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CARIBOU

Susan M. Abbott, Editor



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Project Title: Southcentral Alaska Caribou Management

Project Location: Unit 7 (3,520 mi²)
Kenai Mountains Caribou Herd

Project Objectives: Maintain the posthunting herd at about 400 until a carrying capacity is determined for their winter range.

Work Accomplished During the Project Segment Period: We observed 390 caribou comprised of 234 cows, 101 bull, and 55 calves during an aerial survey on 11 November 1992. Ratios were 43 bulls and 24 calves per 100 cows. Calves comprised 14% of the caribou observed.

We received 1,296 applications for 100 permits to hunt caribou (either sex) during 1992. Forty-seven of the permittees did not hunt and 15 (28%) of the hunters who went afield were successful.

Progress Towards Meeting Project Objectives: In 1984 the population objective for the Kenai Mountains herd was increased to 400 caribou (post-season) because herd size had increased from several years of high recruitment and moderate harvests. Caribou appeared to be expanding their winter range during the early to mid-1980s, something that further justifies increasing the population size objective. In 1985, however, when the highest number of animals was counted (401) the recruitment rate declined, and continued to do so through 1989. Recruitment increased in 1990. Studies have not been conducted to determine factors controlling herd size. However, deteriorated range from overgrazing during the 1980s is suspected. Increased predation may have been another cause.

The harvest of 15 caribou during 1992 from an estimated herd of 425 had an insignificant effect on herd growth.

Project Location: Subunit 15A (1,300 mi²)
Kenai Lowlands Caribou Herd

Project Objectives: To increase the herd to a minimum of 150 animals by 1995.

Work Accomplished During the Project Segment Period: An aerial survey on 8 June 1993 located 66 caribou including 16 (24%) calves. The herd was estimated to contain between 66 and 82 caribou.

We received 954 applications for 3 permits for the 1992 permit hunt. The 3 permittees hunted and harvested 2 bulls. A harvest of 3 bulls will not affect the production of young or significantly reduce herd growth.

Progress Towards Meeting Project Objectives: The Kenai Lowlands herd is healthy but not increasing in numbers. The management objective was extended to 1995. No open season was allowed during the 1993 season and this should remain in effect until the herd begins to increase.

Project Location: Subunits 15B and 15C (3,563 mi²)
Killey and Fox River Caribou Herds

Project Objectives: Reestablish viable caribou populations in suitable caribou range in Subunits 15B and 15C.

Work Accomplished During the Project Segment Period: We surveyed caribou from a fixed-wing aircraft on 11 November 1992. Search efforts were confined to the headwaters of Funny River (Killey River herd) and Fox River (Fox River herd). We tallied 222 caribou in the Killey River herd and 50 in the Fox River herd. Herd composition was 43 calves and 67 bulls per 100 cows in the Killey River herd and 44 calves and 74 bulls per 100 cows in the Fox River herd. We saw 29 caribou on 30 October 1992 in the Twin Lakes area.

Eighty caribou were transplanted during 1985 and 1986. The minimum fall 1992 population estimate was 272 caribou. This represents a 15% increase in numbers from the 237 caribou observed in November 1990.

Progress Towards Meeting Project Objectives: The management objective of reestablishing a viable caribou population in suitable habitat in Subunit 15B (Killey River herd) has been achieved. A permit hunt should be proposed to begin in autumn 1994. The Fox River herd in Subunit 15C is increasing in size but is not yet able to sustain a harvest.

Project Location: Subunits 9A, 9B, 9C, 17 and 19B (45,500 mi²)
Mulchatna Caribou Herd

Project Objectives: To maintain a minimum population of 25,000 adults with a bull:cow ratio of 35 bulls:100 cows.

Work Accomplished During the Project Segment Period: Returned harvest reports indicated that 1,602 caribou (74% males, 9% females, and 17% unknown) were killed by 1,391 hunters during this report period. Hunter success was 91%. Most successful hunters who returned harvest tickets were nonresidents (49%). Most hunters (84%) killed 1 caribou. Twenty-six hunters (3%) reported reaching the bag limit of 4 caribou and 5 reported killing 5 caribou. Hunters used aircraft most frequently for access (88%), boats

were used by 8% of the hunters, and snowmachines were used by 3%. The chronology of harvests was: August 30%, September 54%, October-February 7%, and March 8%.

Harvest data from harvest ticket reports must be viewed with caution because overlays were not keypunched and there was no way of objectively analyzing the rate of return. Actual caribou harvests by Alaska residents were probably considerably higher than the reported harvest. I estimate total harvest for 1992/93 at 3,000 - 5,000 caribou.

In March 1993, the Board of Game accepted a proposal to liberalize the caribou hunting season and bag limit within the range of the Mulchatna herd. For the 1993-94 regulatory year the season will be open from 1 August to 15 April. The resident bag limit will be 5 caribou (no more than 2 may be bulls), and the nonresident limit will be 2 caribou. This liberalization is intended to take advantage of current high population levels and attempt to limit herd growth.

We conducted a census of the Mulchatna caribou herd on 7 and 8 July 1992. We counted 110,073 caribou, and located 42 of 53 radio-collared animals. Based on the survey conditions, the number of animals observed, and the number of radios located, the Mulchatna herd appeared to contain more than 115,000 caribou.

No capture operations, calving surveys, or composition surveys were conducted during this report period. Census and capture efforts have been scheduled for alternate years because of budget constraints. Calving and composition surveys will be conducted when funding becomes available. Incidental observations suggested good overwinter survival and calf production comparable or slightly below 1992 levels.

Cominco Exploration-Alaska contracted the department to continue radiotracking flights to locate caribou collared near the proposed Pebble Copper mine (northwest of Iliamna Lake). Eight flights were scheduled for 1993.

Most of the Mulchatna herd moved off of winter ranges near Iliamna Lake and the Kvichak River and onto calving areas by late April. Calving areas were vacated by early June as caribou moved to their summer areas in the King Salmon and Tikchik River areas. These movements were about 2-3 weeks earlier than in recent years.

Caribou translocated from the Alaska Peninsula to the Nushagak Peninsula in 1987 continued to thrive during this report period. During a composition count in October 1992, USFWS and ADF&G biologists counted 611 caribou with a ratio of 60 bulls:100 cows. The precalving population estimate was 750 caribou in 1993. Most of the herd remained on the Nushagak Peninsula during this report period. A draft management plan was submitted for agency review in May 1993.

Progress Towards Meeting Project Objectives: The Mulchatna herd continued to expand in both population size and range. Early movements onto calving and summer

areas may indicate range overutilization or be a function of random movements. No range investigations were conducted in areas used by this herd. Trailing was extensive in areas traversed by the herd, but incidental observations indicated food availability was not a limiting factor.

Project Location: Subunit 9D and Unit 10 (4,900 mi²)
Southern Alaska Peninsula Caribou Herd

Project Objectives: To maintain the population between 5,000-6,000 in midsummer with an October sex ratio of 40 bulls:100 cows.

Work Accomplished During the Project Segment Period: We conducted a helicopter composition survey in October 1992, and classified 746 caribou. Ratios were 22 bulls and 22 calves per 100 cows. Calves comprised 15% of the fall sample, the same as found in the 1992 post calving aggregations.

A photocensus on 22-23 June 1993 revealed at least 1,495 caribou. Coverage of the summer range compared to previous years and we estimated the total herd size at less than 2,000, with 16% recruitment of calves from a weighted sample of 280 caribou.

Hunters reported killing 25 bulls. Hunter success was 88%. Chronology of the harvest by month was: September - 15, October - 1, November - 0, December - 7, January - 1, and February - 1. Local residents, other Alaskans, and nonresidents accounted for 32%, 16% and 52% of successful hunters, respectively.

Progress Towards Meeting Project Objectives: The Southern Alaska Peninsula herd has been below the population objective for several years and is still declining. Recent research has tentatively identified nutritional stress as the primary factor causing poor body condition and low productivity among these animals. Considering the very low recruitment and high natural mortality of adult females, it appears unlikely that any management strategy will result in meeting the population objective established 10 years ago when the herd was increasing and eventually peaked in 1983 at 10,200 animals. Hunting regulations have been restricted several times in the past 5 years to a bag limit of 1 bull. This may have contributed to the low bull:cow ratio observed in recent years, but was not believed to be causing further decline in the herd.

Research on range conditions is under way, and a cooperative management plan with Izembek National Wildlife Refuge is in draft form. New population objectives jointly agreed to by the ADF&G and the USFWS in 1991 call for a complete hunting closure if the winter count drops below 2,500 animals. A winter survey in January 1993 by the Izembek National Wildlife Refuge personnel. Staff found only 1,920 animals. The continued decline of the herd was verified by the 1993 post-calving census, and the 1993-94 state hunting season was closed by emergency order.

Project Location: Subunits 9C and 9E (24,000 mi²)
Northern Alaska Peninsula Caribou Herd

Project Objectives: To maintain the population at 15,000 to 20,000 in midsummer with an October sex ratio of at least 40 bulls:100 cows.

Work Accomplished During the Project Segment Period: We conducted a helicopter composition survey in October 1992, and classified 2,766 caribou. Ratios were 40 bulls and 44 calves per 100 cows. Calves comprised 24% of the fall sample, compared to 31% found in the 1992 postcalving aggregations.

A photo-census on 22-23 June 1993 revealed a minimum of 15,000 caribou. Coverage of the summer range was comparable to previous years and we estimated the total herd size at 16,000 to 17,000 with 30% recruitment of calves from a weighted sample of 2,436 caribou. This population estimate was slightly below the 1992 count but was within the range of counts made during the last 10 years and reflects a relatively stable population.

Hunters reported killing 788 bulls, 94 cows, and 3 unspecified caribou. Hunter success was 81%. Chronology of the harvest by month was: August - 85, September - 323, October - 117, November - 22, December - 65, January - 68, February - 100, March - 101, and 4 were unspecified. Local residents, other Alaskans, and nonresidents accounted for 14%, 44%, and 42% of hunters, respectively but because of the 1-caribou bag limit for nonresidents, they accounted for only 30% of the reported harvest. The unreported sport and subsistence harvest was estimated at 400 and 700 respectively, resulting in a total harvest estimate of 2,000.

The Board of Game extended the hunting season in Subunit 9E thru April 1993, but only 1 caribou was reported taken during that month.

Progress Towards Meeting Project Objectives: Population estimates the past 3 years were in the range of 16,000-17,500 caribou, and were lower than the estimates for 1988 and 1989 (>20,000). Liberal hunting regulations have contributed to maintaining the herd within the population objective during the past 10 years while maintaining the desired sex ratio. Changes in the herd's distribution have led to an increased harvest during the winter when caribou were accessible along the Naknek/King Salmon road system.

Project Location: Unit 10 (300 mi²)
Adak Caribou Herd

Project Objectives: To maintain the precalving population at 150.

Work Accomplished During the Project Segment Period: Three replicate helicopter surveys were flown on 21-23 May 1993. Because of knowledge gained on previous flights

the final survey was the most accurate. We observed 661 caribou composed of 501 adults and 160 (24%) calves. Because of the timing of the surveys some cows had yet to give birth and an additional 75-100 calves may have been born during the season. The fall 1993 population should exceed 700 animals.

Hunting of this herd was administered by permit, and 346 permits were issued in regulatory year 1992-93. The total harvest was 137 caribou (81 bulls and 56 cows) a 5-year low. Hunter success was 56%. Forty-one percent of the successful hunters took 2 caribou and 59% killed 1 caribou, with successful hunters spending about 8 days afield. Sixty-five percent of the harvest occurred during September-November.

Progress Towards Meeting Project Objectives: The management objective of maintaining the precalving population at 150 caribou was exceeded during this reporting period. There was continued concern that herd growth cannot be managed by sport harvests in the future. The military community on Adak Island will decline in size in the future and the sport harvest will probably decline also. In response to this problem the Board of Game passed an emergency regulation in March 1993 extending the 1992-93 season through the end of June. This regulation was adopted for the 1993-94 hunting season. Currently the department and the U.S. Navy are discussing options dealing with the Adak herd.

Project Location: Unit 11 (13,300 mi²)
Mentasta Caribou Herd

Project Objectives: To maintain a minimum overwintering population of 2,500 adults and a minimum posthunting bull:cow ratio of 35:100.

Work Accomplished During the Project Segment Period: The October 1992 post-rut estimate for the Mentasta caribou herd was 1,426 animals, of which 1,373 were adults and only 53 (4%) were calves. There has been virtually no calf recruitment since 1991 in the Mentasta herd. We conducted the postcalving aggregate counts in late June 1993 and tallied 880 caribou. Preliminary results of a National Park Service study of neonatal calf survival indicated survival of calves born during spring 1993 was very low. All calf mortality was attributed to predation, mostly wolf and brown bear. Adult cows have been radio-collared as part of the herd monitoring program and the calf mortality project. All of the cows collared in the last few years have been older age class adults, suggesting little or no recruitment. Adults are also subject to predation.

A state hunt has not been conducted for Mentasta caribou since 1991. The National Park Service cancelled a registration subsistence hunt for local rural residents during the fall of 1992 because of the continued decline in herd size.

The Mentasta caribou herd summered on traditional range along the western slopes of Mt. Sanford and Mt. Drum. By early October a portion of the herd moved northeast into Unit 12 and some caribou moved into the Snag and Beaver creek drainages in the Yukon Territory, Canada or as far north as Chicken in Subunit 20E. Radio-collared Mentasta caribou also wintered in Subunit 13D, from Klutina Lake south to the drainages of the Tonsina River and were mixed in with several thousand Nelchina herd caribou. In Unit 12 and Subunits 13D and 20E and Canada, some Mentasta caribou were subject to subsistence harvest by local residents intended for other caribou herds. The impact of these harvests was unknown. The herd returned to normal calving areas between Drop Creek and the Sanford River by late April 1993.

Progress Towards Meeting Project Objectives: Current herd size is well below the minimum management objective of 2,500 adults. The stated management objective is unrealistic given current levels of calf predation. This objective was established while the herd was increasing, possibly because predator numbers were lower, and may have been overly optimistic. Historic data suggests a herd objective of 1,500-2,000 adults may be more realistic. This herd spends most of the year within Wrangell-St. Elias National Park and Preserve. Management activities designed to increase the size of the herd are hampered by park management objectives.

The large rapid decline in the Mentasta caribou herd is caused by very low neonatal calf survival. Predation on newborn calves is so heavy that few survive until fall. The nearly complete lack of recruitment during recent years, combined with natural mortality of adults, accounts for the decline. Legal subsistence hunting has had little impact on this herd over the past 5 years, virtually 100% of the animals taken were bulls and total harvest was low. This harvest was stopped in 1992, yet the herd still declined. Poaching, winter harvest in other units, and harvest by treaty Natives in Canada occurs when Mentasta caribou mix with the Nelchina herd on winter range. Some Mentasta caribou wintered in Subunit 13D during 1992-93 and could have been taken in the Unit 13 winter subsistence hunt. Elimination of this incidental take will be impossible as long as harvest of mixed herds is allowed during winter months. All hunts specifically intended for Mentasta caribou should be eliminated until recruitment improves and the herd starts to increase.

Project Location: Unit 13 (25,000 mi²)
Nelchina Caribou Herd

Project Objectives: To maintain the herd at 30,000 overwintering adults with a minimum bull:cow ratio of 35:100 by harvesting the annual growth increment.

Work Accomplished During the Project Segment Period: The October 1992 postrut estimate for the Nelchina herd was 45,484 of which 35,484 were adults (>1 yr). The estimate was extrapolated from a June 1992 postcalving aggregate count of 46,948

animals comprised of 53% cows and the September 1992 sex and age survey which tallied 48 bulls:100 cows and 40 calves:100 cows. The June 1993 postcalving spring count was 46,226 caribou with 54% cows. The number of cows observed did not change between 1992 and 1993. Calf production and survival in spring 1993 was the lowest observed in years, with 37 calves:100 cows compared to 63 calves:100 cows in 1992. A postcalving udder count was conducted on radio-collared adult cows to check parturition rates in the Nelchina herd because of low calf production observed in other interior herds during 1993. The estimated calf:cow ratio for the adult cows was only 52:100. Apparently calf production was low in adult cows and virtually non-existent in young cows. The cause of the decline in productivity is unknown.

Two Nelchina caribou hunts were held during 1992. The fall and winter state hunt was a Tier II subsistence permit hunt with 6,500 permits issued and 3,438 caribou were taken. There were 5,183 Tier II permittees that hunted and the hunter success rate was 66%. The 1992 harvest was up 74% from the previous year's take of 1,973 caribou. Harvest composition figures indicate a total kill of 2,186 (64%) males and 1,232 (36%) females. The cow harvest increased by 153% over the previous year's take of 488 cows.

A fall and winter federal registration hunt was conducted in Unit 13 by the Bureau of Land Management on their lands along the Denali and Richardson Highways. Each hunter was allowed 2 permits (2 caribou bag limit) and 2,013 permits were issued for the federal hunt. Harvest figures showed 488 caribou were taken for a permit success rate of 24%. Harvest was down 25% from 1991 when 647 caribou were reported taken.

The herd's summer distribution in 1992 was similar to the previous year. Calving and postcalving use traditionally occurs in the eastern Talkeetna Mountains in Subunits 13A, 13E, and 14B. As the herd expanded more animals were summering in Subunit 13B along the Denali Highway and in northern Subunit 13C.

During fall 1992, the herd exhibited some aberrant migration and distribution patterns. During the last few days of the fall hunting season (September 17-20), a small segment of the herd was observed moving west across the Richardson Highway north of Sourdough. A week later, large numbers (approximately 40%) of the herd were observed moving east from the Alphabet Hills in Subunit 13B, across the Richardson, through the middle of Subunit 13C, and on towards Mentasta Pass. It was assumed these animals traveled on to Unit 12 and Subunit 20E. At the same time, another large segment of the herd (perhaps 30-40%) was observed in upper Chunilna Creek of southwestern Subunit 13E. Scattered bands were also observed in the Clearwater Creek and Maclaren River area, and in the upper Susitna area.

Periodic radio-tracking for the 41 radio-collared cow caribou helped determine the distribution of the Nelchina herd for the winter of 1992-93. At least 11 radio-collared cows and an unknown, but substantial portion of the herd were located in Unit 12 and Subunit 20E. Three radio-collared cows and an estimated 3,000 to 6,000 caribou remained

in the Tangle Lakes area of Subunit 13B most of the winter. Four radio-collared cows and 4,000 to 6,000 caribou wintered in the upper Chuniina Creek - Susitna River area. One radio-collared cow and several thousand caribou wintered in the hills east and south of Cantwell. Two radio-collared cows and 2,000 to 4,000 caribou wintered between Tonsina and Hudson Lakes in western Subunit 13D. Further complicating the issue, a number of radio-collared Mentasta caribou were mixed in with Nelchina caribou in Subunit 13D. One radio-collared cow and an unknown number of caribou were located south of the Chitina River near Tebay Lake in Unit 11. This individual had been located near the Chistochina River in Subunit 13C in early September 1992. Reports of scattered bands of caribou in eastern Subunit 13D were received throughout the winter.

Despite several radio-tracking flights, winter locations for only 22 of the radio-collared caribou were obtained. The wintering locations for a number of the radio-collared cows and a portion of the herd remained unknown. Caribou were not observed during the winter on the Lake Louise flats in Subunit 13A, where approximately half the herd wintered during the previous winter. By June 1993, most radio-collared caribou were located in the Talkeetna Mountains, indicating the segments of the Nelchina herd had rejoined on the traditional calving and summer grounds.

Nelchina Range stations were repaired and plant conditions evaluated during the summer of 1989. Range data is currently being analyzed and the results will be presented in a separate report.

Radio collars were placed on 9 cows during April 1993 bringing the total number of radio-collared caribou in the Nelchina herd to 41 animals.

Progress Toward Meeting the Project Objectives: The Nelchina caribou herd exceeded the management objective of 30,000 adults. Productivity declined appreciably for this herd based on spring 1993 post-calving calf:cow ratios. The reason for the decline in calf production is unknown but was known to occur in other interior Alaska herds. Harvest quotas have been increased to a level that should exceed annual recruitment, especially with this year's poor calf production, and stop herd growth. Stabilizing the herd is necessary because range stations indicate moderate to extensive damage in certain areas of the Nelchina's range especially within their calving and summer areas.

The bull:cow ratio exceeded the minimum objective for this herd. However the number of trophy bulls has been declining because of heavy harvest pressure. In order to maintain a high bull:cow ratio and a reasonable number of mature bulls, yet reduce the herd size, the number of cows harvested has been increased. Increased cow harvests were accomplished by requiring all animals taken during winter hunts within Unit 13 to be for antlered caribou only. Once the Nelchina caribou herd migrates out of GMU 13 and mixes with the declining Mentasta herd, a cow harvest is not a wise management option because the Mentasta herd has declined so drastically.

Segment Period Project Costs:

	<u>Personnel</u>	<u>Operating</u>	<u>Total</u>
<u>Planned</u>	85.2	66.8	152.0
<u>Actual</u>	85.2	51.9	137.1
<u>Difference</u>	0.0	14.9	14.9

Submitted by:

Jeff Hughes
Survey-Inventory Coordinator

Project Title: Region III Caribou Population and Habitat Management

Project Location: Units 19, 20, 21, 24, 25, 26B, and 26C

Chisana Caribou Herd (Unit 12)

Project Objectives and Activities:

1. Maintain an October bull:cow ratio of at least 30:100.
 - 1a. Conduct aerial census of the herd to determine size, trend, and productivity.
 - 1b. Monitor mortality factors affecting the herd.
 - 1c. Monitor harvest by issuing registration permits.

Work Accomplished During the Project Segment Period:

- 1a. We flew a sex and age composition count on 27 September 1992 and classified 1,142 caribou. The calf:cow ratio was 0.1:100 cows and the bull:cow ratio was 31:100. Between 23 and 31 May, we conducted daily radio tracking flights to determine the herd's pregnancy rate, median calving date, and the percentage of perinatal mortality. During FY93 the pregnancy rate was 50% which is substantially lower than what is normally found in Interior caribou herds. The median calving date was 26 May which is normal. The percent perinatal mortality was 14-25% compared to a more normal level of < 5% which indicates that the herd was in poor condition. The June 1993 extrapolated estimate of herd size was 1,000-1,100 caribou. During the June count only 0.8% of the herd was calf.
- 1b. We monitored radio-collared caribou jointly with the National Park Service. We estimated overwinter mortality rates for adult cows during 1 October 1992 to 23 May 1993. The overwinter mortality rate for adult cows was 28% which is much higher than normal (< 10%). Causes of mortality have not yet been determined.
- 1c. Hunters reported harvesting 17 bull caribou during FY93. We estimate the unreported harvest to be an additional 5-10 caribou. The harvest (about 2% of the herd) is not affecting population growth. The principal users of the Chisana herd were asked to voluntarily reduce their harvest. The area's guides and air taxi operators have complied and the annual harvest during the past 2 years has declined substantially.

Progress Toward Meeting Project Objectives: The Chisana herd is declining because of low calf recruitment. Adverse weather conditions and predators are thought to be the primary factors. Harvest has been reduced through a voluntary agreement with principal hunters and guides. Beginning in September 1993, a registration permit hunt will be implemented and a quota will be established annually based on the bull:cow ratio.

Big River Herd, Rainy Pass Herd, Beaver Mountains Herd, Tonzona Herd, and Sunshine Mountains Caribou Herds (Unit 19)

Project Objectives and Activities:

1. Increase herd sizes to:

Big River Herd	1,500-2,000
Rainy Pass Herd	1,000-1,500
Beaver Mountains Herd	1,200-1,500
Sunshine Mountain Herd	1,500-2,000
Tonzona Herd	1,800-2,000

1a. Monitor mortality factors including hunting, predation, and other factors.

1b. Estimate status, trends, and productivity of the herds from aerial surveys.

Work Accomplished During the Project Segment Period:

1a. Preliminary analyses of harvest tickets returned by hunters in the area indicated the following harvests: Big River Herd (including Farewell), 55; Rainy Pass Herd, 100; Tonzona Herd, 5; Beaver Mountains Herd, 5; Sunshine Mountain Herd, 2. No additional information was collected on predation or other mortality factors. Reported hunter success rate on all herds combined was 79%. These figures do not vary significantly from previous years' data except that 58 more animals were harvested from the Rainy Pass herd.

1b. Population estimates for the Beaver Mountains and Sunshine Mountain herds were not completed, but will be early in the next fiscal year. Hunting mortality remains quite low, but populations remain stable. Because of suspected heavy wolf and bear predation, these herds remained below the herd objectives listed above. Increases in those herds may depend on our management strategy to reduce predation effects.

Progress Towards Meeting Project Objectives: No progress was made towards identifying herd sizes in this area because of higher priority caribou censuses throughout Interior Alaska. During this report period, however, the Board of Game provided for

reduced season lengths and uniform season dates and bag limits for the units encompassing the range of the Rainy Pass herd.

Delta Caribou Herd (Subunit 20A)

Project Objectives and Activities:

1. Provide an annual combined Delta/Yanert caribou harvest of at least 500 caribou, with a hunter success rate of at least 30% by at least 1,000 hunters.
 - 1a. Monitor the annual reported harvest and conduct field interviews to estimate actual harvest.
2. Maintain a bull:cow ratio of at least 30:100 and a large-bull:cow ratio of at least 6:100.
 - 2a. Conduct annual fall composition counts.
3. To maintain a reasonably stable caribou population and avoid a precipitous decline in numbers.
 - 3a. Conduct annual photocensus of the herd.
 - 3b. Cooperate with Research Study 3.37 to "evaluate the influence of weather, density, food limitation, hunting, and predation on the population dynamics of the Delta Caribou Herd".
4. Gather information on predator:prey ratios and on the significance of predation and weather as natural mortality factors.
 - 4a. Cooperate with Research Project 3.37.

Work Accomplished During the Project Segment Period:

1. The hunting season for the caribou in Subunit 20A was closed in 1992-93 and we did not conduct any hunter check stations in the Alaska Range in fall 1992.
2. During a composition count on 28 Sept 1992, we classified 1,238 caribou, including 913 cows, 229 bulls, and 96 calves. This sample represented about 21% of the estimated herd size. We did not meet our objective to maintain 30 bulls:100 cows (25:100) and at least 6 large-bulls:100 cows (3:100). Recruitment remained low, with only 11 calves:100 cows and 8% calves in the sample. The distribution of the Delta herd was very unusual this year. We completed the entire composition

survey on the Tanana Flats, and found additional radiocollared caribou north of the Tanana River near Fairbanks. We also documented the presence of a portion of the Denali herd in the same vicinity as the Delta herd.

3. Based on a 29 June 1992 photocensus of the Delta herd, we considered the herd to include about 6,000 caribou. We counted 5,870 caribou during the photocensus, 96% (5,622/5,870) of which were in groups that had at least 1 radio-collared caribou in them. However, 16% (7/45) of the collared caribou were in groups of less than 10 caribou each, so there was a small portion of the herd that had not aggregated. Only 1 of 47 active radio-collared caribou was not located. Observations of calves during this photocensus was a noticeable contrast to their absence during the 1991 census.

Based on a 15 June 1993 photocensus, we now consider the herd to include 3,700 - 4,000 caribou. We counted 3,661 caribou in a 1,008 mi² area in the central foothills of Subunit 20A. The number of caribou that may have been missed was probably relatively low; our count included 44 of the 45 radiocollared caribou and sightability was good because most groups were tightly clustered on snowbeds for insect relief. The number of caribou seen in 1993 is only 62% of the number seen during the 1992 photocensus, a 38% decline.

4. We cooperated with Research Project 3.37 by assisting in the capture and weighing of 15 female caribou calves on 2-3 October 1992, and 9 female calves (plus 5 yearlings) on 23 April 1993. We also assisted in radiotracking the herd.

To estimate pregnancy and parturition, we completed a survey of the Delta herd calving grounds on 25 May 1993. We classified 690 caribou, including 604 cows, 59 calves, and 27 bulls. Only 41% (245/604) of the cows were parturient (distended udders, hard antlers, or calf-at-heel). In addition, only 24% (59/245) of those parturient cows had calves. Therefore, the overall calf:cow ratio was very low (10:100). This is the fourth year of poor recruitment. The core calving area for the Delta herd in 1993 was the Wells Creek drainage in Unit 13.

We compiled historical and current population data to discuss management options, including wolf control, that could help halt the population decline.

Progress Toward Meeting Project Objectives: We did not meet our objective to provide for a harvest of at least 500 caribou from the Delta herd because all hunting seasons on the Delta Herd were closed during 1992-93. The season was closed because herd size has rapidly declined from its record high of 10,700 in 1989, probably because of poor recruitment and higher adult mortality.

During the last 2 years, we have not met our management objectives to maintain 30 bulls:100 cows (29:100 in 1991, 25:100 in 1992) and at least 6 large-bulls:100 cows (5:100, 3:100).

We have not met our objective to maintain a reasonably stable caribou population and avoid a precipitous decline. Based on the photocensuses, the herd declined from approximately 10,700 in 1989 to only 3,700-4,000 by 1993.

Through Research Project 3.37, we have been gathering information on the significance of predation and weather as natural mortality factors.

In June 1993, the Board of Game discussed wolf management and regulations relative to Delta caribou herd management. Their decision to authorize a ground-based wolf control effort to temporarily reduce wolf numbers in portions of the Delta herd's range may be implemented by the department during FY94.

Macomb Caribou Herd (Subunit 20D)

Project Objectives and Activities:

1. Determine the size of the herd. Increase the herd to 1,000 animals by 1993, with a sex ratio of 40 bulls:100 cows and 10 large bulls:100 cows after the hunting season.
 - 1a. Conduct aerial census of the herd to determine size, trend, and productivity.
 - 1b. Monitor mortality factors affecting the herd.
 - 1c. Monitor the limited permit hunt.

Work Accomplished During the Project Segment Period:

- 1a. We conducted a photocensus survey on 26 September 1992, and counted 527 caribou. Composition data recorded during the census resulted in estimates of 14 calves:100 cows, 25 bulls:100 cows, and 9 large bulls:100 cows.

A composition survey is planned for early July 1993.
- 1b. Overwinter mortality of adult radio-collared caribou was approximately 15%. Eleven adult radio-collared caribou remained alive in June 1993.

- 1c. The Macomb caribou hunt season was closed during 1992-93 because of the declining trend in population size and our failure to meet sex composition objectives.

Progress Towards Meeting Project Objectives: No progress was made toward meeting the herd size objective, and herd sex composition did not meet objectives. Herd size decreased because of high overwinter mortality of adults and high mortality of calves. No permits will be issued to hunt this herd during the 1993-94 hunting season. New herd size management objectives will be established during the next year.

Fortymile Caribou Herd (Subunit 20E)

Project Objectives and Activities:

1. When weather-related nutrition is favorable, manage harvest and, secondarily, predation to increase the herd to 50,000 adults or 60,000 caribou by the year 2000.
 - 1a. Maintain or increase the number of radiocollars to assist in population census efforts during FY93.
 - 1b. Monitor harvest by issuing registration permits.
2. If the mean annual rate of growth is greater than 10%, allow a maximum harvest of 3% of the herd and 1.5% of the females until herd size reaches 50,000 adults or 60,000 caribou. If the mean annual growth rate is 0% to 10%, allow a maximum harvest of 2% of the herd and 0.5% of the females. During years when the herd is declining, hunting may be further restricted and steps to reduce predation will be recommended, assuming poor caribou nutritional status is not a major factor.
 - 2a. Monitor radio-collared caribou to determine mortality rate.
3. Maintain an October bull:cow ratio of at least 35:100.
 - 3a. Conduct fall sex and age composition counts.

Work Accomplished During the Project Segment Period:

- 1a. During FY93, 14 5-month-old female calves were radio-collared bringing the number of active radio collars in the herd to 81.
- 1b. During the 1992 state Taylor Highway registration permit hunt, 791 permittees killed 266 bull caribou. Six cows were known to have been killed illegally within the registration area. Sixty Fortymile caribou were harvested in Subunits 20B and

20D under a harvest ticket. With adjustments for nonreporting under the harvest ticket system, the total number of caribou killed during the state hunt was 332. The season was closed by emergency order on 15 September 1992. The harvest quota for the year was 395. A federal subsistence hunt for Fortymile caribou also occurred and 154 local residents harvested 56 caribou. Including illegal harvest, the total Fortymile caribou harvest in Alaska was 399.

- 2a. During FY93, the overwinter mortality rate of the radio-collared caribou was 6% for adult cows and 8% for female calves which is substantially below the rates observed during FY92 (17% for adult cows). Causes of the mortalities have not yet been determined.
- 3a. A posthunt composition count was flown on 26 September 1992 and 2,530 caribou were classified. The fall 1992 calf:100 cows and bull:100 cows ratios were 29.8:100 and 48.8:100, respectively. The bull:cow ratio was slightly higher than expected and probably was caused by an oversampling of bull groups due to herd distribution and timing of the survey in relation to the rut. We conducted the spring sex and age composition count on 16 June 1993 and we classified 3,143 caribou. The calf:100 cows ratio was 23:100 and the bull:100 cows ratio was 40:100. The low calf:cow ratio was a result of a low pregnancy rate (65%) and high perinatal mortality (20%).

Progress Toward Meeting Project Objectives: Because the annual growth rate of the herd had declined below 10%, the harvest quota was 2% of the estimated herd size and limited primarily to bulls. Because of the conservative quota and a bulls only restriction in a large part of the herd's range, harvest is not limiting population growth. Predation is the main factor retarding herd growth. A wolf control program designed to benefit the Fortymile Caribou Herd (FCH) was adopted by the Alaska Board of Game in November 1992. The plan was rescinded in January 1993. The department has been requested by the board to submit an alternative plan, utilizing different methods to reduce predation on the FCH during the June 1993 meeting. Regardless of the outcome of the meeting, the objectives for the FCH need to be scaled down. Because of adverse weather conditions and predation, the existing objective of 60,000 caribou by year 2000 will not be met. A new objective will be developed once a management plan is adopted.

Galena, Wolf, and Ray Mountains Caribou Herds (Units 21 and 24)

Project Objectives and Activities:

- 1. Determine population size, trend and identity of caribou herds in the Ray Mountains and Kokrine Hills by 1992.
 - 1a. Monitor mortality rates of radio-collared caribou.

- 1b. Conduct a fall composition count in the Galena Mountains herd.
- 1c. Monitor herd harvests through harvest reports and village contacts.

Work Accomplished During the Project Segment Period:

- 1a. Twenty Galena Mountain caribou were radio-collared in April 1992 on their winter range to give us better information on how to separate the Wolf Mountain herd from the Galena Mountain herd. Four collared caribou died or were killed by wolves and new collars were re-deployed in October 1992 on 4 cows. The USFWS continued to track the collared caribou throughout the winter.
- 1b. In October 1992 we flew a sex and age composition survey with an R-22 helicopter. Of 181 caribou classified, 49 were bulls and 9 were calves. The calf:cow ratio was 7:100 and the bull:cow ratio was 40:100. Very poor recruitment continues to restrict growth of this herd.

The BLM staff conducted a calving survey on 25-26 May 1993 and found 39 caribou with 5 calves and on 27 May USFWS staff found 93 caribou with 12 calves. Both results indicated very poor recruitment (13% calves) in the Galena Mountain herd. During the surveys, staff saw many black bears and observed one grizzly bear chasing caribou. Predation mortality is suspected to be contributing to low calf numbers.

- 1c. The reported harvest in these herds was 1 caribou with 26 unsuccessful hunters. The unreported harvest by Tanana residents of caribou in the Ray Mountains herd is estimated at 10 per year. There may have been some incidental take from the Galena Mountain herd during the winter when the season for Western Arctic caribou opened north of Galena.

Progress Toward Meeting Project Objectives: The Galena and Wolf Mountains herds will probably continue to remain small with little chance of growth until active predation management is initiated. Hunting mortality currently has no effect on population growth. The range of the caribou during winter makes them accessible to hunters using snow-machines, but the season is closed then to prevent overharvest. The expansion of the Western Arctic caribou herd (WACH) into the Galena Mountains herd winter range has increased the complexity of management of both herds. A winter hunting season for WACH frequenting the area is now regulated by emergency order to help solve the problem. The radio collars will also help in identifying herd distribution.

Caribou objectives for these three herds should be revised to reflect the following:

- 1. Determine population size and trends of the Galena Mountains herd, Wolf Mountains herd, and the Ray Mountains herd by 1995.

- 1a. Continue cooperative work with USFWS on Galena Mountains herd population dynamics and demographics study.
- 1b. Conduct photocensus of Ray Mountains herd in FY95.

White Mountains Caribou Herd (Subunit 25C)

Project Objectives and Activities:

- 1. Establish population and harvest objectives by 1993.
 - 1a. Conduct aerial surveys of the White Mountains herd to estimate population size, distribution, and population composition.
 - 1b. Evaluate the feasibility of allowing winter hunting of the White Mountains caribou by 1991.
 - 1c. Monitor anticipated increases in recreational use and mining development and ensure such development does not adversely affect the White Mountains herd.

Work Accomplished During the Project Segment Period:

- 1a. To estimate pregnancy rate, first age of reproduction and calf survival, BLM staff monitored calving during four flights in a PA-18 from 21 May - 10 June 1992. At least 7 of the 10 radiocollared cows calved. Five out of 7 cows calved first as 2 year olds. The peak of calving occurred between 20 May and 28 May.

To estimate population size, BLM staff completed a photocensus on 6 July 1992. They counted 832 caribou and located all the radiocollared caribou. The current estimate of herd size is 900-1,100 caribou.

To estimate composition, we surveyed the herd on 13 October 1992. We observed 247 caribou, including 23 calves:100 cows and 39 bulls:100 cows. The sample consisted of 14% calves and 24% bulls.
- 1b. Caribou harvest reports indicate that 114 people hunted during the fall general season in the White Mountains area. Only 15 hunters were successful. Seventy-six percent of these hunters were from the Fairbanks area.
- 1c. The 1992-93 reported harvest for caribou Drawing Hunts 577 and 578 included 3 caribou (2 cows, 1 bull). Two of the caribou were harvested during the

motorized season (577) and one during the non-motorized season (578). Only 22 of 100 permittees actually hunted; 16 during Hunt 577 and 6 during Hunt 578.

Progress Toward Meeting Project Objectives: The 1992 photocensus of the White Mountains herd provided a reasonable population estimate of 900 - 1,100 caribou. The ADF&G, in cooperation with the BLM, will continue to monitor the distribution, movements and reproductive rates of the radiocollared caribou in this herd.

The caribou harvest reports have not reflected a functional response in the increase of caribou hunters in connection with the closure of caribou hunting in many other areas in the Interior. From 1991 to 1992, the fall harvest decreased from 19 to 15 caribou and the number of hunters decreased from 162 to 114. Record snowfall and cold in September 1992 probably affected hunting pressure. The possible long-term loss of caribou hunting opportunity for some other Interior herds could still cause an increase in hunting pressure on the White Mountains herd.

The winter drawing hunt provides limited hunting opportunities without much impact (3 total caribou harvested) to the caribou herd. The Board of Game increased the number of permits available for each hunt (577 and 578) by 25, so now 150 permits will be issued, rather than 100. We should evaluate the information collected from the 1993-94 winter drawing hunt primarily to monitor participation. If participation continues to wain I think ADF&G should consider a limited registration hunt. This would allow sincere winter caribou hunters opportunity to hunt.

We recommend replacing Objective 1c with "Estimate harvest quotas for winter caribou Hunts 577 and 578 by 1994."

Porcupine and Central Arctic Caribou Herds (Subunits 26B and 26C)

Project Objectives and Activities:

1. Maintain minimum population size of 135,000 in the Porcupine caribou herd and 10,000 in the Central Arctic caribou herd.
 - 1a. Monitor the harvest through field observations, hunter reports, and contact with residents.
 - 1b. Coordinate data collection with Research Projects 3.34 and 3.35.
 - 1c. Conduct censuses and sex and age composition counts.

Work Accomplished During the Project Segment Period:

- 1a. Reports submitted by nonsubsistence hunters provided most of the data on harvest in Alaska, and harvest reports are being compiled. Subsistence harvest data were gathered opportunistically during visits to local communities.
- 1b. Major activities relating to the Porcupine herd included conducting a photocensus in July 1992, composition counts in July 1992 and March 1993, and monitoring movements, productivity, mortality, and seasonal distribution based on observations of radio-collared caribou. This herd appears to have declined from 178,000 in 1989 to about 160,000 in 1992. However, calf production and survival continue to be generally good.
- 1c. We conducted a photocensus of the Central Arctic herd in July 1992, we estimate about 23,000 caribou in the herd. We did fall composition counts and early summer calving surveys were done by monitoring radio-collared caribou. The Central Arctic herd is stable or increasing slowly. Harvest has increased in recent years but is still well within a sustainable level.

Progress Toward Meeting Project Objectives: The population objectives for the Porcupine and Central Arctic herds continue to be met with both herds exceeding minimum population levels. Harvest monitoring goals are also being met.

In view of the favorable status of the Porcupine and Central Arctic caribou herds, the existing management objectives appear to be suitable.

Segment Period Project Costs:

	<u>Personnel</u>	<u>Operating</u>	<u>Total</u>
Planned	66.7	36.5	103.2
Actual	71.9	70.9	142.8
Difference	- 5.2	- 34.4	- 39.6

Explanation: Severe declines in Central Alaska Range caribou populations necessitated reprogramming of personnel and operational funds to complete additional surveys and habitat work in the Chisana, Delta, and Fortymile herds.

Submitted by:

Kenton P. Taylor
Regional Management Coordinator

Project Title: Western and Arctic Alaska Caribou Survey and Inventory

Project Location: Unit 18 (42,000 mi²)
Kilbuck Mountains Caribou Herd

Project Objectives:

1. Allow for continued growth of the caribou population in Unit 18 from the current estimate of 2,500 to 10,000 caribou.
 - 1a. Estimate herd size and demography of caribou in the Kilbuck Mountains in the southern portion of the unit.
 - 1b. Determine the extent of movement and distribution of the Kilbuck herd and overlap with the nearby Mulchatna herd.
 - 1c. Allow a maximum harvest of 5% of the Kilbuck herd by registration permit (bull-only) until the herd reaches a size of 3,000 caribou.
2. Reduce the magnitude of illegal harvest of caribou occurring in Unit 18.
3. Finalize the Kilbuck Caribou Herd Management Plan in cooperation with the public and other agencies.

Work Accomplished During the Project Segment Period: The demography of the Kilbuck caribou herd was monitored in an area approximately 6,400 mi² in size in the southern portion of Unit 18. A cooperative study conducted by staff from the Yukon Delta National Wildlife Refuge and the ADF&G since 1986 continued during this report period. We conducted radiotelemetry and survey flights at periodic intervals to monitor distribution, calving success, recruitment, and population size.

The overall herd size has been estimated using composition and census data collected during late fall/early winter surveys when the animals became aggregated. During a census conducted during November 1991, we estimated that the herd contained 2,582 caribou. The fall/winter census for 1992 was not completed because of weather and aircraft availability. However, we did complete a composition count. The composition of 1,007 caribou during 31 October 1992 was 480 bulls, 416 cows, and 111 calves. During the caribou calving survey conducted during 1-4 June 1993, we observed 50 calves: 100 cows, with 18% calves overall from a sample of 1,207 caribou.

Observations of caribou movements and distribution were made at periodic intervals during the winter, spring calving, summer, and the fall rutting period. From this movement data, we documented some overlap between the range of the Mulchatna herd

and the Kilbuck herd. An additional 8 yearling female caribou were affixed with radio collars during fall 1992 to replace those lost because of mortality and/or low battery life. All radiotelemetry information still indicates that most Kilbuck caribou use a discreet calving area and have a high fidelity to their present range.

During the fall 1992 season, we issued 260 registration permits to hunters, and a harvest of 24 bull caribou was reported. During the Federal subsistence seasons (15 December 1992 - 9 January 1993 and 23 February 1993 - 15 March 1993), 144 federal subsistence permits were issued to residents of 18 villages (8 per village). The preliminary reported harvest from this hunt is 22 male caribou.

Increased enforcement efforts, especially during the hunting season by the State Fish and Wildlife Protection, occurred during the regulatory year.

Since the first Kilbuck Caribou management planning meeting held on 17 December 1991, a final version of the plan was approved by AVCP, FWS, and the ADF&G in March 1993. The plan's goals and objectives aim to allow the herd to continue to grow, while allowing a limited harvest by subsistence hunters. Public meetings have been held with the public, USFWS, and AVCP.

Progress Towards Meeting Project Objectives: The Kilbuck caribou herd has dramatically increased from an estimate of less than 1,000 animals in 1985 to present estimated population of 2,600 animals.

The combined reported harvest of 46 caribou during the state and federal hunts was below the 5% quota of the total estimated herd size mandated by the Management Plan.

The incidence of illegal harvest is still a problem in the eastern portion of the herd's range. Increased enforcement efforts should help us to better document this harvest.

Increased support by the village governments and other agencies with respect to caribou management in the Kilbuck Mountains has been greatly enhanced through the cooperative management planning process.

Project Location: Units 21D, 22, 23, 24, and 26A
Western Arctic Caribou Herd

Project Objectives:

1. Maintain a minimum population size of 200,000 caribou or larger.
 - 1a. Conduct a biennial photocensus to estimate population size.

- 1b. Conduct periodic radio-tracking flights to monitor herd distribution.
- 1c. Maintain a sample size of at least 100 operational radio collars.
- 1d. Conduct aerial surveys during early April to assess short yearling recruitment.
- 1e. Conduct aerial surveys during early June to monitor calving success.
- 1f. Monitor hunting and other mortality factors through harvest reporting, collection of biological specimens, public contacts, and unreported harvests.
- 1g. Improve communication with the public to reduce the magnitude of unreported harvests.
2. Minimize conflicts between caribou and the reindeer herding industry.
 - 2a. Conduct mid-winter surveys to monitor caribou distribution near reindeer herds.
3. Minimize conflicts with industrial development.
 - 3a. Monitor the distribution and movements of caribou near major industrial developments to assess impacts.
4. Develop updated population objectives in cooperation with the public and other agencies.

Work Accomplished During the Project Segment Period: During September 1992, 41 caribou from the Western Arctic caribou herd (WACH) were instrumented with radio collars near Onion Portage on the Kobuk River. We outfitted 38 caribou with conventional VHF collars and 3 animals outfitted with satellite collars (PTTs). The ADF&G and North Slope Borough staff instrumented 2 additional caribou with PTTs near Anaktuvuk Pass. We were able to maintain a minimum of 100 active radio collars and 5 PTTs on WACH animals during the report period. Two caribou outfitted with PTTs died during early spring 1993.

During the winter from October 1992 through April 1993, 10 telemetry distribution flights were conducted by staff from our Nome, Kotzebue, Fairbanks, and Barrow offices. We conducted the flights in Units 21D, 23, 24, 26A, and near eastern Norton Sound in Unit 22. We monitored the status of 140 radio collared caribou during these flights.

The field work portion of a photocensus of the WACH was completed during June and July 1993. The work of counting the photographs is still in progress.

We conducted aerial recruitment surveys in Unit 23 when caribou were migrating north to calving grounds during late April and early May 1993. To better distribute the sampling effort, radio-collared animals were relocated, and composition was determined for up to 200 animals in the immediate vicinity of the collared animal. We sampled 47 groups containing radio-collared animals, and we counted over 6,200 caribou yielding a recruitment ratio of 18 short yearlings:100 adults.

Calving ground surveys were completed during early June 1991 near the Utukok River and Lisburne Peninsula. In an effort to objectively distribute sampling effort, composition was conducted near radio-collared cows. We found a ratio of 30 calves:100 adults.

Harvest was determined using the WACH reporting system for local residents, and the statewide harvest ticket system for nonlocal residents and nonresidents. During the 1992-93 hunting season, hunters reported a harvest of 2,111 caribou. Of the total, 108 caribou were taken by nonresidents; 394 by nonlocal Alaska residents; and 1,602 by local hunters residing in Units 21D, 22, 23, 24, and 26A. Seven caribou were reported by hunters who did not report their residency. Harvest reporting by local residents is still in progress, and the harvests reported above should be regarded as preliminary. Because harvest reporting rates among local hunters is often poor, we believe the actual harvest is substantially higher than reported.

Progress Towards Meeting Project Objectives: We were able to maintain a minimum sample size of 100 radio-collared caribou in the WACH during the report period. However, we should consider increasing the sample size because the herd has grown considerably in size during the last 5 years, and is currently estimated to exceed 415,000 caribou. The goal of maintaining a sample size of 100 active collared animals was developed a number of years ago when the herd was substantially smaller in size.

Aerial radiotelemetry and distribution surveys indicated that large numbers of caribou wintered south of the Selawik Hills in and adjacent to reindeer ranges, and substantial losses of reindeer were reported. Additional survey flights in and adjacent to reindeer ranges may be warranted in the future to warn herders of impending movements of caribou that may affect them.

The short yearling surveys conducted during late April and early May 1992 indicated that the recruitment rate of 18 short yearlings:100 adults was within the range of recruitment observed during recent years. Since 1986, recruitment has ranged from 18-27 short yearlings:100 adults.

Because of conflicting project priorities in Nome and Kotzebue, we were not able to conduct as much information/education work as planned. Improving the public's

understanding of regulations and the need for better harvest reporting are 2 goals of our information/education program. The public contacts gained by information/education activities provides our staff with needed input on the caribou management program we have in place.

If the WACH continues to grow in size, the biennial photocensus may become more difficult to complete. During the 1990 photocensus, the entire post-calving group did not aggregate at the same time. Aggregations took place over the course of several days, and mixing of animals from different aggregations may prove more of a problem in future photocensuses if the herd continues to grow in size. Estimating the population size through a sampling procedure rather than a complete count of post-calving aggregations may be necessary in the future.

Project Location: Subunit 26A (53,000 mi²)
Teshekpuk Lake Caribou Herd

Project Objectives:

1. Maintain a stable or increasing population for the Teshekpuk Lake Caribou Herd (TLCH) and provide for hunting on a sustained yield basis.
 - 1a. Determine the herd population size every 2-3 years.
 - 1b. Determine the percentage of calves surviving their first winter.
 - 1c. Delineate the calving grounds each year.
 - 1d. Identify and map the herd's movements and distribution throughout the year, using survey and radiotelemetry data.
 - 1e. Develop a system to capture caribou without the use of drugs.
 - 1f. Encourage local participation in research and management decisions.
 - 1g. Determine the extent of the harvest using methods that are acceptable to hunters as well as the participating agencies.
 - 1h. Determine sources of significant, non-hunter mortality.
2. Provide educational opportunities for students and other members of the public.
3. Minimize conflicts with industrial development.

- 3a. Monitor the distribution and movements of caribou near areas of potential industrial development to assess impacts using satellite and VHF radio collars.
- 3b. Define critical caribou habitat areas such as calving, insect relief, and wintering areas in Subunit 26A by flying surveys and monitoring satellite collars during the appropriate times.
- 4. Develop updated management objectives in cooperation with the public and other agencies.

Work Accomplished During the Project Segment Period: Through a cooperative project with the North Slope Borough Department of Wildlife Management and the U. S. Bureau of Land Management, 11 caribou were captured using a Hughes 500 helicopter equipped with a skid-mounted net gun during July 1992. Satellite radio collars were attached to 6 caribou and standard VHF collars were attached to 5 caribou to aid in population, productivity, and movement studies. These caribou were measured and weighed, and body condition was assessed.

We conducted a survey to evaluate calving success on 19 July 1992. We observed 3,047 caribou from a Hughes 500 helicopter, resulting in a count of 80 calves:100 cows and 93 bulls:100 cows.

We monitored movements of the 6 satellite collared caribou throughout the year. Four animals remained in the area east of Teshekpuk Lake and 2 traveled to the northern foothills of the Brooks Mountain Range. Five of the 6 satellite collared caribou died during winter.

Short yearling composition surveys were conducted from 22 April-3 May. We observed 22 short yearlings:100 adults during surveys. Of the caribou which were collared, 36% died during the 1992-93 winter, compared to an average of 10% for winter mortality during previous years. We conducted calving surveys on 5-18 June 1993. We used telemetry equipment and a GPS receiver to determine the calving locations of collared cows. Calving occurred much later than observed during previous years. Most of the calving occurred after 12 June and continued past 18 June in 1993, while in previous years most calving had occurred by the first week in June. Calving success was very low. We observed 30 calves:100 adults where in past years we have observed over 70 calves:100 adults.

We conducted a photocensus of the TLCH during July 1992. However, some of the film was lost during the processing, and we will attempt another census during 1993.

Progress Towards Meeting Project Objectives: Nearly all management objectives were met. Photos were taken for a census, summer and spring composition counts were completed, and caribou were captured and collars attached without using drugs. Collared caribou were relocated several times during the year, calving surveys were conducted, carcasses were examined to try to determine causes of over-winter mortality, and detailed movement information was obtained from the satellite radio collars deployed on TLCH caribou. We will continue to monitor caribou movements and use this information to protect critical habitat areas from the impact of industrial exploration and development.

Students from North Slope schools were given educational opportunities for learning about research techniques for monitoring caribou populations and movements. Barrow, Nuiqsut, and Anaktuvuk Pass students assisted us in capturing and attaching satellite radio collars to caribou. They used caribou locations to plot movements of the animals through fall and winter.

We examined results of subsistence harvest and radio-tracking studies to estimate how many caribou were harvested from the TLCH during 1990-91. By examining the number of caribou harvested by various villages and assessing the distribution of caribou from the TLH at the time of these harvests, we estimated that 900-1,525 TLH caribou were harvested. Good harvest information was not available this year but the harvest effort appeared similar to 1990-91.

With the occurrence of high overwinter mortality and poor calving success, the TLCH may have decreased in number during the 1992-93 winter. Research efforts should continue at the present level or increase to determine the status of the herd.

Segment Period Project Costs:

	<u>Personnel</u>	<u>Operating</u>	<u>Total</u>
Planned	141.6	85.1	226.7
Actual	141.6	98.1	239.7
Difference	0	13.0	13.0

Explanation: Because the Teshekpuk census was unsuccessful during 1992, we conducted the census again during 1993. Costs for short yearling surveys of the WAH were higher than expected because state-owned aircraft were not available for use.

Submitted by:

Steve Machida
Survey-Inventory Coordinator

Federal Aid in Wildlife Restoration

The Federal Aid in Wildlife Restoration Program consists of funds from a 10% to 11% manufacturer's excise tax collected from the sales of handguns, sporting rifles, shotguns, ammunition, and archery equipment. The Federal Aid program then allots the funds back to states through a for-

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ment of Fish and Game uses the funds to help restore, conserve, manage, and enhance wild birds and mammals for the public benefit. These funds are also used to educate hunters to develop the skills, knowledge, and attitudes necessary to be reponsible hunters. Seventy-five percent of the funds for this project are from Federal Aid.

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Alaska's Game Management Units

