushagak River at the December 1985 meeting of the Nushagak Advisory Committee. A closure of this season would be necessary for the Mulchatna Herd to expand its range into this area on a more permanent basis.

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Table 1. Mulchatna Caribou Herd reported harvest, by Game Management Unit, 1985-86.

Unit	Males	Females	Unknown sex	Total
9	180	46	3	229
16	1	1	1	3
17	413	113	6	532
18	0	1	0	1
19	169	28	0	197
Totals	763	189	10	962

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9C and 9E

HERD: Northern Alaska Peninsula

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

A photocensus of the Northern Peninsula Caribou Herd was conducted on 30 June 1986, and a minimum of 15,274 animals were counted. The calving area was surveyed in the same manner as during the past 3 years. Since 3 radio-collared caribou were not located during the survey period, there is the possibility that 1 or more aggregations were missed. A 2nd survey, attempted on 10 July 1986, was unsuccessful due to fog.

Population Composition

During the June census, sex and age composition data were obtained by sampling major segments of the herd. The samples totaled 2,451 caribou and contained an overall average of 28% calves. This percentage is similar to calving rates observed over the past 7 years. A fall composition survey was not conducted this year.

Mortality

The reported harvest was 751 animals, including 612 males (82%), 133 females (18%), and 6 of unspecified sex. As in past years, local residents killed substantial numbers of caribou but few were reported. The total harvest was estimated at approximately 1,400 caribou.

The bag limit in the August portion of the 1985 season was reduced to 2 caribou and resulted in a reported harvest of 93 caribou. This figure contrasts with 167 caribou killed during August 1984 when the limit was 4 animals. During August 1985, 30% of the successful hunters took 2 caribou. A 1-caribou bag limit is in effect from 1 September to 31 October, while a

4-caribou limit occurs from 1 November to 31 May. For the 1985-86 season, 84%, 9%, 4%, and 4% of successful hunters reported killing 1, 2, 3, and 4 caribou, respectively.

Management Summary and Recommendations

The gradual growth of the Northern Alaska Peninsula Herd may have ceased. This year's census suggests that the herd may even have declined in numbers. Close monitoring during the next few years is needed to ensure that intensive harvesting does not reduce the herd below the desired minimum size of 15,000 animals, post-calving. No further liberalization of hunting regulations is justified at this time.

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Survey-Inventory Coordinator

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9D and Unimak Island

HERD: Southern Alaska Peninsula

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The current population status and trend of the Southern Alaska Peninsula Herd is unknown. In April 1986, U. S. Fish and Wildlife Service personnel fitted 10 caribou with radio collars to aid in locating herds for a photocensus. On 16 July 1986, a census was attempted, but due to telemetry problems only 1 large aggregation of approximately 3,000 caribou was located. The last complete photocensus was accomplished in 1983, when 10,200 caribou were counted.

Population Composition

From 24 through 31 October 1985, the Izembek National Wildlife Refuge staff classified 1,460 caribou near Cold Bay. Calves made up 9.4% and adult bulls made up 11.9% of the sample. During the 16 July 1986 survey, 2,594 caribou were counted, including 17.2% calves and 4.1% adult bulls.

Mortality

During the 1985-86 season, 345 caribou, including 180 males and 162 females, were reported killed in Subunit 9D. This figure is similar to the average for the 5 previous years. Hunters took 86% of the harvest after 31 October, when the bag limit increased to 4 and the caribou were available along the Cold Bay road system. Of the successful hunters, 40%, 20%, 15%, and 22% took 1, 2, 3, and 4 caribou, respectively. The average bag per successful hunter was 2.3 caribou.

Management Summary and Recommendations

The lack of good population estimates since 1983, as well as consistently poor calf recruitment and the relatively low number of bulls seen near Cold Bay, have raised concern about

the recent status of this herd. U. S. Fish and Wildlife Service staff in Cold Bay have increased their efforts to monitor this herd, including radio-collaring 10 caribou in April. Due to defective transmitters, these collared animals have not aided survey efforts. It is recommended that a cooperative fall composition survey be completed in October 1986. A reliable census is needed and may require fitting additional caribou with functional transmitters.

During the 1987 post-calving survey, attempts should be made to identify females with distended udders to assess neonatal mortality rates.

Harvests have remained stable, but the 1985-86 harvest had a much higher percentage of females than previously reported for this herd.[1] Pending collection of more reliable population size and composition data, it may be necessary to adjust the hunting regulations.

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[1] We began analyzing data specifically for this herd in 1977, vs. the entire Alaska Peninsula caribou population prior to 1977.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 10

HERD: Adak Island

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Three hundred thirteen caribou were counted during a survey conducted on 22 August by U. S. Fish and Wildlife Service personnel stationed on Adak. Although the survey was conducted in a Piper PA-31 (twin engine, low-wing aircraft) flying at 120 knots, it is believed the count figure is accurate. Due to several factors (sightability, turbulence, the type of survey aircraft), it was also estimated that, at best, 75% of the herd was counted. Therefore, the post-calving population estimate was 420-500 animals.

Mortality

Three hundred eighty-eight permits were issued for this registration hunt. The reported harvest was 149 caribou, including 74 males and 75 females. This kill was the largest reported harvest since caribou hunting began on the island in 1964.

Management Summary and Recommendations

The post-calving count was comparable to data obtained in 1981 and 1984. Due to the type aircraft used in the survey, composition data were not available. Hunters removed 30% to 35% of the estimated population. This high harvest, of which 50% were females, should keep herd numbers within management guidelines.

Management of the Adak Caribou Herd depends on continued cooperation between the U. S. Navy, U. S. Fish and Wildlife Service, and the Department of Fish and Game, to ensure caribou numbers do not increase beyond a controllable level.

No changes in seasons or bag limits are recommended.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11

HERD: Mentasta

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The fall population estimate of the Mentasta Caribou Herd was 3,140 animals. This figure represents a moderate increase over the 1983 and 1984 estimates of 2,766 and 2,700 caribou, respectively.

Population Composition

A calf:cow ratio of 46:100 and a bull:cow ratio of 41:100 were obtained from data collected during fall composition counts conducted on 12 October. The calf:cow ratio increased appreciably over both the 1984 figure of 29:100 and the 4-year (1981-84) average of 34:100, suggesting increased production and/or survival of calves in 1985. The bull:cow ratio increased slightly from last year's figure of 36:100, but was similar to the 4-year (1981-84) average of 40:100.

Mortality

In 1985, hunters killed 67 caribou, including 51 bulls and 16 cows, in Unit 11. This reported harvest was down substantially from the 5-year (1980-84) harvest average of 126 caribou. The hunter success rate was 57%, similar to the previous year's figure of 58%.

The most popular transportation method used by successful hunters was aircraft (68%), followed by highway vehicles (22%), and off-road vehicles (8%).

In addition to the harvest in Unit 11, 30 Mentasta caribou were killed in Unit 12 by hunters in the Nabesna area.

Management Summary and Recommendations

The Mentasta caribou permit hunt was designated as a Tier II subsistence hunt by the Board of Game during their 1985 spring

meeting. Under a Tier II hunt designation, only Alaska residents could apply for permits. Permit applications were rated according to a formula, established by the Board of Game, favoring local residents who are dependent on game as a major portion of their diet and who have few alternative resources available. Although 350 permits were available for the Mentasta hunt, only 170 individuals applied and every applicant was issued a permit.

The 10 September opening date for the 1985 season was a month later than the previous opening date of 10 August. The Board of Game meeting that established Tier II hunts was not held until June. This fact, together with the time needed for printing, distributing and collecting applications, and issuing permits, resulted in a 30-day delay in season opening. The overall decline in the number of caribou harvested during 1985 was due to the combined effects of a 30-days-shorter season and fewer permits being issued.

The Mentasta herd increased slightly during the past year because of an increase in calf recruitment. However, the overwinter survival rate for this calf cohort is unknown. Previous data suggest the Mentasta herd is fairly static and until a definite trend of increased calf recruitment occurs, herd size is not expected to show a yearly increase.

The season dates should be returned to 10 August through 30 September.

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Survey-Inventory Coordinator

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 12

HERD: Chisana

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

No surveys of the Chisana Herd were conducted during this reporting period. Residents of Chisana believe the herd is growing slowly. The Chisana Herd, which occupies approximately 900-1,000 mi^2 of range in Alaska, is estimated to contain at least 1,100 caribou. Suitable, contiguous range which could support a larger herd exists in the Yukon Territory.

Currently, the management objective of providing the greatest opportunity to participate in hunting caribou is not being met in Unit 12. A short, 20-day September season is necessary to prevent overharvest of Chisana caribou (and Mentasta Herd caribou while in Unit 12).

Mortality

Predation by wolves, grizzly bears, coyotes, and golden eagles is believed to be the primary mortality factor affecting the Chisana Herd and that portion of the Mentasta Herd inhabiting Unit 12.

Hunters reported taking 65 bull caribou from the Chisana Herd during September 1985, compared with 31 in 1984, 28 in 1983, and 21 in 1982. Thus, harvests are increasing. Ninety hunters reported hunting Chisana caribou, for a success rate of 72%.

Thirty-one bulls were reported taken elsewhere in Unit 12 during 1985, 30 from the Mentasta Herd in the vicinity of the Nabesna Road, and 1 from the Nelchina Herd at Gillette Pass. One hundred thirteen hunters reported hunting caribou outside the range of the Chisana Herd, for a hunting success rate of 27%. In 1984, 27 bulls were reported taken from the Mentasta

Herd in Unit 12 and 1 was taken from the Nelchina Herd. Therefore, it appears that harvests from herds in Unit 12 remained roughly stable in 1985.

Management Summary and Recommendations

The total reported harvest of 96 bull caribou in Unit 12 represents a significant increase (63%) over the 1984 reported harvest of 59 bulls. Nearly all of the increase was directed toward Chisana caribou. If the herd is increasing, as reported by Chisana residents, the increased harvest may simply reflect greater availability of caribou. A fall survey is recommended to allow comparison of the present bull:cow ratio with ratios from previous surveys.

No change in season or bag limit is recommended until a fall composition survey is conducted.

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Jerry D. McGowan
Survey-Inventory Coordinator

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 13 and 14B

HERD: Nelchina

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The estimated fall population of the Nelchina Caribou Herd was 27,528. This figure represents a substantial increase over last year's estimate of 24,095 but is consistent with the approximately 8% average annual rate of increase seen over the period 1980-85.

Population Composition

A post-calving survey conducted on 8 July resulted in an observed calf:cow ratio of 55:100. A fall composition survey conducted on 11 October yielded a calf:cow ratio of 46:100 and a bull:cow ratio of 54:100. Average ratios for this herd for the preceding 5 years (1980-84) are similar: summer calf:cow ratio, 52:100; fall calf:cow ratio, 40:100; and fall bull:cow ratio, 56:100. This year, no spring count was conducted to determine overwinter survival of calves.

Mortality

As a result of action by the Board of Game, hunting of the Nelchina Caribou Herd was permitted only under Tier II subsistence regulations in 1985-86. Unlike prior years when there were 2 hunts, one for local residents and one for Alaskan residents in general, under this year's Tier II designation there was only 1 hunt, for which any Alaskan resident could apply. Permit applications were rated according to a formula that favored local residents who were dependent on game for a major portion of their diet and who had few alternative resources available to them. Permits were issued to those with the highest scores. Two thousand, eight hundred thirteen applications were submitted for the 1,800 permits.

Nine hundred ninety-five caribou, including 815 males, 174 females, and 6 of unknown sex, were reported killed by 1,521 permittees who reported hunting this year. Hunter success was 65%. Four hundred seventy-five caribou were taken during the 10-day fall season and 520 were taken during the 2-month winter season.

The most popular method of transportation used by successful hunters was highway vehicles (42%), followed by snowmachines (17%), off-road vehicles (11%), aircraft (11%), boats (10%), three- or four-wheelers (9%), and horses (1%). This pattern represents a change from transportation methods used in the few preceding years when off-road vehicles were the most common method (30-40%), followed by aircraft and highway vehicles (both 20-25%). This year's variation is the result of a combined 10-day fall and 60-day winter season for all 1,800 permittees. From 1981-84, most permittees hunted before snowfall during a 32-day fall season; only 150-300 local residents hunted during the winter season.

Additional sources of recorded mortality included 43 road kills and 18 poached animals along the Copper River Basin road system during the period November 1985 to March 1986. Fish and Wildlife Protection Division staff reported a significant increase in caribou harvest violations during the winter hunt. The increase is associated with the greater number of participants this year.

Management Summary and Recommendations

This year's population estimate for the Nelchina Caribou Herd indicates the steady population increase first observed in the mid-1970's has continued through 1985. While the numbers of permits issued and people hunting remained about the same as last year, the number of caribou killed dropped slightly, a result of the decrease in fall season length.

Nelchina caribou hunters are capable of taking large numbers of caribou in a short period of time. From 1981 through 1984, 764 caribou, on average, were taken during 32-day fall seasons. In 1985, with a 10-day fall season, hunters were still able to harvest 475 caribou. Such a capability should be recognized during any consideration of opening the Nelchina Caribou Herd to a general hunt.

We estimate that 1,000 permittees hunted Nelchina caribou during the 60-day winter antlerless season. Usually, during that period (January and February), just adult bulls and calves are antlerless. Although the 1985-86 season did not result in an increase in overall harvest, it did substantially increase and focus hunting pressure onto a narrow strip of winter range

along the Glenn Highway (Milepost 130 - Milepost 185). This area apparently is a traditional wintering area for bulls, which, unlike wintering cows, do not wander widely but remain fairly sedentary within relatively small, established winter ranges. Most of the 520 caribou reported taken during the winter season came from this strip. While the total number of bulls harvested during the winter was not of concern, the potential for completely eliminating or displacing bulls from specific traditional wintering areas is of concern. If winter hunts of this magnitude are continued, regulations to control hunting pressure along the Glenn Highway should be considered. Fish and Wildlife Protection Division staff indicated that complaints and associated enforcement efforts this year were on the order of 5 times what they had been during the prior few winters.

It is further recommended that the overall number of permits continue to be adjusted in response to estimated herd size.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 13E and 20C

HERD: Denali

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

No open season.

Population Status and Trend

No population estimates were made during this reporting period. In 1984 the herd was thought to number between 2,000 and 2,500 based on a fall 1984 survey by the National Park Service. The Denali Herd is stable or increasing slightly.

In 1985 a calf caribou radio-collared by the National Park Service left the Denali Herd and wintered with what is believed to be a separate calving group of caribou in the Tonzona drainage. The radio-collared calf remained there during calving season. Tonzona and Denali caribou may have a relationship similar to that of the Delta and Yanert Herds in which some interchange takes place, but does not occur to any great extent. The Tonzona caribou are thought to number between 200 and 400.

Population Composition

On 25 September 1985, a composition count of 1,205 caribou was conducted by Park Service personnel. Among caribou classified, 654 were cows, 368 were bulls, and 183 were calves. The numbers of calves:100 cows and bulls:100 cows were 28 and 56, respectively.

Layne Adams of the Park Service conducted another composition survey on 19 April 1986, with which I assisted. We found and classified 506 caribou, of which 359 were cows, 91 were calves, and 56 were bulls. The calculated calf:100 cows ratio was 25, which may be somewhat lower than in previous years. April composition counts have only been done since 1984. In 1984 there were 46 calves:100 cows, and in 1985 there were 34 calves:100 cows. The number of calves in the 1986 survey could have been underestimated because there was considerable segregation of bulls and cows, and many calves could have been with the bulls.

It may be significant that the fall calf:100 cows ratio has also declined, from 36 in 1984 to 25 in 1985 (see the following discussion on mortality). Also, it has been difficult to get an even distribution of composition samples because there are no adult caribou with radio collars. Park staff biologists, in cooperation with the Department, plan to radio collar 30 adult caribou during September 1986.

Mortality

For the 3rd consecutive year, Park Service biologists collared newborn calves to determine causes of neonatal mortality. Results of the 1986 collaring effort were more similar to 1985 than 1984 figures (Table 1). Mortality rates and cause of death seem to vary from year to year. The herd is relatively small, and if calving areas are located in the proximity of wolf dens, mortality can be great. Layne Adams believes loss of Denali caribou to wolves was high during the 1985 and 1986 calving seasons.

Results of the calf mortality study appear to corroborate the lower trend in calf:100 cow ratios obtained in composition counts.

Management Summary and Recommendations

The unhunted and unmanaged Denali Herd serves as a valuable comparison with the adjacent Delta Herd which is hunted and intensively managed. The Denali Herd spends most of the year within Denali National Park and would provide little opportunity for hunters unless the population increased greatly in size and expanded its range. There is essentially no harvestable surplus and the season should remain closed.

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Table 1. Results of National Park Service calf mortality study, Denali Herd.

Year	Calves collared	Number of calves dying by 30 June (%)	Cause of death			
			Wolves	Grizzly bears	Other predation	Unknown
1984	43	13(30)	--	12	--	1
1985	59	33(57)	10	14	8	1
1986	58	29(50)	11	9	6	3

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 15

HERD: Kenai Lowlands

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Kenai Lowlands Caribou Herd was established through transplants from the Nelchina caribou herd by the Department of Fish and Game in 1965 and 1966. The herd currently numbers about 85 animals and ranges over portions of Subunits 15A and 15B. Population growth since the mid-1970's has been slow. The potential caribou range available to this herd is not considered a limiting factor; however, predation on young calves (<30 days old) by domestic dogs and/or wild carnivores is strongly suspected of limiting annual recruitment.

Mortality

Hunting of this herd has not been allowed since 1981, due primarily to opposition by U. S. Fish and Wildlife Service personnel at the Kenai Refuge. This agency is concerned over potential conflicts with the nonhunting public's interest in viewing these caribou, and concern about the limited growth rate of this herd.

Management Summary and Recommendations

Low recruitment has been the primary management concern for the Kenai Lowlands Caribou Herd for the past decade. Both Alaska Fish and Game and U. S. Fish and Wildlife Service biologists suspect that predation by free-ranging dogs and wild carnivores is controlling this herd's growth. However, until specific mortality factors are identified, appropriate management action cannot be initiated. A study involving radio collaring neonate calf caribou is recommended to determine specific causes of calf mortality.

Since the primary reason for reestablishing caribou on the Kenai Peninsula was to provide public hunting opportunities, it is recommended that there be a limited permit hunt in 1987.

Such a hunt would be in accordance with the Department's policy of providing for controlled and limited hunting on small, but otherwise secure, big game populations. An appropriate season and bag limit would be 15 September to 15 October, for 1 bull per hunter, by drawing permit only. The number of permits (5 or less) should be determined from the number of animals observed in the 1986 fall survey.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 18

HERD: Kilbuck Mountains and Andreafsky Mountains

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Kilbuck Herd, which currently numbers about 60-70 caribou, calves in the upper Kisaralik and Kwethluk drainages in the western Kilbuck Mountains. More calves (22) were found in this area during May 1986 than have been observed in past years. In addition, we believe that dispersing Mulchatna Herd caribou are also found in the central Kilbuck Range in the northern Tikchik Lakes near Aniak Lake, and in the upper Kisaralik drainage in Subunits 17B and 19B and in Unit 18, from late July until early spring. Caribou from the Kilbuck and Mulchatna Herds probably overlap in range in the central Kilbuck Mountains.

The Kilbuck Herd appears to have partially recovered from previous overharvests. The Board of Game closed caribou hunting in GMU 18 south of the Yukon River in June 1985. Increased aerial reconnaissance during 1985-86 by the U. S. Fish and Wildlife Service (USF&WS), Fish and Wildlife Protection (FWP), and ADF&G increased our knowledge of this small, remnant population.

The caribou population in the Andreafsky Mountains of northern GMU 18 is also made up of 2 components. The small Andreafsky Herd contains approximately 200 caribou and feral reindeer and is located in Unit 18 and Subunit 22A in the vicinity of Needle Mountain, and in the headwaters of the Andreafsky River drainage. I believe that this resident herd is stable in population size. Several large groups of caribou from the Western Arctic Herd (WAH) were also present in southern Subunit 22A from November 1985 to early January 1986. Unverified reports indicate that these groups may have included over 5,000 caribou. WAH caribou retreated from the area by late January 1986, presumably due to heavy hunting activity. Although no range overlap has yet been demonstrated between the Andreafsky Herd and the Western Arctic Herd, it probably does occur.

Population Composition

Two aerial composition surveys were conducted by USF&WS and ADF&G staff in the Kilbuck Mountains during 1985-86. Sixty caribou were observed in the upper Kisaralik drainage on 16 and 20 September 1985. Sex and age classifications were as follows: 11 bulls, 8 cows, 4 calves, 4 yearlings, and 33 individuals unclassified. USF&WS staff conducted another composition survey on 15 May 1985 in the calving area of the Kilbuck Herd in the upper Kisaralik and Kwethluk Rivers. Two herds composed of 38 cows and 22 calves were observed.

Distribution and Migration

Aerial distribution surveys were flown by USF&WS and ADF&G staff in the Kilbuck Mountains on a monthly and, in some cases, biweekly basis during the reporting period. Seven caribou were observed by ADF&G staff on a snowfield west of Aniak Lake on 1 August 1985 in Subunit 19A, immediately adjacent to GMU 18. A small band of 11 caribou, including 2 bulls, 7 cows, and 2 calves, was regularly observed by staff near the upper Kisaralik River during October and February. These animals are probably from the resident Kilbuck Herd.

USF&WS biologists observed 46 caribou at the headwaters of the Quicksilver drainage north of the Kisaralik River on 3 February 1986, and an additional 93 caribou were seen in the same area on 1 March 1986. These 93 caribou were probably Mulchatna Herd animals that may have arrived in Unit 18 from the upper Kipchuk drainage in Subunit 19A. The caribou may have either fragmented into small groups or subsequently departed from the area, as such a large band was not seen again. We have repeated indications that Mulchatna herd caribou enter Unit 18 from the Kipchuk drainage after moving west from their calving grounds in Subunits 17B and 19B. I believe that these caribou follow a counterclockwise pattern and return eastward from Unit 18 into Unit 17 by late winter and early spring. Verification of this hypothesis awaits proposed radio-tracking efforts.

Three separate groups of caribou, composed of 47 individuals, were observed by USF&WS staff in the Quicksilver and Kisaralik drainages on 3 April 1986. Eleven caribou were seen near the upper Kisaralik River on 7 April, and 33 caribou were seen there on 16 April. Herd identity of these animals is not known. No caribou were observed in the upper Eek River drainage during a survey flight conducted on 18 April. Numerous old trails were present throughout the area, however, indicating heavy utilization in the past, perhaps by reindeer in the 1930's. Forage vegetation (lichens, grasses, and forbs) was abundant and appeared recovered from previous grazing pressure. The upper Eek drainage appears to be quality caribou habitat.

Eleven adult caribou, believed to be Kilbuck Herd animals, were observed by USF&WS staff near the upper Kwethluk River at Fork Creek on 22 April 1986; 7 caribou were seen near the mouth of Quicksilver Creek on 8 May.

Two groups of 63 Kilbuck Herd caribou and newborn calves were observed by USF&WS staff in the upper Kisaralik, and for the 1st time, in the upper Kwethluk drainage along Crooked Creek on 15 May. The crooked Creek drainage and associated tributaries from Heart Lake downstream to Swift Creek and the upper Kisaralik drainage appear to be the core calving area for the resident Kilbuck population. The caribou appear to be selecting this area for 2 primary reasons: lichens and other forage species are abundant in the vicinity, particularly on the lower slopes; and secondly, the numerous peaks, steep slopes, and excellent visibility allow superior predator avoidance.

The sighting of neonate calves is significant. The calving period is within the dates reported for wild caribou, not feral reindeer. The calving also confirms our belief that a portion of the caribou population in the Kilbuck Mountains forms a resident herd. Follow-up surveys only 6 days later revealed a dramatic decrease in the number of caribou on the calving grounds.

USF&WS staff observed 56 caribou during survey flights conducted from 16 to 18 June along Quartz Creek, Crooked Creek, and the headwaters of the Kisaralik drainage. The majority of the caribou had vacated the calving grounds and moved to lower elevations, concentrating at the elevational limit of new plant growth.

Occasional reports from the public concerning Kilbuck caribou were received during the 1985-86 reporting period. A pilot reported 10-12 caribou in the upper Kanukik drainage between the Kanektok and Goodnews Rivers on 11 October 1985. Four caribou were seen at intervals between 15 September and 8 November 1985 by a trapper residing at North Fork Lake near the Kisaralik River. Three of the caribou appeared as scattered individuals traversing Aniak Lake pass, lending credence to the belief that these were animals dispersing from the Mulchatna Herd into Unit 18.

USF&WS staff observed 126 caribou/reindeer in 4 groups at the headwaters of the Andreafsky River during 2 survey flights conducted in September 1985. These were probably resident Andreafsky Herd animals. During November, ADF&G staff confirmed (by radio tracking) the presence of significant numbers of WAH caribou south of the Unalakleet River. The largest group of caribou, about 2,500 animals, was located in southern

Subunits 22A and 21E. A knowledgeable observer from St. Michael reported large numbers of caribou in southern Subunit 22A and northern GMU 18 from November 1985 to early January 1986. The largest concentration of these caribou was located on Akeetfuganuk ("Glove") Mountain in early January, moving in a southwesterly direction. Another group of caribou, reported to number approximately 2,500-3,000 animals, was located immediately north of The Sisters, a volcanic formation 10 miles SE of St. Michael. An additional group of caribou, approximately 300 animals, was said to have come southwestward towards Unit 18 from Otter Creek and the Golsovia River in southern Subunit 22A. About 100 caribou were scattered about Klikiterik Mountain in early January. Another mixed group of caribou and feral reindeer was reported between Crater Mountain and St. Michael.

A USF&WS survey flight in late January included the East Fork of the Andreafsky River, the upper North Fork of the Andreafsky River, The Sisters, and portions of the Golsovia and Anvik Rivers. Only 5 caribou were observed near Needle Mountain in northern GMU 18 on this flight. Tracks of another 75 caribou (reindeer?) were observed near The Sisters and along the East Fork of the Andreafsky River. ADF&G radio-tracking efforts confirmed that WAH caribou were moving northeastward across the Unalakleet River.

Mortality

No information was obtained from returned caribou harvest reports in GMU 18 during the 1985-86 regulatory year. Caribou hunting remained closed in Unit 18 south of the Yukon River during 1985-86. Hunting had reduced the Kilbuck Herd from about 200 caribou to less than 100 during the winter of 1984-1985. After extensive discussion with local leaders in advisory committees and regional councils, and with notification by letter, radio, TV, and newspaper, the Board of Game closure of caribou hunting in the Kilbucks met with cooperation by most Unit 18 residents. Enforcement action, however, followed the discovery of a caribou-poaching incident in the Kilbucks during March 1986. A small herd of 10-12 caribou, resident along the upper Kisaralik River, was harvested on 18 March 1986 by hunters using snow machines. Coordinated interagency investigative efforts (FWP, USF&WS, and ADF&G) followed, but the hunters were not found. Resultant publicity over this incident elevated the issue of caribou conservation in the Kilbuck Mountains enormously and focused attention on this small, remnant population.

Relatively little is known about other sources of mortality in Unit 18. Fresh wolf tracks were observed in early April in the Kilbucks around the kill site where 10 caribou were harvested

in March. Other solitary wolf tracks were seen on occasion in the Kilbuck Mountains, although no other interactions between wolves and caribou were reported.

Brown bears are frequently observed in the upper Kisaralik and Kwethluk drainages and apparently are attracted to the calving grounds. By keeping to steep, elevated, and rough terrain, the caribou can detect predators from a distance. The caribou remain in the calving grounds only for a few days until newborn calves are able to travel. Brown bears have been observed on ridges within 1 mile of calving caribou. Calf mortality appears to be especially high during the 1st month. Observed calf:cow ratios dropped from 80 calves per 100 cows in May to 44 calves per 100 cows in June. Because sample sizes are small, however, conclusions should be regarded as preliminary.

Management Summary and Recommendations

Present caribou range and distribution in GMU 18 do not reflect reported historical distributions. Apparently, caribou in the Yukon-Kuskokwim Delta ranged over a much larger area 100 years ago, including Nunivak Island and the Romanzof area near Hooper Bay (Oswalt 1952). Movement of caribou between the Kilbuck and Andreafsky Mountains across the Kuskokwim River has been documented from archeological excavations (Oswalt 1962). Present distribution of caribou in GMU 18 is limited to the upper Kisaralik and Kwethluk drainages of the Kilbuck Mountains and to the headwaters of the Andreafsky River near Needle Mountain in the Andreafsky Mountains. Potential habitat includes almost all historical range in GMU 18. The exceptions are Nelson Island which may soon be occupied by domesticated reindeer, and Nunivak Island which already has a reindeer herd. Coastal lowland in GMU 18 has served as lower-density habitat, occupied when populations were high. Lichen-dwarf shrub peatland below 400 feet mean sea level (MSL) is potentially useable as moderate-density, autumn, winter, and spring habitat. Current distribution of caribou in GMU 18 usually occurs above 1,500 feet MSL, with post-calving groups occupying subalpine scrub and dwarf shrub heaths in well-drained foothills and submontaine plateaus.

The present caribou population in the Kilbuck Mountains is made up of 2 components. A small resident herd, comprising 60-70 caribou, calves in the upper Kisaralik and Kwethluk drainages. Other caribou from the Mulchatna Herd are found in low numbers throughout the central Kilbuck Range from late July to early spring. Kilbuck and Mulchatna caribou overlap in range in late summer and winter. Closure of the season in GMU 18 south of the Yukon River has allowed the Kilbuck Herd to recover, but, for the foreseeable future, any hunting of this group would seriously inhibit population growth. I recommend that the caribou season south of the Yukon River remain closed.

The caribou population in the Andreafsky Mountains is also made up of 2 components. A small herd of 200 caribou and feral reindeer resides in northern Unit 18 and southern Subunit 22A in the vicinity of Needle Mountain and in the drainage of the upper Andreafsky River. Several large groups of WAH caribou were present along the border of GMU 18 and 22 during early winter 1985-86. Although range overlap has not been demonstrated between these 2 groups, it probably does occur. I recommend no changes in season and bag limit for caribou in Unit 18 north of the Yukon.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 19 and 21

HERD: Beaver Mountains, Kuskokwim Mountains, Sunshine Mountain, Big River, Rainy Pass, and Tonzona

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Based on sightings of radio-collared caribou, the Beaver Mountains, Big River, and Sunshine Mountain Herds remained more dispersed throughout the year than in the past. Several radio-collared caribou were not located on various relocation flights, particularly during spring. Batteries in the radios are over 4 years old and may have failed or worked intermittently. It is likely that the Beaver Mountains, Big River, and Sunshine Mountain Herds have continued to decline. The Big River Herd has declined considerably during the past 3 years. The apparent population trend is unknown for the Kuskokwim Mountains, Rainy Pass, and Tonzona Herds.

Mortality

Caribou harvest reports indicate only the minimum harvest because there has been little enforcement of reporting requirements for several years.

Five hunters reported taking 3 caribou from the Beaver Mountains Herd, and I estimate that the actual harvest was between 10 and 15 caribou. Hunting pressure has declined in the past 2 years. Predation by wolves and bears is the largest source of mortality for the herd.

Eighteen caribou were reported harvested from the Big River Herd during the fall season. Some caribou were taken by Nikolai residents during the winter season but were unreported. Total estimated harvest was 35-40 caribou. The Big River Herd did not remain on the flats between Nikolai and McGrath as long during the winter as in past years, so caribou were less available to hunters.

No caribou were reported taken from the Sunshine Mountain Herd, and because very few wintered in the lower Nixon River flats, there probably were no caribou taken from this herd. Bear and wolf predation continues to be the principal mortality factor affecting the Sunshine Herd.

Two caribou were reported taken by 5 hunters in the Kuskokwim Mountains and the estimated harvest was 10 caribou. The Rainy Pass Herd remains the most intensely hunted of the several small herds in Units 19 and 21. Thirty-nine caribou were reported taken by 52 hunters, and the estimated take was 50-60 caribou. Harvests and hunting pressure have remained relatively constant during the past 4 years.

Five hunters reported taking 5 caribou from the Tonzona Herd, and the estimated take was 10-15 animals.

Management Summary and Recommendations

The apparent decline in the Beaver Mountains, Sunshine Mountain, and Big River Herds has continued. Without relief from predation, the herds will probably continue to decline. Efforts are being made to redirect nearly all caribou hunting in Unit 19 to the expanding Mulchatna Herd.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20A

HERD: Delta and Yanert

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

Since 1980, the Subunit 20A caribou population has been thought of as comprising 2 groups: the Delta and Yanert Herds. Prior to 1983 the Delta and Yanert Herds displayed fidelity to separate traditional calving areas. Since summer 1983, seasonal ranges have overlapped, and during May 1984 marked females of the Delta Herd shared a calving ground with Yanert females in the upper Wood River area. Therefore, the question of herd distinction remains unsettled.

The caribou population in Subunit 20A apparently doubled between 1979 and 1986, but there is some evidence that the rate of growth has declined in the past 2 years. A combined Delta-Yanert Herd photocensus, conducted in late June 1986, revealed a minimum population of 8,300 caribou. The 1985 combined estimate was 8,100 caribou; the 1984 estimate was 6,300 caribou. An independent census of the Yanert Herd was not conducted during 1985 or 1986; however, at least 500-700 caribou have occupied the Yanert River drainage year-round during the 1980's.

Population Composition

Sex and age composition of both the Delta and Yanert Herds was estimated from surveys by helicopter during October 1985. Overall, the Delta Herd had 49 bulls:100 cows, 35 calves:100 cows (n = 1,164). Calves composed 20% of the sample. Comparable ratios observed in 1984 were 42:100 and 35:100, respectively. Bull:cow and calf:cow ratios were substantially lower in the central foothills subsample than in the western Subunit 20A subsample.

In the Yanert River drainage, 787 animals were classified. Two marked animals from the Delta Herd were among these, however, suggesting the sample was mixed. Bull:cow and calf:cow ratios were 65:100 and 40:100, respectively.

Mortality

During 1985, 603 hunters reported taking 396 caribou in Subunit 20A; 317 were from the Delta Herd, 64 from the Yanert Herd, and 15 from unspecified locations. The reported harvest contained 317 males, 75 females, and 4 of undetermined sex. The Delta harvest contained 79% bulls, the Yanert, 82% bulls.

During 1984, 85% of the Subunit 20A harvest was reported taken from the Wood River drainage and westward. During 1985 the Subunit 20A harvest was more evenly distributed; 40% was taken east of the Little Delta drainage, 28% from the Dry Creek drainage to the Totatlanika River, and 32% in the drawing permit area west of the Totatlanika River (Table 1).

The harvest from the Tier II drawing hunt for the Delta Herd was 102 caribou. Two hundred sixty-six individuals applied for 200 permits. Thirty-five of the permit holders did not return the hunter report; 21 of the reporting permittees did not hunt.

Hunter success for all of Subunit 20A was 66%. In the Delta Tier II permit hunt, success was 71%, and in the general-season Delta hunt 74% were successful. Most successful hunters (78%) used airplanes for access to the Delta general hunt; three-wheelers (61%) were used to hunt the permit area west of the Totatlanika River.

Reported hunter success was relatively low (47%) in the Yanert Controlled Use Area. Though the caribou season was open for 6 months, 50% of the harvest occurred during the 1st 2 weeks of September, and 70% took place by the end of October. Horses (37%) and highway vehicles (42%) were the common modes of transportation for successful hunters.

The reported harvest for Subunit 20A represents 5% of the known minimum population. Unreported harvest and crippling losses associated with hunting could account for another 5% at most. Fall recruitment of calves during the past 2 years has been about 20%. Therefore, a natural mortality rate greater than 10% of the fall caribou population could, in concert with the harvest, stabilize herd growth or initiate a decline.

Mortality among marked caribou during winter and spring 1986 was the highest single-year mortality since Delta caribou were first collared in 1979. Since 1 January, 5 of 49 radio-collared caribou have died: 4 were killed by wolves, 1 by a snare.

Composition surveys flown during late April and early May 1986 gave no indication of disproportionate calf mortality. Observed spring calf:cow ratios in the Delta (29:100) and

Yanert (49:100) Herds were similar to those observed during fall composition counts.

The significance of grizzly bear predation on Subunit 20A caribou is unknown. One radio-collared caribou was thought to have been killed by a bear in late September 1985, and Department biologists saw a bear kill 2 caribou calves in May 1986.

Management Summary and Recommendations

Caribou numbers in Subunit 20A have doubled since 1979, but the rate of growth has been declining. Rates of immigration and emigration, as determined from movements of marked animals, are not affecting population levels. Indicators of nutritional status or disease do not suggest a problem. According to Davis and Valkenburg (1985), "Exploitation by man and predation (primarily wolves) appear to have had the most effect on the Delta Caribou Herd's demography."

Predation by wolves on Delta caribou has apparently been a significant mortality factor throughout the documented history of the herd. Following wolf removal programs beginning in 1954 and again in 1976, caribou numbers increased rapidly for 5-8 years, then stabilized. During the mid-1970's wolf predation had a significant impact on summer calf survival.

However, comparison of fall and spring calf:cow ratios indicates no disproportionate mortality of calves during winter.

Winter aerial surveys, reports from trappers, and incidental observations indicate wolf numbers in the range of the Delta Herd are approaching the 1975 pre-control level. The declining rate of increase in population size and apparent increasing predation rate on adults, as indicated by the marked sample, suggest wolf predation has again become a significant mortality factor.

Given current recruitment and natural mortality rates, caribou numbers in Subunit 20A can be maintained. Harvests should not exceed 400 caribou, of which no more than 50 should be taken from the Yanert River drainage. Increased monitoring of the wolf population in Subunit 20A is needed to fully assess the impact of wolf predation on moose and caribou populations in the area.

The current management objective for the Delta and Yanert Caribou Herds calls for a minimum of 6,000 caribou. However, during the next reporting period a thorough review of Subunit 20A caribou management is planned and the potential for herd

growth beyond the present level will be examined. The results of a current study on range quality and distribution of caribou relative to snow distribution will add to our understanding of caribou movements and energetics.

Increased harvest monitoring will be a priority during fall 1986 to increase the accuracy of harvest data, particularly in the Yanert drainage. Season dates may need adjustment in the future to control harvest of the Yanert Herd.

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Table 1. Harvest, by location, of the Delta and Yanert Caribou Herds, 1985.

Location	Males	Females	Unspecified	Total
Delta Herd				
Delta Creek	17	11	0	28
Delta River	13	3	0	16
Dry Creek	21	2	0	23
Healy Creek	4	1	0	5
Iowa Ridge	24	6	0	30
Little Delta River	33	19	0	52
Tatlanika River	11	0	1	12
Totatlanika River	5	1	0	6
Wood River	37	5	1	43
Delta Herd Permit Hunt	86	15	1	102
Total Delta Herd	251	63	3	317
Total Yanert Herd	53	11	0	64
20A unspecified location	13	1	1	15
Total 20A harvest	317	75	4	396

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20D

HERD: Macomb

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Macomb Caribou Herd was estimated to number 700 during fall 1985. The known minimum population was 610 at that time. The population is believed to be stable or slowly increasing.

Population Composition

The sex and age composition of 518 caribou in 9 different groups was determined on 30 October 1985. There were 45 total bulls (19 of which were small bulls), and 31 calves:100 cows. Calves composed 17% and small bulls 11% of the sample.

An aerial classification count on 18 June 1986 indicated that among 470 caribou observed, there were 31 calves:100 caribou older than calves. No large bulls were seen in aggregations during this survey.

Mortality

In 1985, 134 individuals applied for the Macomb caribou hunt. Applicant numbers were lower than in 1984 because of a changed interpretation of the state subsistence law. All applicants received permits.

Of the 134 permittees, 55 reported hunting, and 12 harvested bulls. The season opened 21 September, and the late opening may have kept many hunters from participating. Most successful hunters used horses. The remainder walked in. Aircraft transportation is permitted at Fish Lake, but few hunters flew to the lake. All caribou harvested were taken in the vicinity of the Macomb Plateau.

No other mortality was observed, but wolves and grizzly bears are believed to be important predators. Persistent snow cover in May 1986 may have reduced calving success.

Movements

Approximately 200 caribou, known to be part of the Macomb Herd, were observed in the Granite Mountains. Although a small number of caribou inhabit the Granite Mountains all year, this is the 1st recorded movement of known Macomb Herd caribou into that area. The 200 Macomb caribou apparently returned to their core range in late winter or spring.

Another extension of range was observed to the east. Approximately 50 caribou were observed on slopes of the Alaska Range due west of Cathedral Bluffs. Caribou movement in this direction has been postulated, but never recorded.

Management Summary and Recommendations

Survey data suggest that the Macomb Herd is increasing in size. Further signs of an increasing population are: (1) the increased calf survival shown in recent years, and (2) extension of the herd's range. Status of the herd should be accurately determined during 1987 and 1988 so that appropriate changes in regulations can be made. If funds are unavailable for annual population assessments, biennial surveys may provide information acceptable for management purposes.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20E

HERD: Fortymile

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The management goal of providing for maximum opportunity to hunt caribou is not currently being met, nor has the interim minimum population objective of maintaining 50,000 adult, pre-calving caribou been achieved. The Fortymile Herd currently occupies only a portion of its former range.

A photocensus of the Fortymile Herd was conducted in June 1986, but the photographs were not processed in time for this report. The herd was last censused in June 1984 when 13,073-13,731 (high and low counts) caribou were counted from photos. At that time the herd was estimated to number 14,000.

Based upon the results of the fall 1985 and early spring 1986 surveys, the 1985 calf production/initial survival was high (48 calves:100 cows) in June 1985. In October 1985, the calf:cow ratio was 36:100, and in April 1986 the observed ratio was 40 short yearlings:100 cows. If the herd experienced an overall natural mortality rate of 8% and a hunting loss of 3%, it is likely that the herd grew modestly during this reporting period due to good survival of the 1985 cohort. No composition survey was conducted in conjunction with the June 1986 photocensus.

The bull:cow ratio during October 1985 (post-hunt) was 50 bulls:100 cows. Thus, the ratio declined only slightly from the 54 and 60 bulls:100 cows observed in 1982 and 1983, respectively. No fall 1984 survey was conducted. This change in bull:cow ratio is expected given the number of bulls harvested in recent years, and assuming that each sample accurately reflected the adult sex ratio within the population.

Seasonal Concentrations and Movements

During summer and early fall 1985, the herd was widely distributed throughout the mountainous northwestern portion of its range, and during this period fewer caribou were observed in the southwestern and southern portion of the herd's range than in 1984. The fall migration began in September 1985, later than in 1984 but earlier than in other recent years. In 1985 the 1st caribou reached the Taylor Highway near Mt. Fairplay, in their easterly migration, on 20 September. The caribou lingered near the highway for over a week, grazing on newly seeded and fertilized grasses intended to minimize erosion associated with road construction. The herd then crossed the highway, rutted, and moved north toward Prindle Volcano, and then crossed the highway again heading northwest toward Slate Creek. The herd wintered northwest of Chicken, essentially unavailable to late-season caribou hunters.

Mortality

Predation by wolves, grizzly bears, and golden eagles is believed to be the primary mortality factor limiting growth of the Fortymile Herd. This herd has shown noticeably higher calf survival and yearling recruitment since the Department conducted wolf control during winters 1981-82 and 1982-83. The ratio between caribou and wolves widened appreciably during and immediately following wolf control, due to increased caribou survival and fewer numbers of wolves. Wolf numbers have since increased to 80% of pre-control numbers, and there is some evidence that the diet of wolves presently includes a higher proportion of caribou than previously. If the apparent trend holds true, the future rate of caribou population increase is expected to decline, and the population may stabilize below the interim objective of 50,000 adult caribou.

Consumptive use of the Fortymile Herd has been limited to 3% of the herd annually and restricted to bulls only. During this reporting period, 247 successful hunters reported taking 261 bull caribou, most of which (n = 226, 87%) were taken during the early season. Based upon past experience, it was assumed that only 63% of successful hunters reported their caribou harvest. Therefore, the actual harvest was probably around 400 bulls, comparable to the 1984 estimated harvest of 388 bull caribou.

The 1985 total reported harvest of 261 caribou was very close to the 245 reported taken during the early season in 1984. In 1984, the season was closed by Emergency Order after 10 September due to an extremely early fall migration and

associated heavy harvest along the Taylor Highway on 31 August. During the winter of 1985-86, the herd stayed mostly in inaccessible areas northwest of Chicken, and only 34 bulls were reported taken during the entire late season. Normal winter distribution of the herd during the winter of 1985-86 could have led to a 2nd Emergency Order to prevent overharvest. Interest in hunting this herd is increasing. Harvest tickets indicate that 692 hunters sought caribou from the Fortymile Herd in 1985, but given the high rate of non-reporting, over 1,000 hunters likely participated in the hunt.

Management Summary and Recommendations

The Fortymile Herd has shown moderate rates of increase only during or shortly after periods when wolf control has been conducted. Wolf control should be resumed until the interim caribou population objective of 50,000 adults is attained. The interim caribou population objective cannot be reached for many years, and the management objective of providing maximum opportunity to participate in hunting caribou cannot be attained with a herd currently numbering about 15,000. The herd is not using historical range west of the Steese Highway, a hunting area formerly important to residents of Fairbanks. Last season, hunting near the Taylor Highway had to be closed, and the 1986-87 season will be restricted to local subsistence hunters during winter. The limit will be 1 bull. Sufficient unoccupied range exists in Alaska and Yukon Territory, Canada, to support a much larger herd capable of meeting management objectives.

Harvests should be restricted to less than 3% of estimated herd size and held to bulls only until the interim population objective is attained. If necessary, permits should be considered to limit early season harvests to assure that a late season hunt can occur within the constraint of a maximum 3% harvest. Many local people who rely upon caribou lack facilities for freezing fresh meat prior to freeze-up.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 21D, 22A, 22B, 23, 24, and 26A

HERD: Western Arctic

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

A photocensus of the Western Arctic Herd (WAH) was unsuccessfully attempted during July 1985. This attempt was described in the 1984-85 progress report (Anderson and James 1986). During July 1986, another photocensus was attempted and successfully completed. The results were not available during the writing of this report and will be included in next year's report. All staff involved with the 1986 photocensus believed that the number of caribou observed was substantially higher than the 173,000 animals counted in the 1982 photocensus. When the 11% annual increase documented between 1980 and 1982 is applied to the 1982-86 period, a herd size estimate of 250,000 animals results. However, Davis and Valkenberg (1985) determined that the growth rate of the WAH is likely to decline as herd size increases, and predicted a 1986 population of about 241,000.

Calf production was assessed by photographing post-calving aggregations; 9x9-cm aerial photographs were taken at 750-1,000 feet above ground level. The photographs were taken on 6 July 1985 in the upper Kokolik and Utukok drainages. Using 13 photographs, we counted 6,207 caribou, of which 1,858 (30%) were calves. The 1985 results are similar to results obtained between 1960 and 1980 (Table 1). The WAH underwent robust growth between 1975 and 1980, and the 1985 data suggest adequate productivity for continued growth. It is of interest that 16%, 18%, and 20% calves, for the years 1961, 1968, and 1970, respectively, were obtained prior to a precipitous decline of the WAH which was not documented until 1975-76. If future July productivity surveys result in calf percentages similar to those observed from 1961 through 1970, further investigation is warranted.

During late August through September 1985, we collected mandibles from over 100 mature male caribou killed by hunters on the Kobuk River. This was the 1st year of the program and we plan on continuing it in future years. We anticipate that mandible measurements collected over a number of years will be useful in developing a history of nutritional status of WAH animals. Mandible size directly reflects skeletal growth rate and indirectly reflects nutritional status. Such data gathered over many years should allow us to detect changes in nutritional status before productivity and recruitment are adversely effected. Results will be included in future progress reports.

Population Composition

Spring composition surveys were conducted during late March and early April in Unit 23 (Tables 2 and 3). No spring surveys were conducted north of the Brooks Range in Subunit 26A because radio-tracking and reconnaissance flights indicated that relatively few caribou were in that region. Short yearlings constituted 19% of the 6,599 caribou classified. This percentage falls within the range previously reported for the WAH (Table 3). The 1985 and 1986 percentages of 15% and 19%, respectively, suggest that herd recruitment has declined from the peak of 26% observed in 1977 and 1979. Davis and Valkenburg (1985) reported that recruitment and the rate of increase in herd size should decline as the size of the WAH increases. However, sex and age segregation of caribou in spring undoubtedly results in some sampling error and the difference between 19% and 26% may not be statistically significant. The primary benefit of continuing spring surveys in the future is to detect gross changes (exceeding 10-15 percentage points) in short yearling percentages. A more refined sample design and larger sample sizes are probably necessary for consistently determining changes of less than 10%. Current priorities do not allow us to increase sampling effort, due to the high costs and time commitment incurred. As long as other demographic parameters indicate that the WAH is still growing or stable in number, we probably do not need to increase our sampling effort.

Evident from the data in Table 2 is the occurrence of segregation of short yearlings from females throughout the progression of the northward spring migration. The vanguard of the migration observed north of Rabbit River contained 10% short yearlings. Immediately south of the vanguard in the Selawik River area, short yearlings constituted 18% of the sample. Farther south along the migration route in the Selawik Hills, the percentage of short yearlings was 20%. Caribou had been present in the Mulgrave Hills during the entire winter of 1985-86 and had only begun to migrate when the survey was conducted. Therefore, I believe the effect of segregation of

short yearlings and females was minimal in this group and the 21% short yearlings observed was probably close to the actual percentage.

Anderson and James (1986) used 35 mm aerial photography to conduct a portion of the 1985 spring composition survey. The results were encouraging, and we employed aerial photography for the entire 1986 spring survey. Over 1,500 slides (Ektachrome, ASA 200-400) were taken during 4.5 days of aerial survey.

Evaluation of the technique centers around 2 questions: 1) whether aerial photography results in more accurate identification of caribou, and 2) whether it results in larger sample sizes for the same cost. It is our impression that aerial photography does not always result in more accurate identification of caribou. A substantial number of slides show caribou with ambiguous morphological characteristics that are impossible to resolve without actually observing the animals. Longer observation times are sometimes necessary, for example, to obtain a slightly different view of the profile, a closer look at the antlers, or an observation of behavior. However, the slides do make it possible for observers to cross-check identification criteria and they provide standardization that otherwise would be lacking. The main benefits of the slides may be for training new observers and refreshing the memory of experienced observers prior to conducting future surveys.

The goal of substantially improving the sampling efficiency of the spring survey by using aerial photography (Anderson and James 1986) was not completely realized. The 1986 spring survey required 4.5 days of aerial survey and 6.8 days to review the photographs. Hence, 584 caribou per working day were classified. Experience gained in 1985 and especially in 1986 would undoubtedly improve the efficiency of future photographic surveys. Even so, it is doubtful that more than 1000 caribou/working day could be classified from photographs; that figure is easily attainable using the direct-count technique (no photography). However, the use of photography would be advantageous in situations where adverse weather could limit the number of days available for a survey. Fewer good-weather days would be needed to complete a survey using photography since less time is needed to photograph a caribou group than to count and classify it directly.

Perhaps the greatest deficiency of the direct-count survey method is the difficulty of accurately classifying caribou in relatively large, dense groups. Aerial photography appeared to offer a possible solution. However, the best photographs

taken during the 1986 survey were in situations which would have also provided the best direct-count results; i.e., the caribou were in single file, viewed in profile, with no overlap of animals. Apparently, large, dense groups of caribou are difficult or impossible to classify accurately with or without aerial photography.

Distribution and Migration

During late August and early September 1985, 27 caribou were live-captured and radio-collared while crossing the Kobuk River. The number of functioning collars in the WAH was doubled and our ability to monitor distribution and migration, and to conduct photocensuses, spring composition counts, and calving-ground surveys was greatly improved.

Most of the WAH wintered south of the Brooks Range during 1985-86. Twenty-seven caribou radio-collared prior to 1985 were located between late October and mid-January. Eighteen of the radio-collared caribou were south of the Brooks Range divide, 5 were in the central Brooks Range, and 4 were on the North Slope. However, the North Slope figures may be misleading; 2 of the caribou are probably part of the Teshekpuk Herd and the 3rd animal has not calved with the WAH since 1983. Also, 2 of the 5 caribou located in the central Brooks Range have never calved with the WAH. Therefore, perhaps as many as 5 of the 9 radio-collared caribou located in the central Brooks Range and North Slope are not legitimate indicators of movements of WAH animals. Whatever the case, it is clear that the majority of the WAH wintered in the southern part of its range. Miscellaneous reports from the public support this conclusion. The relocation data for the 27 caribou radio-collared during fall 1985 were not used because we believe their distribution would not adequately represent the distribution of the entire WAH. Because the caribou selected for collaring were relatively close to each other, the likelihood of those animals wintering in the same area is very high. Experience indicates that in subsequent winters, however, those caribou will be uniformly distributed throughout the herd.

The southern migration extended as far west as Monument Mountain on the Seward Peninsula, and at least as far south as the upper Anvik River in Subunit 21E. Unverified reports indicate that WAH animals may have migrated as far south as St. Michael in Subunit 22A during December 1985. Also, caribou were seen in the upper Koyukuk River drainage for the 1st time in approximately 12 years. Radio-tracking flights on 31 October 1985 and 6 and 22 January 1986 were conducted to determine the extent of westward movement of caribou into reindeer-inhabited areas of the Seward Peninsula. Observations of caribou indicate that the westward migration on the

Seward Peninsula extended as far as the upper Koyuk River/ Monument Mountain area. On 6 January 1986, caribou were observed moving in a northerly direction about 10 miles north of Monument Mountain. However, the heaviest concentration, which contained several thousand caribou and included 3 radio-collared animals, was seen in the Granite Mountain area. On 22 January 1986, only 1 radio-collared animal was still near Granite Mountain, and it was apparent that most caribou had moved eastward off the Peninsula. There were no reports of major losses of reindeer caused by contact with caribou.

A calving ground distribution survey was conducted during 18-20 June 1986. This was 10-14 days later than when the survey is normally conducted. Thirty-three radio-collared cows were located. Eleven of the 33 were actually seen. None of the 11 had antlers and 10 were accompanied by calves. The east-west distribution of radio-collared caribou extended from 15 miles west of Igloo Mountain to the Howard Pass area, a distance of over 160 miles. The north-south distribution of collared animals was from the Brooks Range divide north to the headwaters of the Kodak River, an approximately 75-mile distance. The core calving area included Archimedes Ridge, Omicron Hill, Eskimo Hill, and Avingak Creek. The 1986 calving-ground distribution demonstrates even more vividly than last year (see Anderson and James 1986) the dynamic nature of the boundaries of the WAH calving grounds. Apparently, the calving area is increasing in size along with the size of the herd.

Mortality

Harvest data for the WAH is currently available from 3 harvest report systems: the WAH, Arctic, and statewide harvest reports. The WAH harvest report is specifically designed for use by individuals who live in the range of the WAH and will only hunt that herd. The Arctic harvest report is aimed primarily at individuals hunting the Central Arctic and Porcupine Herds, but is also used by hunters who travel to northwest Alaska from other areas of the state. The statewide harvest report is also used predominantly by nonlocal hunters who have picked up their licenses and harvest report cards from elsewhere in the state. The reported harvest from the 3 data sources for the 1985-86 season was 4,018 caribou (Table 4).

Alaska residents accounted for 95% of all hunters reporting on the WAH report system (Table 5). Nonresidents and hunters of unknown residency accounted for the remainder. Hunters who reside within the range of the WAH (local residents) reported 96% of the harvest. However, most hunters who reported on the

Arctic and statewide harvest report were not local residents. Hence, local residents accounted for 91% of the reported harvest (figure based on data from all 3 reporting systems [Table 4]).

We believe, as in past years, that the actual harvest was substantially higher than the reported harvest. The actual harvest by local residents, who account for most of the caribou taken, is substantially higher than reported. A detailed explanation of how we estimated the actual harvest during the 1984-85 season was included in last year's report (Anderson and James 1986). The assumptions upon which the 1984-85 harvest estimate was based are applicable to the 1985-86 season. We believe the reported harvest may account for as little as a quarter of the actual harvest--which may have been as high as 16,000 caribou.

Despite continued problems with harvest reporting by local residents, the WAH harvest report system does show signs of improvement. The number of overlays issued increased by 11% and the number of reports turned in increased by 5% (Table 6). The 1985-86 reported harvest of 3,798 caribou is a 63% increase compared with the 1984-85 harvest of 2,336 (Table 7). We believe improved compliance with the reporting system could have contributed as much to the increase in reported harvest as an actual increase in harvest. Likewise, the increase in the number of caribou killed per successful hunter could have resulted, in part, from more accurate reporting.

Only general information is available concerning the amount of wolf predation sustained by the WAH. One group of several thousand caribou wintered in the Mulgrave Hills west of the Noatak River. During spring composition counts conducted in late March 1986, only 1 fresh wolf-killed caribou was seen during 1.5 days of aerial survey. Two other possible kill sites were noted. Two to 3 dozen sites of hunters' kills were observed during the same survey. An individual hunting wolves in the same area about 1 month earlier reported very little indication that wolves were present. During 3 days of spring composition surveys in late March and early April, we noticed only a few wolf tracks in the vicinity of a group of 100,000 caribou. No kills were observed. We concluded that wolf predation in Unit 23 and Subunit 26A is very light.

We have little information on the level of wolf predation sustained by caribou in areas south of Unit 23. We believe, however, that wolf densities in the southern part of the WAH range are higher than in the north. Caribou probably sustain a higher level of predation during the 2- to 4-month midwinter period when they are in the southern portion of their range.

Management Summary and Recommendations

Demographic indices of the WAH during the 1985-86 report period suggest a growing, or at least stable, population. The WAH continued to expand into eastern and southern portions of its range. Radiotelemetry will continue to play a central role in all aspects of the Survey-Inventory program. The number of functioning radio collars should be maintained at the present level of approximately 40, and preferably, should be increased. Surveys of the winter range should be conducted to enumerate carcasses of wolf-killed caribou. Such surveys will provide a gross indication of the level of wolf predation.

Although hunters' compliance with the reporting requirement has increased, there is still much room for improvement. The WAH report system has simplified reporting considerably and appears to have encouraged more accurate and complete reporting by local residents. Seventy-seven percent of all hunters who were issued overlays eventually reported their harvest during 1985-86. Issuance of overlays continues to be a problem, however. Unless a hunter is issued an overlay, he cannot report his harvest. Some villages accounted for very few issued overlays even though many caribou were known to be harvested. Efforts to establish new license vendors and to encourage participation in the harvest reporting system should continue. In villages where license and overlay issuance continues to be a problem, independent harvest surveys should be designed and implemented.

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Table 1. Calf production of the Western Arctic Caribou Herd, July 1960-85[a].

Date	Total caribou	Total calves	% Calves
1960	1,885	568	30
1961	3,073	495	16
1968	4,062	725	18
1970	26,250	5,171	20
1975	5,069	1,617	32
1976	9,748	3,037	31
1977	20,601	6,071	29
1978	20,690	6,062	29
1980	17,893	5,940	33
1985	6,207	1,858	30

[a] 1960-80 data from Davis and Valkenburg (1985).

Table 2. Spring composition data for the Western Arctic Caribou Herd, 1986.

Date	Location[a]	Adults[b]	Short yearlings	Total caribou	% Short yearlings
1 April	North of Rabbit R.	429	47	476	10
1 April	Middle Selawik R. drainage	2,739	609	3,348	18
2 April	Selawik Hills	1,287	329	1,616	20
26 March and 2 April	Mulgrave Hills	917	242	1,159	21
Total		5,372	1,227	6,599	19

[a] All locations were within GMU 23.
[b] All caribou older than short yearlings.

Table 3. Summary of spring composition surveys of the Western Arctic Caribou Herd, March and April 1977-86.

Year	GMU	Adults	Short yearlings	% Short yearlings
1977[a]	NA	9,313	3,204	26
1978[a]	NA	7,814	1,567	17
1979[a]	NA	2,992	1,035	26
1980[a]	NA	7,823	2,559	25
1981[a]	NA	1,404	414	23
1982[b]	23, 26A	5,536	1,253	18
1983[c]	23, 24, 26A	6,727	1,648	20
1984[d]	23, 26A	4,047	936	19
1985[e]	23, 26A	7,207	1,275	15
1986	23	5,372	1,227	19

[a] Davis and Valkenburg (1985).

[b] Anderson and James (1983).

[c] Anderson and James (1984).

[d] Anderson (1985).

[e] Anderson and James (1986).

Table 4. Reported harvest of caribou from the Western Arctic Herd according to 3 nonoverlapping report systems, 1985-86.

GMU	WAH harvest report	Arctic caribou harvest report	Statewide caribou report	Total harvest
21D	38	0	0	38
22	1,020	0	1	1,021
23	2,365	38	108	2,511
24	20	21	1	42
26A[a]	320	37	14	371
Other units	35	N/A	N/A	35
Total	3,798	96	124	4,018

[a] Community of Anaktuvuk included in GMU 26A rather than GMU 24.

Table 5. Summary of Western Arctic Caribou harvest report system, by hunter residency, 1985-86[a].

Residency	Reports issued	Reports returned	Harvest
Alaska	1,114	851	3,745
Local[a]	993	760	3,644
Nonresident	52	50	44
Unknown	12	6	9
Total	1,178	907	3,798

[a] Resides with WAH range (GMU 21D, 22, 23, 24, 26A).

Table 6. Summary of overlays issued and returned reports, WAH Harvest Report System, 1984-85 and 1985-86.

GMU[a]	Overlays issued 1985	Overlays issued 1986	Percent change	Reports returned 1985	Reports returned 1986	Percent change
21D	--	48	--	--	38	--
22	351	336	-4	303	287	-5
23	517	636	+23	406	459	+13
24	--	4	--	--	4	--
26A[b]	118	100	-15	89	74	-17
Other units[c]	77	54	--	66	45	--
Total	1,063	1,178	+11	864	907	+5

[a] Indicates location of vendor that issued the harvest overlay.

[b] Community of Anaktuvuk included in GMU 26A, although actually within GMU 24 boundaries.

[c] Comparison between 1985 and 1986 not applicable for "Other units." The returned reports from Units 21D and 24 were put in the "Other units" category in 1984-85, but were separated out in 1985-86.

Table 7. Harvest summary, WAH Harvest Report System, 1984-85 and 1985-86.

GMU[a]	Harvest		Percent change	Kill/successful hunter		Percent change
	1985	1986		1985	1986	
21D	--	38	--	--	27	--
22	404	1,020	+152	3.9	5.9	+51
23	1,455	2,365	+63	5.8	7.3	+26
24	--	20	--	--	5.0	--
26A[b]	410	320	-22	7.2	7.2	0
Other units[c]	67	35	--	2.2	1.7	--
Total	2,336	3,798	+63	5.3	6.5	+23

[a] Indicates location of vendor that issued the harvest report.

[b] Community of Anaktuvuk included in GMU 26A, although actually within GMU 24 boundaries.

[c] Comparison between 1985 and 1986 not applicable for "Other units." Returned reports from Units 21D and 24 were placed in the "Other units" category in 1984-85, but were separated out in 1985-86.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNITS: 25A, 25B, 25C, 25D, and 26C

HERD: Porcupine

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Porcupine Caribou Herd apparently remained stable at approximately 100,000 animals during the 1960's and early 1970's. Since 1979 the Porcupine Herd has been increasing, and 135,284 caribou were counted during an aerial photocensus in July 1983. No censuses have been completed since then, but herd productivity, recruitment, and mortality have been estimated through studies of radio-collared caribou. The Porcupine Herd appears to have increased at a rate of about 10% per year between 1983 and 1985, which projects to an estimated herd size of approximately 160,000-170,000 caribou in July 1985. Growth was apparently negligible after July 1985.

Population Composition

No composition counts were conducted during this reporting period. Among 3-year-old or older radio-collared females, 38 of 57 (67%) gave birth to calves in June 1985; 9 (24%) of these calves died within 1 month of birth. Nine of 60 (15%) radio-collared neonatal calves died during June 1985. Both sets of calf mortality data suggest that birth rate and early calf survival were slightly lower than in the previous 2 years, but were nevertheless high enough to indicate a healthy and growing population given the apparent level of adult mortality.

Mortality

Calf mortality was monitored by radio tracking 59 newborn calves which were successfully fitted with mortality mode transmitters during the 1st week of June 1985. Twenty-three (39%) died before their 1st birthday, 26 (44%) definitely lived to 1 year of age, and 11 transmitters apparently failed

during winter. First-year mortality could have been as high as 58% if all the calves with apparently failed transmitters died. Most confirmed mortality occurred before October and most transmitter failure occurred after October. Thus, it is likely that actual mortality was closer to 39% than to 58%.

Among radio-collared caribou older than calves, mortality was 31% for adult males (4 of 13), 14% for adult females (8 of 59), and 13% for yearlings (3 of 24). These mortality rates are slightly higher than the rates for the previous 2 years. The Porcupine Herd probably did not increase much over the past year, and may have stabilized in numbers.

Forty-seven people harvested Porcupine Herd caribou in Alaska during the 1985-86 season (figure based on harvest report card returns). In Unit 25, 37 hunters took 50 bulls and 9 cows. In Subunit 26C, 10 hunters harvested 2 bulls and 3 cows. Only 13 hunters took more than 1 Porcupine Herd caribou.

As in past years, harvest by local residents was unreported. Caribou were widely available to villages during July and from October through May. Total subsistence harvest in Alaska was probably 500-700.

Harvest in Canada may have been as high as 4,000 because Porcupine caribou were available near all traditional hunting villages and in the MacKenzie River Delta area.

Management Summary and Recommendations

The Porcupine Herd may have stabilized during 1985-86 due to higher adult mortality and lower calf productivity. Both conditions correlate with harsh winter conditions and extremely late snowmelt in 1986. Census attempts in 1984, 1985, and 1986 failed. Completing a census in 1987 should be a high priority to confirm herd status.

Current seasons and bag limits are adequate to meet sport hunting demands. However, local residents will probably continue to take caribou opportunistically during the closed season, and hunters providing for large or extended families will take more than their individual bag limits. The Porcupine Herd can readily provide for all these uses. Much additional education is necessary before hunting regulations will be acceptable and enforceable for all parties involved.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 26B

HERD: Central Arctic

PERIOD COVERED: 1 July 1985-30 June 1986

Season and Bag Limit

See Hunting Regulations No. 26.

Population Status and Trend

The Central Arctic Herd grew from approximately 5,000 caribou in 1975 to 13,000 (estimated by photocensus) in July 1983. Calf production and yearling recruitment remained high and natural mortality was low during this period, but hunting mortality increased substantially over that of the preceding 4-5 years. The herd is probably still growing, but perhaps at a decreased rate.

Industrial development near Prudhoe Bay and the Trans-Alaska Pipeline continues to affect the local distribution of caribou, but there has been no detectable effect on herd productivity.

Population Composition

Composition counts were conducted in late winter (early May) and at calving time (early June). The May survey covered only a single transect up the Itkillik River from its mouth on the Colville River (coastal plain) to Itkillik Lake (foothills) in the Brooks Range; 33 calves:100 cows were found in a sample of 374 caribou. Such a ratio is probably indicative of moderate recruitment. The calf:cow ratio was lower on the coastal plain (29 calves:100 cows) than in the foothills (37 calves: 100 cows). Adult cows captured during early May were very lean, indicating that winter conditions were harsh. The moderately low calf:cow ratios probably also relate to the winter conditions, as no change in predator numbers was evident. Conditions were apparently most severe near the coast.

The calf:cow ratio measured in the 1st week following the peak of calving in the Kuparuk calving concentration area was only 56 calves:100 cows (n = 891), down considerably from the 70-85

calves:100 cows observed in other years. Lower natality and survival correlated with the poor condition of adult cows, and was probably exacerbated by a very late breakup, with cold temperatures and nearly complete snow cover throughout the calving period. Total numbers of caribou on the Kuparuk calving grounds were also down, as many cows remained farther inland in relatively snow-free areas. Radio-tracking surveys suggest that calving success was also relatively low in these inland areas.

Mortality

Two hundred eighty-three hunters reported harvesting 662 caribou. The number of hunters has been increasing steadily, and the harvest of Central Arctic caribou has nearly doubled each year for the past 3 years. Unsuccessful hunters did not have to report where they hunted, so the total number of hunters using the Central Arctic Herd area is not known.

Most of the increased harvest and hunting activity can be attributed to road-based hunters along the Dalton Highway. Two hundred twenty-two hunters took 574 caribou (396 bulls, 175 cows, and 3 of unknown sex) along the road; 102 (46%) took 3 or more caribou each; and 183 (82%) used some form of off-road vehicle (mostly snow machines). Most hunting occurred during winter. Hunters using aircraft access (n = 61) took only 88 caribou (86 bulls and 2 cows), and only 5 (8%) took 3 or more caribou. One caribou was shot by an aircraft-based hunter in mid-October, and all the remainder of the caribou taken by aircraft access were shot before the end of September. Twenty-nine hunters used bow and arrow to take a total of 46 Central Arctic caribou (all bulls). The four archery hunters who used aircraft took 5 caribou.

Management Summary and Recommendations

Seasons and bag limits in the Central Arctic area have been liberal for the past few years. Regulations were established on the assumptions that the Dalton Highway was open to commercial traffic only, that hunting with firearms within 5 miles of the road was prohibited, and that no off-road vehicles could be used in the road corridor. The liberal seasons and bag limits would then be applicable to the few local residents and to fly-in hunters who would likely not be willing or able to take advantage of the long winter and spring openings or the high bag limits. The road area would be used by a few bow hunters who presumably had road permits for business purposes. Experience has shown that restrictions on use of the Dalton Highway are largely unenforced, and, in some cases, unenforceable. For instance, there is no penalty clause in the legislation prohibiting off-road vehicle use. As a result, the

Central Arctic caribou harvest has become predominantly a road hunt by urban residents. The Central Arctic is the state's only road-connected area having a long season, high bag limit, and large numbers of caribou readily available from the road. Increasing numbers of hunters willing to drive past the numerous "road closed to unauthorized traffic" signs and ignorant or unmindful of the off-road vehicle restrictions have discovered a bonanza in caribou hunting.

Local subsistence harvest of caribou is mostly unreported, but has probably been in the range of 100-200 caribou. Considering that there has also been unreported sport hunting by urban residents along the Dalton Highway, total harvest may have approached 1,000 caribou. The proportion of females in the harvest has been increasing steadily and is now about 25%.

Current harvests are still within the capacity of the herd to withstand, while even continuing to grow slowly. Another doubling of the harvest would likely stabilize the population, however. Part of the management strategy for the Central Arctic Herd is to allow the population to be regulated primarily by natural factors so that potential effects of its interaction with North Slope petroleum development can be examined. Further increases in harvest would obscure these relationships. Therefore, upon recommendation by the Department, the Board of Game reduced to two the number of caribou that can be transported out of Subunit 26B in regulatory year 1986-87. This should reduce the road access-related harvest considerably, even if access remains relatively open. Enforcement of highway restrictions, per se, is beyond the authority of the Department or the Board.

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