ALASKA DEPARTMENT OF FISH AND GAME

JUNEAU, ALASKA

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ANNUAL REPORT OF SURVEY-INVENTORY ACTIVITIES

PART VI. CARIBOU

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Volume XIV

Federal Aid in Wildlife Restoration

Project W-22-2, Job 3.0

(Printed May 1984)

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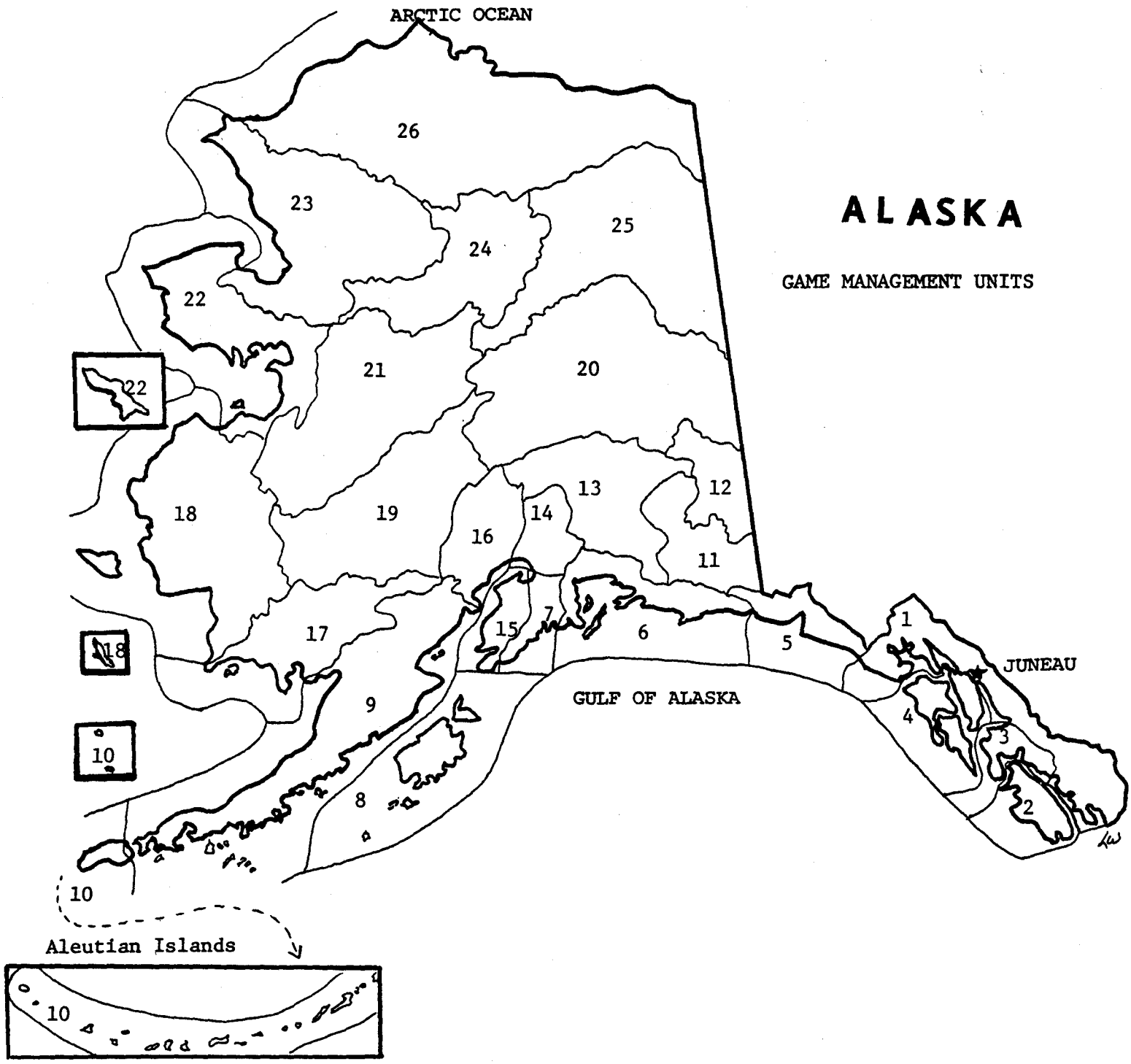
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Statewide Harvest and Population Status

Caribou populations in the State did very well in 1982-83 in general. All large herds (Mulchatna, Northern Alaska Peninsula, Nelchina, Delta, Fortymile, Western Arctic, Porcupine, and Central Arctic Herds) were increasing. Factors included a general mild winter, better controlled human take, and decreased predator pressure (in the case of the Delta and Fortymile Herds). The Statewide population of caribou exceeds 416,000 animals.

The reported harvest in 1982-83 was 4,560 caribou. However, the actual take is probably much higher, due to a widespread lack of reporting, particularly in rural areas.

Population numbers and hunter harvests are summarized as follows:

Herd	Unit Location	Population (est.)	Harvest	
			Rep.	Est.
Kenai Mts.	7	250-300	28	
Mulchatna	9A, 9B, 16, 17, 19B, and 19C	25,416	219	1,330
So. Alaska Peninsula	9D	5,264	410	
No. Alaska Peninsula	9C and 9E	18,000	594	1,200
Adak	10	274	114	
Mentasta	11	2,210	141	
Chisana	12	1,000	21	
Nelchina	13, 14A, and 14B	21,162	861	
Denali	20C	1,200	0	
Kenai Lowlands	15	80	0	
Andreafski	18	200	6	30
Kilbuck Mts.	18	200	2	?
Beaver Mts.	21A		17	25
Sunshine Mts.	19D	575-750	0	10
Rainy Pass	19C	1,500	35	45
Tonzona	19C	1,000	8	
Big River	19C and 19D		27	50
Kuskokwim Mts.	19A	400	0	20
Delta	20A	6,100	273	
Yanert	20A	700		
Macomb	20D	700	40	
Fortymile	20E	12,500	110	165
Western Arctic	22, 23, and 26A	171,699	1,509	?
Porcupine	25 and 26C	137,264	93	600-1,000
Central Arctic	26B	9,000	81	

Robert A. Hinman
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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 7

HERD: Kenai Peninsula Mountains

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The Kenai Mountains Caribou Herd was established through transplants by the Department of Fish and Game from the Nelchina Caribou Herd in 1965 and 1966. Composition surveys conducted since 1977 have indicated the herd is growing in size. Available winter range is limited and will not support a significant population increase. An attempt, therefore, will be to manage this population within its estimated size of 250-300 animals.

Population Composition

There were 266 caribou classified on 27 October 1982, after all known harvest had occurred for the season. The survey was conducted using a helicopter, and counting conditions were considered fair to good. Herd composition was as follows: 51 calves:100 cows, 27 bulls:100 cows, and calves made up 26% of the total caribou observed.

Mortality

There were 28 caribou reported killed during the fall season. Hunter success was 35%; all were taken by Alaska residents. The harvest was comprised of 15 males (56%) and 12 females (44%). Seventeen (61%) of the successful hunters walked into the area they hunted, and the remaining 11 (39%) used horses.

Management Summary and Recommendations

The Board of Game approved a proposal to increase the number of caribou hunting permits from 100 to 150 for the 1982 hunting season. The purpose of this proposal was to increase the harvest to approximately 30 caribou. This level of harvest should stabilize the increasing population trend.

No changes in season or bag limit were recommended.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

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

HERD: Mulchatna

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

A photocensus was conducted 16-17 June 1983 and revealed a total of 25,416 caribou, the highest estimate ever recorded. No estimates were made in 1982; however, 20,618 were counted on 1 July 1981.

The movements of 25 radio-collared caribou were monitored intermittently by Game Division and National Park Service personnel. Several unusual movements were noted. The majority of the herd was located between the Kvichak and Nushagak rivers from Portage Creek northeast to the Koktuli River and Iliamna Lake in November and December 1982. Several small groups were observed crossing the Kvichak River. Several hundred, mostly bulls, were observed in the vicinity of Big Mountain in December and January and were presumably were part of the Mulchatna Herd (R. Sellers, pers. commun.). Nushagak River villagers reported seeing a dramatic increase in caribou near New Stuyahok and Ekwok and on the west side of the Nushagak River from November 1982 through March 1983.

Population Composition

A sex and age composition count was conducted 16-17 June 1983. Two major portions of the herd were sampled, one in the Mosquito Creek drainage (approximately 5,500 caribou) and another in the Caribou Lakes area (approximately 12,000 caribou). A smaller aggregation (approximately 3,500 caribou) was found in the Bonanza Hills. It was apparent during the photocensus that most of the males were still with large aggregations. A much larger percentage of males was found in the Mosquito Creek drainage than in the Caribou Lakes area, and results were weighted accordingly. There were 1,926 caribou counted and classified as follows: 44.5 males:100 females, 49.7 calves:100 females, 22.9% males in the herd, 51.2% females in the herd, and 25.9% calves in the herd. Although the percentage yearlings was not recorded during the composition counts, it appeared to be high. Data indicated that the Mulchatna Herd increased in size.

Mortality

Harvest data compiled from reports returned by hunters are of questionable value since the reported harvest was a minor fraction of the estimated actual harvest. During regulatory year 1982-83, 328 hunters reported taking 311 caribou. Of those that were successful, 149 were residents, 77 were nonresidents, and 32 were of unknown residency. Males composed 76.8% of the kill (N = 236).

The Statewide return of caribou harvest reports was only 42% of those issued. Presented in Table 1 is a comparison between reported harvest and estimated harvest by village. Estimates are based on informal interviews with villagers and on data collected in New Stuyahok and Nondalton by the Subsistence Division.

Management Summary and Recommendations

Radio telemetry is a highly effective tool for determining locations of postcalving aggregations prior to making photocensus estimates of herd size. Radios with a theoretical lifespan of 48 months were attached in March 1981 and, to date, have functioned for 30 months. Ten additional radios should be placed on animals randomly distributed in the herd.

Increases in size of the Mulchatna Herd have been noted each spring since 1980 in spite of increasingly liberal hunting seasons. Historically, late winter seasons generated high levels of hunting pressure from residents of Anchorage and Kenai when it was legal to hunt the same day as airborne. Hunting pressure in the spring has not been excessive since the mid-1970's when this restriction went into effect. While a higher level of harvest may be desirable at this time, attempts to increase harvest levels should be made through dissemination of information advertising the availability of caribou rather than further liberalization of regulations.

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Table 1. A comparison between the reported and estimated Mulchatna caribou harvest, 1982-83.

Village	Reported harvest	Estimated harvest
Dillingham	12	40
Aleknagik	0	35
Portage Creek	0	30
Ekwok	0	40
Manokotak	1	30
New Stuyahok	1	300
Koliganek	0	60
Iliamna	5	60
Nondalton	1	100
Igiugug	0	30
Kokonak	1	25
Port Alsworth	3	30
Kenai Peninsula	31	100
Anchorage area	66	200
Other in Alaska	21	100
Nonresidents	77	150
Total kill	219	1,330

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9C and 9E

HERD: Northern Alaska Peninsula

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The caribou ranging north of Port Moller have been monitored by radio telemetry for the past 3 summers and have demonstrated separate calving and winter areas from those ranging south of Port Moller. Designation of Northern and Southern Alaska Peninsula Herds is, therefore, justified. An aerial photocensus in June 1983 revealed a minimum population estimate of 18,000 caribou. Census techniques and effort were similar to 1981 and 1982 when the minimum population estimates were 16,600 and 16,800, respectively (Table 1). Considering the decrease in reported harvest, a mild winter, and good calf production, it appears this herd has grown slightly over the past 2 years.

Population Composition

Calf production and survival continued to be high. The fall ratio of 43 bulls:100 cows was within the range observed over the past several years. Presented in Table 1 is a historical summary of caribou composition data.

Mortality

The reported harvest for the Northern Alaska Peninsula Herd was 594 caribou; 74% were bulls. This harvest was 14% lower than the 1981-82 level. The fall harvest (10 Aug-21 Oct) decreased 33% while the winter harvest increased slightly over last year. The major reason for the decline in fall harvest was a 43% decrease in the number of nonresident caribou hunters. Efforts have been made to increase reporting compliance by local residents, but only 28 residents of Subunit 9E reported taking caribou in 1982-83. The unreported take is estimated to approximate the reported take. Consequently, the total 1982-83 caribou harvest was estimated at 1,000-1,200.

Management Summary and Recommendations

Following the 1982 photocensus, it was believed that the herd had stabilized. However, a decrease in harvest in 1982-83 and good calf production have resulted in a slight increase in herd size.

The herd is now at the upper limit prescribed by the Alaska Peninsula Caribou Management Plan, and further growth is not desired. If the herd continues to grow, liberalization of the hunting season may be recommended.

Literature Cited

Alaska Dep. Fish and Game. 1976. Southwestern Alaska Peninsula caribou management plan. Pages 94-96 in Alaska Wildlife Management Plans Draft Proposal. Fed. Aid in Wildl. Rest. Proj. W-17-R. Juneau.

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Table 1. Summary of available population statistics for the Northern Alaskan Peninsula Caribou Herd, 1970, 1975-76, 1978, and 1980-83.

Year	Season	Bulls/ 100 cows	Calves/ 100 cows	% calf in herd	Pop. est.
1970	Fall	48.3	46.1	22.9	--
1975	Fall	33.0	44.6	25.1	10,340[a]
1976	Spring	--	--	--	11,368[b]
1978	Fall	48.3	55.2	25.0	--
1980	Fall	52.8	56.5	27.0	--
1981	Spring	--	--	27.8	16,600[b]
1981	Fall	33.6	39.2	22.7	--
1982	Spring	52.2	55.4	26.7	16,800[b]
1982	Fall	43.1	51.6	26.5	--
1983	Spring	--	--	28.5	18,000[b]

[a] Aerial photo-direct count extrapolation; total herd.

[b] Spring aerial photo without extrapolation.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 9D

HERD: Southern Alaska Peninsula

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The seasonal movements of Alaska Peninsula caribou have been monitored during the past 3 years and show no exchange of animals between the Northern and Southern Herd segments. Thus, separate designation of the herd south of Port Moller, as the Southern Alaska Peninsula Herd, is warranted.

Staff of the Izembek National Wildlife Refuge counted 5,138 caribou in mid-July 1982, and 5,639 caribou in mid-January 1983 (C. Dau, pers. commun.). A photocensus in June 1983 tallied 5,264 caribou (C. Dau, pers. commun.). Despite a large increase in harvest from 1978 through 1981 and relatively low productivity, this herd remained within the desired population size of 5,000-6,000 caribou.

Population Composition

Personnel from the Izembek Refuge completed a ground composition count (November) of 1,527 caribou and determined that calves composed 13% of the herd. Interpretation of aerial photos taken during the June 1983 photocensus revealed an average of 18% calves. In recent years, the herd had significantly lower calf production than the Northern Alaska Peninsula Herd.

Mortality

The reported harvest was 410 caribou; 73% were bulls. Over 90% of the harvest occurred after 31 October. This was the 1st season since 1978 in which the harvest did not increase significantly. A 50% drop in the fall harvest more than offset a slight increase in the winter harvest.

Management Summary and Recommendations

Winter surveys have been conducted during the past several years, and more caribou have been counted than during the postcalving photocensus. It is unlikely that mortality between mid-January

1983 and June 1983 could account for an estimated loss of 1,300 adults and short yearlings that were not present during the photocensus. Thus, some parts of the herds were probably missed during the photocensus. Nevertheless, the herd has remained at a desirable level, and the dramatic rise in harvest did not continue through the past season. If the population continues to number over 5,000 and reported harvest remains at less than half the estimated calf production, there should be no immediate need to change hunting regulations.

To facilitate monitoring of the harvest, it is recommended that the keypunching of harvest data be modified to reflect the identity of the Southern and Northern Alaska Peninsula Herds.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 10

HERD: Adak Island

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

U.S. Fish and Wildlife Service (USFWS) personnel observed 274 caribou on Adak Island during a helicopter survey conducted 14 September 1982. Approximately 33 caribou had been harvested prior to the survey. That survey, when compared to surveys completed between 1 July 1976-30 June 1981 (Sexton and Taylor 1981), indicated that the population had stabilized.

Population Composition

No data were available.

Mortality

The reported harvest was 114 caribou, including 50 males, 58 females, and 6 sex unknown. The hunt was closed by emergency order on 14 December 1982. Since Adak Island received over 100 inches of snow during this report period, it was possible that some natural mortality had also occurred.

Management Summary and Recommendations

The annual increment in herd size is approaching the annual harvest. Approximately 200 caribou were present on Adak following the 1982-83 season. This number is acceptable when compared to the precalving level of 150 caribou recommended in the Adak Island Caribou Management Plan (adopted November 1980).

Since the Adak Caribou Herd appears to have been reduced to a precalving population of approximately 200 animals, adjustments in seasons and bag limits are warranted. For this reason, the USFWS, local Adak sportsman groups, and the Department recommended the season be shortened from 1 July-30 June to 1 September-31 March and the bag limit decreased from 4 to 2 caribou. In addition, a registration permit hunt was recommended to maintain accurate harvest information and effective caribou management.

Literature Cited

Sexton, J. J., and W. P. Taylor. 1981. Adak Island Caribou Herd survey-inventory progress report. Pages 17-19 in R. A. Hinman, ed. Annual Report of Survey-Inventory Activities. Part II. Caribou, Moose, and Mountain goats. Vol. XII. Alaska Dep. Fish and Game. Fed. Aid in Wildl. Rest. Prog. Rep. Proj. W-19-1 and W-19-2, Job 3.0, 1.0, and 12.0. Juneau.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 11

HERD: Mentasta

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The population estimate for the Mentasta Caribou Herd was 2,210, a moderate decrease from the 2,819 reported last year.

Population Composition

Ratios of 36 bulls:100 cows and 39 calves:100 cows were calculated from composition data collected on 13 October 1982. Survival to 11 months of age was not estimated as the Mentasta and Nelchina Caribou Herds were mixed on their late winter-early spring range. Weather conditions were mild throughout most of the winter, and weather-related mortality was probably minimal.

Mortality

Hunters killed 141 caribou, including 95 bulls, 39 cows, and 7 of unidentified sex. This mortality compares with 135 caribou killed the previous year. Of the 215 permittees who reported hunting, 66% were successful.

Of the successful hunters, 99 used aircraft, 20 used off-road vehicles, 18 hunted by highway vehicle or afoot, 2 used horses, 1 used a boat, and 1 did not report transportation means. This breakdown of transport means was similar to that seen over the past 3 years.

Management Summary and Recommendations

The Mentasta Caribou Herd appears stable. Fluctuations in population estimates over recent years probably reflect variations in survey conditions, rather than actual change in herd size.

Large segments of both the Mentasta and Nelchina Herds made extended movements across the Mentasta Mountains into the Nabesna-Chisana region this past winter. Extensive monitoring of movements of radio-collared animals suggested that both caribou herds returned to their respective ranges.

No changes in season dates or number of permits issued were recommended.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 12

HERD: Chisana

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The Chisana Caribou Herd contains approximately 1,000 caribou and apparently is stable or slowly increasing. Available range encompasses 900 to 1,000 mi^2, so a herd in excess of 2,000 caribou may be undesirable. Increased wolf harvests in the Chisana and White River drainages may have reduced overall mortality on the herd during the past 2 years.

Population Composition

A fall sex and age composition survey of the Chisana Herd was conducted 13-14 October 1982, and 409 caribou were classified. The sample contained 13% calves, 23% bulls, and 64% cows. The calf:cow and bull:cow ratios were 21:100 and 36:100, respectively. Herd composition has varied little during recent years.

A postcalving survey of herd composition was conducted on 21 June 1983, and 263 caribou were classified. Calves composed 16% of the sample, compared to 15.5% in June 1981. When the abundance of predators is relatively low, many Alaskan caribou herds contain 25% or more calves in late June and calves often compose 30-40% of postcalving aggregations because bulls are often not present.

Mortality

Predation by wolves, grizzly bears, and other smaller predators such as golden eagles, coyotes, and lynx appears to be the primary mortality factor affecting the Chisana Herd.

Hunters reported taking 21 bull caribou in 1982, compared to 24 in 1981. From 1974 through 1978, prior to the bulls-only restriction, annual harvests averaged 47 caribou. After the bulls-only restriction was imposed, annual harvests have averaged 21 bull caribou (approximately 2% of the Chisana Herd).

Management Summary and Recommendations

The Chisana Caribou Herd is apparently stable or is slowly increasing. If substantial wolf harvests in the herd's range result in increased rates of calf survival, a reinstitution of limited cow harvests should be considered, unless herd growth becomes the primary management objective. Priorities for 1983-84 should include a rigorous census of the herd and continued herd composition sampling.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 13 and 14 (except 14C)

HERD: Nelchina

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The estimated fall population for the Nelchina Caribou Herd was 21,162, up slightly from 20,694 animals estimated the previous year.

Population Composition

A postcalving survey was conducted on 8 July, and a calf:cow ratio of 55:100 and a bull:cow ratio of 57:100 was observed. On 6 October, a 2nd survey was completed and a calf:cow ratio of 54:100 was observed. Overwinter survival of calves (age 11 months) was high as reflected in the 11 April 1983 count of 41 calves:100 cows. This count was nearly identical to 42 calves: 100 cows observed the previous April.

Mortality

During the hunting season, 1,750 permittees killed 861 caribou, 702 males, 111 females, and 48 sex unknown. This was a slight decline from the previous year's harvest of 901. A summary of harvest data are presented in Table 1.

Transport methods used by successful sport hunters indicated off-road vehicles exceeded aircraft use for the 1st time. The most popular method of transport used by subsistence hunters was highway vehicles followed by snowmachine, off-road vehicles, and aircraft.

Management Summary and Recommendations

Population estimates for the Nelchina Caribou Herd suggest continued herd expansion. The calf:cow ratio was the highest observed for the Nelchina in 10 years (Pitcher 1983). The harvest was similar to the previous year in spite of an increase in the number of hunting permits issued.

No changes in season or bag limits were recommended; however, the number of permits issued should be increased so that the herd is stabilized near its present size.

Literature Cited

Pitcher, K. W. 1983. Big game studies. Vol. IV. Caribou. Final Phase I. Rep. Susitna Hydroelectric Proj. Alaska Dep. Fish and Game. Juneau. 101pp.

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Table 1. Nelchina Caribou Herd harvest summary, 1982-83.

Hunt No.	Permits issued	Total harvest	No. hunters	% success	% Males in harvest	(N)
503	1,300	652	973	67	84.7	(524)
503W[a]	233	104	173	60	90.5	(86)
503W[b]	217	105	188	56	92.0	(92)
503W Total	450	209	361	58	91.2	(178)
Totals	1,750	861	1,334	65	86.3	(702)

[a] Drawing hunt.
[b] Registration hunt.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 13E and 20C

HERD: Denali

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

Based on the number of caribou observed (535) and the proportion of calves present during National Park Service surveys of post-calving aggregations, the herd has declined from the previous year, and consists of 900-1,200 animals (NPS estimate).

Population Composition

Nine aerial surveys were conducted by NPS personnel between 27 May and 9 July. The largest sample (535) was obtained on 15-16 June, indicating a ratio of 19:100 of calf/females older than 12 months. Initial calf production could not be determined, but reproduction is thought to have been even lower than in 1982 when postcalving surveys revealed 21 calves:100 females older than 12 months.

Mortality

Data regarding mortality of this herd were not collected. Wolf densities of 1 wolf/30-50 mi^2 probably exist within the original McKinley National Park boundary. The status of the wolf population within recent extensions of the park is unknown, but additions on the north and west probably encompass ranges of additional wolf packs. Wolf and grizzly bear predation is probably high enough to impede growth of caribou numbers within the park.

Management Summary and Recommendations

The population estimate for the Denali Herd has remained at a low level for the past 11 years, despite restrictive or closed hunting seasons. Recent studies have shown that the herd's range/energetic status is high. Predation resulting in poor calf survival is suspected of impeding growth of the herd.

Although the number of caribou inhabiting the park is sufficient to meet the nonconsumptive Park Service goals, a larger herd may more adequately satisfy the subsistence needs of those communities that qualify to hunt within the Park (Cantwell, Nikolai, Telida, and Minchumina).

Mining activity associated with the Kantishna Hills and Dunkle Mine areas has necessitated the preparation of a draft environmental impact statement. The 2 mining areas are within or adjacent to calving grounds used by the Denali Caribou Herd, and the Division of Game has reviewed the environmental impact statements to evaluate the consequences of 6 alternatives discussed with respect to caribou (L. Jennings, pers. commun.). Jennings summarized the Division's concern as follows: "The amount of habitat projected to be lost or disturbed by both the Kantishna and Dunkle Mines is insignificant.... However, there is legitimate concern for long-term effects of development on accessibility or usability of key seasonal ranges." The Division has recommended alternative #2 (Federal government acquisition of all patented and valid unpatented mining claims) or alternative #1 (allow mining operations to continue) in the Dunkle Mine area. There were no recommendations regarding preferred alternatives in the Kantishna Hills.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 15

HERD: Kenai Peninsula Lowlands

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The Kenai Lowlands Caribou Herd was established through transplants by the Department of Fish and Game from the Nelchina Herd in 1965 and 1966. The herd currently numbers about 80 animals and ranges over portions of Subunits 15A and 15B. Population growth since the mid-1970's has been slow. Predation of young calves (less than 30 days old) by domestic dogs and wild carnivores is strongly suspected of limiting population growth.

Population Composition

A composition survey was conducted on 25 October, and 65 caribou were observed. The calf:cow and bull:cow ratios were 49:100 and 37:100, respectively. Calves made up 26% of the total animals observed. The number of calves observed (17) represents an 85% survival rate when compared to the number of calves (20) found on 15 June 1982. A composition survey was also conducted on 7 June, and 71 caribou were observed. The calf:cow and bull:cow ratio was 47:100 and 39:100, respectively. Calves represented 25% of the total animals observed. Eleven of 53 adults classified were yearlings indicating moderately high overwinter survival.

Mortality

No data were available.

Management Summary and Recommendations

Low recruitment was the primary management concern of this herd prior to 1978. High recruitment during 1982 and 1983 may have reversed this trend. Additionally, the number of animals observed has increased steadily from 1978 when less than 40 animals were counted.

The Department recommended opening the caribou season to sport hunting by drawing permit for fall 1983. Four permits for bulls

only were proposed. It was believed that this highly visible wildlife resource could be shared with the hunting and nonhunting public with no detriment to the population. However, the U.S. Fish and Wildlife Service opposed the proposal and the Board of Game denied the request.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 18

HERD: Andreafsky Mountain and Kilbuck Mountain

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

Little information is available concerning the status of the Andreafsky and Kilbuck Mountain Caribou Herds. Observations by Department personnel and local residents indicate that each herd probably numbers less than 200 animals. Although information is scanty, we believe the Andreafsky Herd is probably declining due to excessive hunting pressure from local residents.

Population Composition

On 1 April 1983, an aerial survey was conducted near Needle Mountain in the upper Andreafsky and Chuilnak drainages. Although no caribou were found, tracks suggested that fewer caribou were in the area than in the previous year. Snowmachine tracks indicated that hunting pressure was very heavy, and most of the caribou appeared to have moved to the east into the relatively inaccessible, rugged portions of the upper Chuilnak and Anvik drainages. No surveys were conducted specifically for the purpose of assessing the status of the Kilbuck Mountain Herd.

Mortality

Because compliance with the harvest ticket requirement is poor, we are not able to accurately estimate the harvest of the Andreafsky Herd. The known harvest was 6 caribou during this reporting period. We believe the actual harvest was at least 5 to 6 times greater than the reported harvest. Several local residents who hunt the herd every year believe hunting pressure was unusually great compared with previous years, because weather and snow conditions were perfect for hunting by snowmachine.

Compliance with the harvest ticket requirement is also poor for the Kilbuck Herd. Only 2 caribou were reported harvested by hunters. Although the weather conditions during late winter and spring were excellent, the area received relatively little snow, and traveling conditions for snowmachines were poor. Consequently, we believe hunting pressure was lighter than the previous year.

Management Summary and Recommendations

The ranges of both herds border a number of villages with little or infrequent access to red meat. Consequently, hunting pressure on both herds is substantial during late winter and spring. Due to the remoteness of both herds, noncompliance with seasons and bag limits is a serious problem. Most hunters do not consider a 1-caribou bag limit realistic considering the distance hunters must travel from their village. The problem is further aggravated by confusion caused by the 5-caribou harvest ticket format currently in use. The problem is particularly serious with the Andreasfsky Herd which is found in Subunit 22A as well as Unit 18. Subunit 22A currently has a bag limit of 5 caribou and an 1 August-30 April season. Although the bulk of the herd is normally found within Unit 18 during the winter, hunters often apply Subunit 22A seasons and bag limits to this herd for convenience. Consequently, we believe many hunters harvest more than 1 caribou when the opportunity arises.

Another problem related to the Andreafsky Herd is its proximity to domestic reindeer owned by herders in St.Michael and Stebbins. Because "caribou" of the Andreafsky Herd are probably derived from wild reindeer, there is little to differentiate them from domestic reindeer. Consequently, we occasionally receive reports from herders and hunters that domestic reindeer are mistakenly shot as wild reindeer or caribou.

Increased survey and enforcement activities are recommended in the ranges of both herds. The season for the Andreafsky Herd should be shortened to conform with the Kilbuck season (1-28 Feb) because of increased hunting pressure. No changes in seasons or bag limits are recommended for the Kilbuck Herd at this time.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 19 and 21

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

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Herd Movement and Identity

Most of the caribou in Subunits 19A (south of the Kuskokwim River) and 19B are part of the Mulchatna Caribou Herd which is reported elsewhere. Data from radio-collared caribou and sightings of caribou indicate several small, distinct herds in Units 19 and 21. These include the Beaver Mountains and Sunshine Mountain Herds in Subunits 21A and 19D, the Rainy Pass and Tonzona Herds in Subunit 19C, the Big River Herd (often referred to as the Farewell Herd) in Subunits 19C and 19D, and several small groups (usually containing less than 150 caribou each) in the Kuskokwim Mountains in Subunit 19A north of the Kuskokwim River.

In April 1982, radio collars were placed on 6 cows of the Beaver Mountains Herd, 5 cows of the Sunshine Mountain Herd, and 9 cows of the Big River Herd. Because the radio-collared caribou have provided the opportunity to determine the distinctness of these 3 caribou groups, their movement patterns since collaring are included here.

In April 1982, a large group of caribou was located on the northwest side of the Beaver Mountains along drainages of Windy Creek; 6 cows were radio-collared there. Observations during 1982-83 indicate that the herd arrived in the Windy Creek drainages in early February and remained until early May. On 6 May, a narrow band of caribou on the west side of the Beaver Mountains was moving south from Windy Creek to the southern end of the Beaver Mountains. At least 2 cows near the rear of the group were accompanied by calves. By late May, the Beaver Mountains Herd had divided into 2 large groups near the middle of the area where they had been strung out in early May, and calves were numerous. In mid-June, the herd was located within a 2-mi wide band stretching along the divide between Moose and Fourth of July Creeks. At the end of June 1982, nearly all of the Beaver Mountains caribou were in a large group near the southeast end of the Beaver Mountains. In August and September, most of the caribou were located along the northwest end of the Beaver Mountains. By

late October, they had moved to the lower Iditarod drainage where they remained through January and after which they returned to the foothills of Windy Creek.

Behavioral traits of the Beaver Mountains Caribou Herd contrast sharply with those of the Sunshine Mountain and Big River Caribou Herds. The Beaver Mountains Herd is probably a remnant of the old reindeer herd located in the area during the 1930's. Traits typical of reindeer that are exhibited by the Beaver Mountains Herd are calving 2-3 weeks earlier than caribou in adjacent areas and the reduced dispersal throughout the year.

Based on a survey in June 1983, the Sunshine Herd is thought to number from 525-750 caribou. In late April 1982, 5 cows were captured and radio-collared on the northwest side of Sunshine Mountain near the headwaters of the Nowitna River. Observations during regulatory year 1982-83 indicated that the Sunshine Mountain Herd remains together for a short period in late winter and then disperses widely from the Nixon Fork flats to the headwaters of the Susulatna River during calving in late May. By mid-June, most of the caribou occupied the black spruce bogs where they had calved, to areas above timberline on Cloudy, Cripple, and Sunshine Mountains. A few widely scattered singles and small groups remained in the heavy black spruce. By late summer, groups had mostly split up into groups of 10 or less and were in heavy timber from the Upper Nowitna and Susulatna Rivers to Ivy Creek on the Nixon Fork. By late October and through most of the early winter, the herd was scattered from the Nixon Fork flats to near the Nowitna River. By early February, most caribou had moved from the Nixon flats to the foothills between the Nowitna and Susulatna Rivers where they remained until early April. They then started a slow movement to the north side of Sunshine Mountain.

The Sunshine Mountain Herd is characterized by small, widely scattered groups that remain in dense black spruce habitat throughout much of the year except for a short period in early April and again during part of June and July.

Nine cows from the Big River or Farewell Herd were radio-collared near Farewell in April 1982 to help determine herd movements. Farewell is located at timberline on the north side of the Alaska Range, and caribou start appearing in the vicinity as early as February in some years. In 1983, however, most of the herd arrived in April. In early May, the Big River Caribou Herd moved as a group to the west, along the foothills, until near the Big River where they separated into several small, widely scattered groups. They then dispersed into all habitat types from dense black spruce forest to the tops of high mountain ridges. During mid- to late-May, nearly half of the radio-collared caribou calved in the black spruce forest extending from the Big River to the Selatna River. By the end of May, most had moved out of the forest to the foothills of the Alaska Range mainly east of the Big River where they remained until October. One group of about

200 was in the Lyman Hills west of White Mountain Mine. The herd wintered near McGrath along the lower Big River.

Caribou from the Big River Herd have often been considered part of the Mulchatna or Rainy Pass Herds; however, based on movements observed during 1982-83, it appears to be a discrete herd. Why the Big River and Sunshine Mountain Herds tend to move to alpine tundra areas just prior to calving and then disperse widely into timbered areas before forming large postcalving groups above treeline is not fully understood. This movement pattern probably contributes to the continued lack of growth of the herds.

Several groups, each consisting of less than 200 caribou, reside north of the Kuskokwim River and apparently represent distinct Kuskokwim Mountains Herd(s). They can be found near Horn and Russian Mountains, Crooked Creek drainage, and the Granite Mountain-east fork of George River area. In contrast, south of the Kuskokwim River, small distinct groups do not exist. Caribou that do occur south of the Kuskokwim in the Aniak and Holitna drainages and in the Taylor Mountains are part of the Mulchatna Herd.

The Rainy Pass Herd contains approximately 1,500 caribou and remains in the Alaska Range, mostly on drainages of the South Fork of the Kuskokwim and Happy Rivers. Rainy Pass caribou may move as far north as near Farewell in early winter but then leave this area before the Big River Herd moves into the Farewell area during the period February-April.

The Tonzona Herd contains less than 1,000 caribou that can usually be found on the upper drainages of the Tonzona River to near Purkeypile Mine in the summer and fall and as far north as the Slow Fork hills in the winter. This group originally may have been part of the Denali Herd, but now seems to maintain its separate identity.

Mortality

The reported harvest of the Beaver Mountains Herd was 15 bulls and 2 cows, but it is likely that the actual harvest was about 25 caribou. All 28 hunters who reported used aircraft to get to the hunting areas. During the hunting season, the herd is usually located along the east and north sides of the Beaver Mountains.

There were no caribou reportedly taken from the Sunshine Mountain Herd. During the hunting season, Sunshine Mountain caribou were almost entirely inaccessible. During the winter, most of the herd is located in the Nixon Fork flats; approximately 10 caribou were likely taken illegally in that area.

Twenty-two males, 4 females, and 1 caribou of unspecified sex were reported taken from the Big River Herd by 31 hunters. Since Big River caribou are located along the Alaska Range foothills during the fall season and in the flats near McGrath and Nikolai

during winter, the herd can be subjected to considerable hunting pressure. The actual harvest likely approached 50 caribou, with most of the unreported harvest being taken in the flats near Nikolai.

The South Fork of the Kuskokwim River is a popular hunting area, and 31 bulls and 4 cows were reported taken there. The actual harvest of the Rainy Pass Herd was probably near 45 caribou. All hunters used aircraft to reach the hunting area. The number of hunters this year and last was identical (40), but the harvest increased from the 19 reported last year. Hunting success varies considerably in this area as the herd tends to disperse widely during the hunting season.

Eight bulls were reported taken from the Tonzona Herd which was probably close to the actual harvest. The only access to these animals is by aircraft.

No caribou have been reported taken from the Kuskokwim Mountain Herd(s) the last 2 years. However, 15 to 20 caribou were likely taken, mainly from the Horn Mountains and on Cripple Creek near the mining areas on upper Cripple Creek.

Most caribou taken in Unit 19 are part of the Mulchatna Herd and are reported elsewhere.

Management Summary and Recommendations

Following radio-collared caribou can help determine the existence of small discrete herds formerly considered part of much larger herds. Caribou in Unit 19 appear to exist in several small distinct herds that should be managed individually. Based on data obtained to date, the Big River Herd should be carefully monitored because it is subjected to hunting by recreational hunters in fall and subsistence-oriented hunters in winter. Efforts should continue to delineate ranges and seasonal movements of herds in Unit 19 to develop appropriate hunting seasons and bag limits for each.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20A and parts of 20C

HERD: Delta

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

Natural mortality in the Delta Herd has been low since wolf control commenced in 1976, and the herd is increasing by about 20% annually. According to estimates based on a combination of a photocensus and visual counts, the Delta Caribou Herd contained a minimum of 6,100 caribou in June 1982. This represents a minimum known population because a significant number of calves were not discernible on the photographs and therefore were not included in the census results. Approximately 700 additional caribou, located in the Yanert River drainage, are believed to be a separate group from the Delta Herd, exhibiting the characteristics required for herd designation.

Population Composition

During sex and age composition counts conducted on 8 October 1982, 29 calves/100 cows (calves composed 19% of the sample) and 54 bulls/100 cows (bulls composed 30% of the sample) were classified (N = 1,349). Both ratios are down from 1981 figures, which were 41 and 59, respectively. The 1982 calf:cow ratio is lower than during any other year since 1976. On 26 November, 1982, 342 caribou in the foothills south of the Japan Hills were classified, revealing ratios of 38 calves:100 cows and 60 bulls: 100 cows. Which set of composition data most accurately reflects true herd composition is unknown. Traditionally, it has been assumed that composition data collected during the rut (October) accurately reflect true herd composition, but recent study has shown that biased results can occur even during the rut.

Composition counts made on 20 April 1983 revealed 29 short yearlings/100 cows (short yearlings composed 19% of the herd), indicating excellent overwinter survival of the 1982 calf cohort.

Initial production data, gathered from the calving grounds on 21 May following the calving peak, showed 80 calves:100 cows, which is about normal. By 15 June, the calf:cow ratio had dropped to 51:100, and calves composed 33% of the sample obtained from postcalving aggregations (i.e., bulls and yearlings underrepresented). Because yearlings were not separated from adults

during the June classification data, the calf:cow ratio was probably higher than the figures indicate. In addition, considerable difficulty was experienced in determining the sex of adult animals. If young bulls were erroneously classified as cows, then the calf:cow ratio would have been further underestimated.

The mean age of a sample of 50 female caribou taken primarily during the winter registration hunt was 7.1 years (SD = 4.4). Though the sample was small, bias introduced from hunter selection of female caribou is minimal, so the sample should generally reflect the population age structure. In contrast, hunter selection of males creates so much bias that small samples rarely reflect the population's age structure.

Mortality

The reported harvest from the drawing permit season, for which 175 permits were issued, was 104 caribou (92 males, 11 females, and 1 caribou of unknown sex).

During the registration permit season, 1,538 permits were issued and 169 caribou (101 males, 65 females, and 3 caribou of unknown sex) were killed. The harvest quota of 500 caribou established by the Board of Game was not achieved. Hunter reports indicated that 92% of the drawing permit season harvest occurred west of (and including) the Wood River drainage, while the same area produced 93% of the registration permit season's harvest.

During the drawing permit season, aircraft users took the most caribou (49% of the harvest), while those using snowmachines for transportation predominated during the registration season (54% of the harvest).

During the 1982-83 drawing permit season, 1,011 permit applications were received and 175 issued. Successful hunters numbered 104, compared to 18 unsuccessful. Forty permit holders did not hunt, and 13 successful applicants did not report whether they hunted or not.

Areas of reported harvest in the drawing permit season were as follows: Delta Creek (2), Delta River (2), Little Delta River (16), Dry Creek (11), Wood River (9), Gold King-Foothills (14), Tatlanika (6), Totatlanika (10), Ferry-Healy (24), Yanert (8), and area unknown (2).

Transportation means reported by successful hunters during the drawing permit were as follows: aircraft (50), horse (16), motorbike (2), off-road vehicle (22), highway vehicle (12), dog team (0), snowmachine (0), and unknown (2).

The registration permit hunt of the 1982-83 season involved 1,538 applications and 1,538 permits issued. Successful hunters numbered 169, compared to at least 852 unsuccessful hunters and those who did not hunt. Registration permit holders who did not report numbered 517.

During the 1982-83 registration permit hunt, reported harvest by drainage or area was as follows: Delta Creek (0), Delta River (0), Little Delta River (7), Dry Creek (5), Wood River (13), Gold King-Foothills (34), Tatlanika (7), Totalanika (45), Ferry-Healy (41), Yanert (14), and area unknown (3).

Seventy-six successful hunters used snowmachines as their means of transportation during the 1982-83 registration hunt. Other transport modes were as follows: aircraft (51), dog team (13), horse (0), motorbike (2), off-road vehicle (9), highway vehicle (3), and means unknown (15).

Twenty-eight caribou, including 7 in the Yanert drainage, were equipped with radio collars during the reporting period. One mortality was recorded among the collared caribou, but the cause of death was undetermined.

No Department wolf control occurred in the range of the Delta Caribou Herd during 1982-83, but permits for aerial wolf hunting were available to the public.

Management Summary and Recommendations

The Delta Caribou Herd exceeds the tentative optimum population goal of 5,000-6,000 adults established in 1983. Survival of all cohorts has been very good, and the herd has been growing by about 20% annually. Further herd growth should be curtailed by imposing minimal hunter restrictions and continuing long seasons. Pending the outcome of the 1983-84 harvest, consideration should be given to regulations needed to stabilize the herd at about 5,000-6,000 animals. Wolf control efforts aimed at benefiting the Delta Caribou Herd should be suspended again in 1983-84. Population monitoring should continue.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20D

HERD: Macomb

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

Based on a count of about 500 caribou during an October 1981 survey, the Macomb Caribou Herd was estimated to number approximately 700 caribou in 1983. Although the herd was not censused during the past 2 years, other information collected during 1982 and 1983 suggests that the herd is stable or slowly decreasing.

Population Composition

Age and sex composition of the Macomb Herd was assessed by using a helicopter and ground composition counts on 14 October 1982. During the survey, 218 caribou were classified. The survey revealed 21 bulls/100 cows, 13 yearlings/100 cows, and 27 calves/100 cows. Bull data may be biased because of postrut segregation of sex and age cohorts. Otherwise, the survey is thought to accurately represent herd composition.

Calves were relatively scarce in the herd during spring 1983. Among 135 caribou observed during a calving survey on 31 May 1983, there were 16 calves/100 cows.

Mortality

A total of 254 applications were received for the 140 permits available for hunting the Macomb Herd. More than half (83) of the permittees hunted, and they harvested 40 caribou. Successful hunters spent about half the number of days afield as reported by successful hunters in 1981. This may be an indication that bulls were more available in 1982 than during the previous season.

Most successful hunters (60%) walked from the road system. A substantial portion (25%) of the successful hunters used horses, and very few (5%) flew to the hunting area. Motorized vehicles are prohibited within the Macomb Controlled Use Area portion of the herd's range, except that fixed-wing aircraft may be used to transport hunters to Fish Lake. Most (83%) of the caribou harvested were from the controlled use area. Three caribou were reported taken in the Little Gerstle and Jarvis Creek drainages.

During 1982-83, 61% of the total harvest occurred in September, compared to 45% in 1981 and only 8% in 1980. Mild September weather in 1982 may partially explain the pattern.

The rate of natural mortality is largely unknown, but the apparent low calf numbers observed during the 27 May 1983 survey suggest that mortality of newborn calves was high. Weather conditions were monitored at Dry Creek at the base of the Macomb Plateau from 17 May through 25 May. Snow or rain was recorded on 2 days, temperatures below freezing were recorded on 4 days, and medium velocity winds were recorded on 2 days. These weather conditions may have contributed to the apparent calf mortality, but significant predation by wolves, bears, and eagles could have been responsible for calf losses.

Distribution and Movements

Seven cow caribou, radio-collared in October 1982, were relocated 3 times during the reporting period. Caribou that were collared west of Johnson River returned to the main portion of the Macomb Plateau during winter. Caribou that were collared on the plateau stayed there during the winter. During this reporting period, the center of caribou abundance, based on radio relocations, was the eastern section of the plateau, near the headwaters of Berry and Bear Creeks. Most calving apparently took place in this area. Not all the collared animals could be located on each relocation flight which suggests that some movements away from the main plateau and Little Gerstle highlands occurred. A small band of approximately 35 caribou has been observed wintering in the upper Jarvis Creek drainage, but it is not known if these caribou are part of the Macomb Herd.

Management Summary and Recommendations

The Macomb Herd may be limited by predation as evidenced by the fall 1982 survey data which revealed low numbers of subadult animals and a 1983 calving survey which indicated relatively few calves present shortly after the peak of calving. The 1st substantial improvement from chronically low subadult survival rates followed the removal of several wolf packs from the herd's range. Consequently, wolf control should be continued and increased harvests of grizzly bears should be encouraged. Additional work is needed to determine the cause of early calf mortality, including the possible role of weather.

Radio-collared caribou have greatly facilitated locating caribou for obtaining sex and age composition data and productivity data. Radio telemetry also appears to be the most feasible way to determine herd movements.

Priority work for the coming year should include the following: obtain reliable fall sex and age composition data to determine if the apparently reduced bull:cow ratio in 1982 was real, and also to determine calf survival to fall; obtain a reliable population

estimate to help determine the population trend; conduct counts in late May to determine initial calf production and attempt to determine causes of early calf mortality if it is substantial; continue to evaluate the benefit of continued or increased carnivore reductions (principally wolves and grizzly bears); and maintain or increase the number of radio-collared caribou including collaring of several caribou wintering in the Jarvis Creek drainage.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 20E

HERD: Fortymile

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

A June 1983 photocensus produced a minimum population estimate of 12,500 caribou in the Fortymile Herd, and it is likely that the herd contains 14,000 or more caribou. However, management decisions will continue to be based upon the minimum population estimate. The Fortymile Caribou Herd has increased from an estimated low of 4,000-6,000 in 1974 to 12,500 in 1983, an average annual growth rate of 8-14%.

Data are inadequate to demonstrate that the rate of growth has accelerated since the number of wolves was reduced in winter 1981-82 in a 3,000 mi^2 portion of the herd's range. However, it seems probable that the wolf reduction should have lowered caribou mortality. In addition, increased harvest of grizzly bears by hunters in the herd's postcalving area should help reduce neonate mortality.

Population Composition

On 29 September 1982, 1,625 caribou were classified during the herd's fall migration, near the headwaters of the Middle and Mosquito Forks of the Fortymile River. Caribou were classified both by observers on the ground using spotting scopes and from the air using a helicopter. Bulls composed 30% of the sample, compared to 29% in 1981. The bull:cow ratio was 54:100, compared to 52:100 in 1981. Small bulls (185/1,625) were relatively abundant, indicating good survival of the 1981 calf crop from 4 to 16 months of age. The observed calf:cow ratio was 27:100, compared to 31:100 in fall 1981.

A short yearling survey was conducted on 19 April 1983, and 387 caribou were classified. The short yearling:cow ratio was 29:100 and indicates excellent overwinter survival of the 1982 cohort from 4 to 11 months of age. However, this sample was obtained only from those caribou (over 50% of the herd) that wintered in the area where wolves have been reduced, so it may overestimate short yearlings in the entire herd.

Spring sex and age composition surveys were conducted on 8 and 19 June 1983, and respective samples of 3,118 and 1,252 were obtained. Calf:cow ratios of 35:100 and 38:100 were observed on June 8 and 19, respectively. Bulls and yearlings were underrepresented in both June surveys due to segregation of the herd on the postcalving area. The moderate calf production and survival figures indicate a rather substantial rate of calf loss shortly after calving (assuming normal natality rates, for which there is some supporting evidence).

Seasonal Concentrations and Movements

Herd movements during this reporting period were similar to movements observed during 1981-82. The Porcupine Caribou Herd, however, did not migrate south of the Yukon River as in 1981-82, and, consequently, there was no mixing of the 2 herds.

The herd was scattered during summer, and the 1982 fall migration was similar to that for fall 1981. Calving occurred from Slate Creek to the east slopes of Mt. Harper, and postcalving aggregation took place on Mt. Harper and the upper Middle Fork in 1983.

Mortality

Predation by wolves, grizzly bears, and, perhaps, golden eagles apparently is the primary mortality factor on the Fortymile Caribou Herd, particularly during and shortly after calving. As a result of increased grizzly bear harvests and 2 winters of wolf control, the predation rate has undoubtedly been reduced. Since winter 1981-82, wolf density has been reduced from 1 wolf/30-35 mi^2 to 1 wolf/100-200 mi^2, over 40% of the herd's range.

Hunters reported taking 110 bull caribou during the 1982-83 season; 65 were taken in the early season and 45 in the late season. Because the bag limit was increased from 1 to 2 caribou, the 1982-83 harvest increased 59% over the 1981-82 take. In addition, 5 caribou were known to have been poached. Due to increased enforcement efforts on the Taylor Highway during October 1982, the observed number of violations was only 50% of the 1981 level. The annual illegal kill by miners in the summer probably equals 50% of the legal reported kill. Total estimated human kill for 1982-83 was apparently less than 2% of the herd and consisted primarily of males.

Management Summary and Recommendations

In 1983, the Fortymile Herd contained at least 12,500 and probably contained 14,000 or more caribou. The herd has apparently increased continuously since 1974 at a mean annual rate of 8-14%. Though the herd has grown since 1974, it is probable that the rate of increase has accelerated since wolf control began in 1981, but data are inadequate to confirm the supposition. Further herd increases are anticipated as a result of continuing wolf management and greater harvests of grizzly bears. Legal

human take should be limited to less than 4% of the herd annually and directed primarily at male caribou.

The greatest potential threats to the long-term welfare of the Fortymile Caribou Herd are proposed mineral development in the Glacier-Eldridge-North Peak calving area, potential development of the Mt. Harper postcalving area, roads associated with both possible developments, and the proposed extension of the Alaska Railroad. The proposed extension of the Alaska Railroad through the Ladue River valley would directly increase caribou mortality by trains hitting caribou, particularly during winters of deep snowfall. Consequently, continuing investigation of caribou movements will provide a basis for recommendations regarding proposed developments.

As the Fortymile Herd continues to grow, annual harvests should be increased incrementally to provide for demand for caribou hunting near the road system. An additional October, either-sex permit hunt should be considered for the 1984-85 season with a quota of 100 permits. With an estimated total harvest of 250 caribou, human harvest would approximate 1.9% of the herd.

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CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

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

HERD: Western Arctic

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The Western Arctic Caribou Herd (WAH) is currently the largest caribou herd in the State and ranks as one of Alaska's major terrestrial resources. Since the early 1970's, the WAH has undergone a rapid decline and recovery and will soon be as large as it was prior to the decline if growth continues at the 1976-1982 rate. A brief summary of population fluctuations is presented in Anderson and James (1983).

We conducted a full-scale aerial photocensus of the WAH in July 1982. A detailed account of results and methods is available from Department files (James and Anderson, unpubl. data). A total of 171,699 caribou were accounted for with several methods, including aerial photographs, 35 mm slides, direct counts, and coastal plain transects. Eight aggregations were photographed on 6 July with a Fairchild T-11 9 x 9 inch aerial camera mounted in the photo-port of a DeHavilland Beaver. Major aggregations were located in the upper Kukpuk River drainage, near Spiny Ridge, near Cape Thompson, and in the Lisburne Hills. The largest single aggregation numbered 53,245 and was located on the upper Kukpuk River. Scattered bull aggregations were counted in the upper Kivalina River drainage and in the Wulik Peaks.

Aerial 9 x 9 photographs accounted for 138,342 caribou. Direct counts and 35 mm slides accounted for 29,022 caribou. An additional 4,335 ± 3,063 (mean ± 95% CL) were estimated from aerial transects to be present on the coastal plain.

Most sources of error in the census procedure contributed to underestimation, so 171,699 caribou should be considered a minimum estimate. However, based on the distribution of radio-collared animals, we feel confident that the herd did not exceed 187,000.

From 1976 to 1980, the WAH grew at a mean annual rate of 14-16%. Results of the 1982 photocensus suggest an annual growth rate of 11% from 1980 to 1982. However, photocensus estimates are not precise enough to detect changes in rate of increase of a few percent. Assuming an increment of 11-14% from 1982 to 1983, we

believe that the WAH numbered 191,000-196,000 at the end of this reporting period, and we expect it to number at least 212,000 at the time of the 1984 census.

Population Composition

Fall herd composition was determined from 5 surveys flown on 5-9 October 1982 (Table 1). Calf:cow ratios varied from 36:100 in the Selawik Flats-Kauk River area to 87:100 in the Selawik Hills-Tagagawik River area. The overall calf:cow ratio was 60:100 when the samples were pooled. However, this estimate is probably conservative. The weighted mean ratio was 65:100, based on estimated caribou numbers in each of the sampled areas as determined by direct observation and the distribution of radio-collared animals. Twenty-seven percent of the pooled sample consisted of calves, compared with 22% in fall 1981. These values are indicative of good calving success and low neonatal mortality.

The variability in composition ratios between survey areas (Table 1) is suggestive of a relatively high degree of segregation by sex and age in fall. Clearly, the major obstacle to accurately estimating population composition is the procurement of a random and representative sample.

Spring composition surveys were flown in 3 areas in March 1983 (Table 2). Calf percent of the herd varied from 22% in the Aniak River-John River area to 26% in the Selawik Hills and north Buckland River drainage. Calves composed 24% of the pooled sample ($\bar{N}$ = 6,772), indicating a short yearling recruitment rate of 31.6%. This value is comparable to that of 1982 (23% calves, or 29.9% recruitment) and is indicative of a rapidly growing herd.

In the Brooks Range (Aniak River-John River), group size varied from a few animals to nearly 1,000. Caribou southwest of Chandler Lake were moving north-northwest in March. Most caribou in the Brooks Range had apparently already begun the spring migration. All tributaries of the upper Killik River that were surveyed showed signs of intensive winter use.

In the North Slope foothills (Killik River-Nanushak River), group size in March varied from a few animals to about 750. Most bands were widely scattered and consisted of 20-100 animals. The Chandler and Anaktuvuk River area was extensively cratered and crisscrossed with caribou trails, suggesting heavy winter use.

In the Selawik Hills and northern Buckland River drainage, group size in March varied from a few to more than 10,000 animals. Most caribou were sedentary at the time of the survey. The heaviest concentration was observed in the upper North Fork of the Buckland River and extended northward into the Mangoak River pass. Caribou were present virtually everywhere between the Tagagawik and Buckland Rivers, north to the 250 ft contour (aeronautical sectional) and south to the 250 ft contour.

Calving ground surveys were conducted during 2-9 June 1983. On 2 June, we flew radiotracking surveys and made general observations on the distribution of calving bands. Some calves were observed as far west as Eagle Creek, as far east as upper Carbon Creek, and north along the headwaters of the Kaolak River. The densest cow aggregations were found from Omicron Hill north to the Utukok River; high concentrations of cows were also observed for 20-30 mi north of the Utukok River in the upper Kaolak River drainage. During radiotracking flights on 2 June, 464 caribou were classified, primarily from Omicron Hill north to the Utukok River. Only 28 of these were calves, indicating a calf:cow ratio of less than 6:100.

During 3-6 June, freezing drizzle, wind, subfreezing surface temperatures, and some blowing and drifting snow prevailed over much of the Arctic Slope. No additional flights were made until 7 June, when a survey of the area from Driftwood to Omicron Hill (not including the core calving area) revealed 46 calves:100 cows (Table 3). On 9 June, a survey of the Upper Ketik River revealed 38 calves:100 cows. Many nonreproductive animals were present, however, and the area northeast of Eskimo Hill was clearly not included in the core calving grounds. Also on 9 June, a survey of the core area north of Omicron Hill produced 90 calves:100 cows (Table 3).

We conclude that 1983 calving success was normal, that inclement weather did not substantially increase neonatal mortality, and that peak calving occurred prior to 9 June.

Mortality

Natural mortality estimates for the WAH are available in Davis and Valkenburg (1983). Wolf predation did not appear to be excessive south of the Brooks Range during the reporting period, and appeared to be very low north of the Brooks Range. In March 1983, the Chandler and Anaktuvuk River area showed extensive signs of heavy winter use by caribou. However, no kill sites, ravens, or wolf tracks were noted. No wolves were seen during calving ground surveys; however, gizzlies were fairly common in the southern portion of the calving ground, and several bears with bloody muzzles were observed. No bears were observed in the core calving area near Omicron Hill, however, and bear predation is probably not excessive overall.

The combined 1982-83 harvest, based on harvest report and registration permit returns, was 1,509 animals, compared to 906 in 1981-82. Eighty-six percent of the classified harvest consisted of males (Tables 4, 5). Seventy-five percent of the reported harvest was taken in Unit 23; however, the actual Unit 26 harvest was probably largely unreported.

Thirty-nine percent of Unit 23 hunters bagged at least 5 caribou, while only 22% of Unit 22 hunters and 12% of Unit 26 hunters did likewise (Table 6). Based on harvest tickets alone, average kill per successful hunter in the range of the WAH was 3 caribou.

Eighty-four percent of successful hunters were Alaska residents, 6% were nonresidents, and 10% were unspecified (Table 7). Sixty-five percent of successful hunters were residents of the Unit in which they hunted (Table 8).

Management Summary and Recommendations

The highest priority in WAH management is to prevent a future decline to low numbers. Results of recent S&I activities suggest that the WAH has returned to a postcalving size of nearly 200,000 animals as of June 1983. When compelling evidence indicates a substantial reduction from this number, harvests should be reduced to reverse a further decline and to regain a postcalving herd of about 200,000. Predator management through more liberal seasons and bag limits or Department control programs will be considered if predation becomes excessive. At present, no such programs are contemplated.

Limiting population growth to prevent future declines should be a low priority; there is no clear scientific evidence that mainland caribou herds are range-limited in a density-dependent sense. If it becomes necessary to control growth of the herd to minimize conflict with the reindeer industry or to prevent undesirable redistribution of caribou, the following options should be considered in the order listed: increase the harvest by encouraging greater public participation in hunting; increase natural mortality by reducing harvests of major predators; and consider additional uses of caribou (e.g., for animal food, bait, or for purchase and sale) only if other control measures are not sufficient to achieve the desired reduction.

Expansion of the reindeer industry, together with growth of the WAH, may lead to increasing reindeer-caribou conflict. Caribou have been largely absent from the Seward Peninsula during the 20th century. However, during its recent growth phase, the WAH has occupied the northeastern Peninsula in increasing numbers, and has expanded westward. In the winters of 1981-82 and 1982-83, 5,000-10,000 caribou inhabited the area south of Candle. This trend has caused increasing concern among reindeer herd owners. The Department will continue to address this concern by conducting periodic reconnaissance flights on the Seward Peninsula during winter to determine the proximity of caribou to reindeer herds and by informing owners of impending conflict. However, the Department should discourage the expansion of reindeer herds already occurring on caribou range until suitable methods are developed to reduce interaction between caribou and reindeer.

The failure of management to prevent the decline of the WAH in the early 1970's was largely due to inadequate population monitoring. We have identified the biennial photocensus as our highest S&I priority. Spring and fall composition counts will be made, at least in photocensus years, to determine the sex and age structure of the herd. Spring calving ground surveys will be conducted annually, or as funding allows, to identify any unusual circumstances attendant to calving.

The reported harvest from the WAH has always been a small fraction of the actual harvest. The failure of rural residents to report their take is in part due to a lack of understanding of hunting regulations and the reasons for the reporting requirement. The existing harvest ticket/registration permit system will be retained for another year in combination with an extensive public communications effort to increase issuance and return. If the current reporting rate is not doubled in 1 year, optional methods of obtaining accurate harvest information should be considered, including a statistical survey of hunters, involvement of public schools in data collection, a system similar to the notebooks now used in Canada, and the employment of village data collectors. Game and Subsistence Divisions should cooperate closely on all future aspect of harvest data collection.

Northwestern Alaska is entering a period of unprecedented industrial growth. The highly migratory WAH may be particularly vulnerable to loss of migration routes and key calving and wintering areas through oil and mineral development. The Department should advocate low-impact alternatives to exploration and development when they can be identified, particularly with respect to transportation corridors. The Department should continue to explore new technologies in habitat selection and habitat inventory investigations. A pilot project to determine the effectiveness of satellite telemetry as a management tool will be undertaken during the next reporting period. Conventional telemetry efforts will be continued, and 10 additional animals will be instrumented on the Kobuk River in September 1983.

The Region V staff has developed a strategic management plan for the WAH. The plan more thoroughly embraces the above discussion, and is currently being reviewed by Subsistence Division and by the public.

No changes in seasons or bag limits were recommended.

Literature Cited

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Table 1. Sex and age composition of the WAH, October 1982.

Survey area	Bulls/ 100 cows	Yrlgs/ 100 cows	Calves/ 100 cows	% yrlgs	% calves	Sample size
Selawik Flats-Kauk River	64	20	36	10	18	1,174
Selawik Hills-Tag. River	111	51	87	17	29	841
Ambler	49	22	60	10	29	3,399
Selby Lake	75	38	76	15	30	598
Anaktuvuk River	49	20	68	9	31	986
Means	59	25	60	11	27	
Total						6,998

Table 2. WAH spring composition survey, 1983.

Survey	Location	Total caribou	Calves	% calves in herd
3/23/83	N. Slope foothills, Killik R.-Nanushak River	2,679	638	24
3/24/83	Selawik Hills and N. Buckland R. drainage	2,681	706	26
3/28/83	Brooks Range, Aniak R.-John R.	1,367	304	22
Means				24
Totals		6,727	1,648	

Table 3. Calf:cow ratios on the WAH calving grounds, June 1983.

Survey date	Cows	Calves	Yrlgs	Calves/ 100 cows	Sample size
6/7/83[a]	466	215	280	46	961
6/9/83[b]	47	18	86	38	151
6/9/83[c]	539	485	38	90	1,062

[a] Survey conducted along Utukok River from south of Driftwood to Omicron Hill, but not including "core" area.

[b] Survey conducted northeast of Eskimo Hill in headwaters of Ketik River, but not including "core" area.

[c] Survey conducted entirely within "core" area north of Omicron Hill.

Table 4. Sex composition of WAH harvest by GMU based on harvest report returns, 1982-83.

Unit[a]	Males		Females		Unclassified	Totals
	No.	%[b]	No.	%[b]		
22	45	90	5	10	0	50
23	897	88	120	12	21	1,038
25	14	100	0	0	0	14
26	273	88	39	13	4	316
Means		86		12		
Totals	1,229		164		25	1,509

[a] Indicates location of kill.
[b] Indicates % of classified harvest.

Table 5. Sex composition of WAH harvest by GMU based on registration permit returns, 1982-83.

Unit[a]	Males		Females		Unclassified	Totals
	No.	%[b]	No.	%[b]		
23	51	58	37	42	0	88
26	2	--	0	--	1	3
Means		59		41		
Totals	53		37		1	91

[a] Indicates location of kill.
[b] Indicates % of classified harvest.

Table 6. Caribou harvested per hunter from the WAH based on harvest ticket returns, 1982-83.

Unit[a]	No. caribou harvested					
	0	1	2	3	4	5
22	7 (30%)	3 (13%)	4 (17%)	2 (9%)	2 (9%)	5 (22%)
23	31 (9%)	55 (16%)	49 (15%)	45 (13%)	25 (7%)	130 (39%)
26	43 (17%)	103 (41%)	50 (20%)	16 (6%)	8 (3%)	29 (12%)

[a] Indicates location of kill.

Table 7. Residency status of successful hunters based on WAH harvest ticket returns, 1982-83.

Unit[a]	Alaska residents (%)	Nonres. (%)	Unspec.	Totals
22	13 (72)	0 (0)	3	16
23	273 (89)	6 (2)	25	304
25	4 (67)	0 (0)	1	5
26	112 (77)	21 (14)	7	140
Totals	402 (84)	27 (6)	36	465

[a] Indicates location of kill.

Table 8. Proportion of hunters residing within the Unit in which they hunted, based on WAH harvest ticket returns, 1982-83.

Unit[a]	Residing within Unit or unspecified	Residing elsewhere
22	16	0
23	231	73
25	1	4
26	53[b]	87
Totals	301	164

[a] Indicates location of kill.
[b] 36 from Barrow.

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 25 and 26C

HERD: Porcupine

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

During the 1960's and early 1970's, the Porcupine Herd (PH) was stable at about 100,000 caribou. In 1979, a minimum estimate of herd size was 110,000 animals; good productivity/recruitment and low hunting mortality suggested that the herd was probably increasing.

An aerial photo-direct count-extrapolation census in July 1982 indicated a population size of 137,264 (125,174 actual photo count). This census confirmed that the PH had been increasing at a rate of 6-8% per year. Although this rate of increase is lower than for the other arctic herds in Alaska (approximately 14% per year for the Western Arctic and Central Arctic Herds), it still indicates a very productive population.

Population Composition

A survey of the highest density calving area in June 1982 indicated good initial productivity for the main calving segment of the PH (Table 1). Midsummer counts of isolated segments of the postcalving aggregations were inconclusive, and neither the individual counts nor the composite mean may be representative of overall herd composition. However, the generally lower calf:cow ratios from calving to early July suggest some early summer loss of calves.

Mortality

Despite a requirement for hunters to use caribou harvest tickets and harvest report cards, only 101 people reported hunting caribou in the PH range during the 1982-83 season. In Unit 25, 41 of 86 hunters were successful and took 62 caribou. Twelve of 15 hunters in Subunit 26C harvested 31 caribou. Virtually the entire reported harvest in Unit 25 was by "sport" hunters residing outside Unit 25; most of the reported harvest in Subunit 26C was by Kaktovik residents.

As in past years, local "subsistence" harvest was mostly unreported. Caribou harvest reporting was first required in 1976, but no report cards have ever been received from any village in Unit 25 except Fort Yukon. A few Kaktovik residents obtain harvest tickets, but most do not. Thus, local harvest of the PH in Alaska, in most years the most significant use of the herd, can be only roughly estimated. Kaktovik residents took at least 75 PH caribou in Subunit 26C according to Subsistence Division records, but 6 families known to have hunted caribou were not included in this estimate. The actual number of caribou taken at Kaktovik was probably near 100. Caribou were plentiful near Arctic Village from October through March. Arctic Village residents (and/or visiting friends and relatives) took 300-400 caribou in Unit 25, according to a rough estimate by the Subsistence Division. During past years of caribou abundance, harvest estimates at Arctic Village and other villages of similar size have been 2-3 times higher than the harvest reported for the 1982-83 season. Fort Yukon residents probably killed at least 50 caribou; the exact harvest at Venetie is unknown but was probably about 200.

The total harvest of PH caribou in Alaska was at least 600, and may have been 1,000 or slightly more. The reported harvest in Canada was about 2,400, including 400 taken by Old Crow residents, 500 by Aklavik, and 1,500 by Fort MacPherson. Overall harvest was less than 3% of the herd.

Management Summary and Recommendations

Results of the 1982 census of the PH confirm that the herd is growing. Current levels of harvest appear to be sufficiently conservative, but more restrictive measures might be necessary if recruitment decreases and/or natural mortality increases. The present regulations have little or no effect on local hunters, who have traditionally hunted whenever caribou were available and taken as many caribou as desired. Thus, the longer season (closing date extended to 30 Apr) approved for the coming regulatory year will not restrict the subsistence harvest, and will, in fact, legalize the substantial April kill which has always taken place--established seasons notwithstanding. Undoubtedly, some illegal take during May will continue, especially in Subunit 26C.

The later closing date may increase the sport harvest somewhat, as fly-in hunters can take advantage of the longer days and warmer weather in April. The opportunity to transport an additional caribou out of the Unit of take (3 instead of 2) will probably not increase harvest appreciably; most hunters cannot afford to transport more than 2 caribou.

From the biological standpoint, the bag limit for PH caribou could be increased. In fact, a system effectively allowing unlimited take (provided none are wasted or sold), such as that currently in force for the Western Arctic Herd, could be initiated for the PH. The restriction on transport out-of-Unit could also be lifted. If more liberal regulations are adopted, greater

emphasis should be placed on educating local residents of the need for better harvest reporting and the possibility of more restrictive measures in the future.

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Table 1. Sex and age composition counts of the Porcupine Herd, 1982.

Survey date	Cows		Calves			Yearlings			Bulls			Total
	No.	%	No.	%	/100 cows	No.	%	/100 cows	No.	%	/100 cows	
6/8/82	851	52	670	41	79	108	7	16	0	0	0	1,629
7/6/82	2,883	46	1,606	26	56	718	11	25	1,083	17	38	6,290
7/7/82	1,563	19	665	8	43	1,112	14	71	4,742	59	303	8,082
7/8/82	2,594	49	734	14	28	1,123	21	43	895	17	35	5,346

CARIBOU

SURVEY-INVENTORY PROGRESS REPORT

GAME MANAGEMENT UNIT: 26B

HERD: Central Arctic

PERIOD COVERED: 1 July 1982-30 June 1983

Season and Bag Limit

See Hunting Regulations No. 23.

Population Status and Trend

The Central Arctic Herd (CAH) has grown from approximately 5,000 caribou in 1975 to an estimated 9,000 in 1981. Calf production and yearling recruitment were high during this reporting period, and the CAH is presumably still increasing. Industrial development near Prudhoe Bay continues to affect local distribution and movements of CAH caribou, but there has been no detectable effect on herd productivity.

Population Composition

Fewer and less intensive sex and age composition surveys were conducted during this reporting period than in most previous seasons. Nevertheless, the results indicate good initial calf production and excellent yearling recruitment for the calf cohort (Table 1).

Mortality

Seventy-eight people reported hunting CAH caribou during the 1982-83 season; 55 hunters were successful and harvested 81 caribou. Most successful hunters killed only 1 caribou, with only 3 hunters taking the bag limit of 3 (1 hunter took 4 CAH caribou and another took 5 in adjacent Subunits having higher bag limits).

About half of the hunters used the Dalton Highway for access, while most others flew into the area. Fly-in hunters had a slightly higher success rate than road hunters (73% versus 66%), while successful road hunters took slightly more caribou per hunter (1.5 versus 1.4).

Some illegal and/or unreported hunting occurred along the Dalton Highway. In 3 locations, snowmachine trails leading to caribou gut piles were noted during surveys in late March, yet only 1 hunter reported using a snowmachine for access. Several gut piles were observed well within the area closed to firearms hunting, and it is highly unlikely that any of these caribou were taken with bows and arrows.

As in previous years, local subsistence harvest by Nuiqsut, Kaktovik, and Anaktuvuk villagers was mostly unreported. Kaktovik residents allegedly took about 25 CAH caribou during the closed season in May. Harvest by residents of other villages is unknown.

Combined legal/illegal harvest and natural mortality of the CAH remain far below recruitment levels, and the herd continues to grow.

Management Summary and Recommendations

The CAH is currently increasing, and harvest is low relative to herd productivity. Seasons and bag limits have been liberalized for the 1983-84 season: 1 July-30 April with a bag limit of 5 (females may be taken only from 1 Oct to 30 Apr). The new regulations may increase the take of bulls, since there will be 40 additional days early in the season when bulls are readily available from the Dalton Highway. It is doubtful, however, that the increased bag limit or the midwinter open season will substantially increase overall harvest. Little hunting is expected to occur during the winter months, and in the past, few hunters ever took the previous bag limit of 3 caribou. Because females may be taken only during late fall and winter, and because few are found along the Dalton Highway, it is doubtful that many cows will be harvested.

The liberalized regulations will have little effect on the subsistence harvest because local residents largely ignore the regulations. Although the new regulations will be more consistent with local harvest practices, some hunters will undoubtedly continue to exceed the legal bag limit and/or hunt during the closed season (i.e., during May). The regulations should be critically reassessed, changed where necessary (with a biological justification), and strictly enforced. To encourage compliance, local residents should be informed of the necessity for each regulation.

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Table 1. Sex and age composition counts of the Central Arctic Herd, 1982-83.

Season	Cows		Calves			Yearlings			Bulls			Total
	No.	%	No.	%	/100 cows	No.	%	/100 cows	No.	%	/100 cows	
Calving (6/82)	540	49	375	34	69	126	11	23	60	5	11	1,101
Spring (5/83)	413	40	224	21	54	--[a]	--	--	408	39	99	1,045

[a] Yearlings classified as adult cows or bulls.