Alaska Department of Fish and Game
Division of Wildlife Conservation

Federal Aid in Wildlife Restoration
Annual Performance Report
Survey-Inventory Activities
1 July 1997 - 30 June 1998

CARIBOU

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Whitten

Grant W-27-1
Study 3.0
October 1998

STATE OF ALASKA
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DEPARTMENT OF FISH AND GAME
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DIVISION OF WILDLIFE CONSERVATION
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Project Title: **Southcentral Alaska Caribou Management**

Project Location: Unit 7 (3,520 mi^2)
Kenai Mountains Herd

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

Work Accomplished During the Project Segment Period: On 27 February 1998, we completed an aerial survey for the Kenai Mountains caribou herd. The survey was conducted using a Piper PA-18 Super Cub. A total of 419 caribou were observed but not classified because we used a fixed-wing aircraft. The 1997–98 estimate places the herd's postcalving population size at 500 caribou, 50 less animals than last year. The previous complete sex and age composition survey was conducted on 14 March 1996. Using a Bell 206B Jet Ranger, we classified 403 animals, yielding the following results: 237 (59%) cows, 97 ((24%) bulls, and 69 (17%) calves. Ratios were 41 bulls and 29 calves per 100 cows. Calves composed 17 percent of all caribou classified.

We received 876 applications for 250 permits issued to hunt either-sex caribou during 1997. Twenty-seven (11%) hunters reported hunting successfully, 92 (37%) unsuccessfully, and 131 (52%) did not hunt. The reported harvest comprised 12 (46%) males, 14 (54%) females, and caribou of unreported sex. Successful hunters used various transportation methods to access their hunting area: highway vehicles 19 (70%), horses 6 (22%), and aircraft 2 (7%). Fifteen (56%) animals were taken in August and 12 (44%) in September. In 1997 the Board of Game extended the season to include a November 10 to December 10 hunt. Ten hunters hunted from December 1 to 10 when snowmachine access was allowed, but no caribou were killed. Twenty-six (96%) of the 27 successful hunters were state residents.

Progress Meeting Project Objectives: In an attempt to reduce herd size, the harvest of 27 caribou during 1997 from an estimated herd of at least 500 is insignificant. Surveys in 1992, 1997, and 1998 indicate the herd increased from approximately 405 to 550 animals (26%) then declined to 500 in 1998. The history of this herd indicates that when the herd exceeds 450 animals, it declines sharply to about 300. I recommend the number of permits be maintained at 250 and the season increased for the 1999 season to start reducing herd size. If the 1998 harvest fails to sufficiently reduce the herd's size and the herd does not decline naturally, a change in season and bag limit to promote harvest of adult females should be implemented for the 1999 season.

Project Location: Unit 15A (1,300 mi^2)
Kenai Lowlands Herd

Project Objectives: To increase the herd to a minimum of 150 animals by 1998.

Work Accomplished During the Project Segment Period: An aerial survey on 16 June 1998 found a minimum of 124 caribou, including 30 (24%) calves, in the herd. Of the 124 caribou, 94

were adults; we counted 81 adults in 1997. Because we used a fixed-wing aircraft, an accurate assessment of yearlings was not possible, but we frequently observed yearlings. The observation of 30 calves is the highest number ever found in the Kenai Lowlands herd. On 19 June 1997 we counted 98 caribou (17% calves).

Progress Meeting Project Objectives: Adult animals in the Kenai Lowlands herd increased 14%, while the number of calves increased 43% from 1997. Total animals observed continues to indicate a steady increase in population size, in spite of the severe winter of 1994–95. The observation of 62 adults in 1994, 65 in 1995, 69 in 1996, 81 in 1997, and 94 in 1998 is still well below the 105 adults counted in 1989. Low recruitment due to predation rather than habitat limitations is still suspected to be the cause of the herd's small size. The season has been closed since 1993 and should remain closed until the herd size reaches the management objective of 150 caribou. We postponed rewriting management objectives until year 2000.

Project Location: Units 15B and 15C (3,563 mi^2)
Killey and Fox River Herds

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

Work Accomplished During the Project Segment Period: In spring the U.S. Fish and Wildlife Service (FWS) surveyed the 3 caribou herds resulting from the 1985 and 1986 reintroductions. FWS conducted these surveys as part of an agreement with the state in the Kenai Peninsula Caribou Management Plan. Search efforts included most of the known ranges for these herds. On January 13, 1998 the Killey River and Twin Lakes herds were counted, resulting in the following totals: Killey River-340 and Twin Lakes-66. The Fox River herd was counted on March 11, 1998 and 96 caribou were found. These totals compare to 376, 73, and 81, respectively, found in these herds last year. Complete composition data was not collected because the survey was conducted using a fixed-wing aircraft. The four original releases totaled 80 animals.

Hunting was authorized on the Killey River herd beginning in 1994. We issued 25 permits each year with a bag limit of 1 caribou until 1996. In 1997 the number of permits issued was increased to 50 with the same bag limit. We received 269 applications for these permits, and 27 permit holders reported hunting, harvesting 23 bulls (85%). Successful hunters averaged 4.5 days afield and 20 (87%) of the 23 successful hunters were residents. Successful hunters used various modes of transportation: 16 (70%) used horses, 5 (22%) used boats, and 2 (9%) used aircraft.

Hunting began on Fox River herd in 1995 when we issued 15 permits. The number of permits issued was reduced to 10 in 1996 and remained the same through 1997. We received 123 applications for these permits. Four of the 10 permit winners reported hunting, harvesting 2 bulls. Successful hunters averaged 5.0 days afield and both were residents.

Twin Lakes herd was not hunted during this reporting period.

Progress Meeting Project Objectives: The management objective of reestablishing viable caribou populations in suitable habitat in Units 15B and 15C has been achieved. Results from 1998 surveys, compared to 1997, indicate Killey River and Twin Lakes herds may have declined while the Fox River herd increased. Quality and quantity of habitat in the Fox River's range may becoming a limiting factor since the density of the herd is about 1 caribou per 1000 m^2. The minimum late winter 1997–98 population size of these 3 caribou herds was 502 caribou, compared to 530 the previous year.

The Killey River herd was opened to hunting during the spring 1994 Board of Game meeting, allowing for 25 permits to be issued in the fall of 1994 to 1996 and 50 permits in 1997. The Fox River herd was opened in 1995, allowing for 15 permits in 1995 and 10 in 1996 and 1997. The Twin Lakes herd is increasing; however, it is still too small to support additional mortality through hunting and continue to increase.

Preliminary results from radiotracking indicate animals are exchanging between the Twin Lakes and Killey River herds; the extent of exchange is unknown.

Project Location: Units 9A, 9B, 9C, 17 and 19B (45,500 mi^2)
Mulchatna 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: Harvest reports for this reporting period have not been analyzed. Hunting effort was probably comparable to recent years.

During the 1997–98 season 1 emergency order was issued to open hunting season on the Mulchatna caribou herd (MCH) which were moving into closed areas. Unit 18 (south of the Yukon) and Unit 17A (west of the Togiak River and north of Pungokepuk Creek) were opened from August 25 to March 31 with a bag limit of 5 caribou.

Regulations were changed at the spring 1998 Board of Game meeting to require that all meat on caribou taken in Unit 17 before October 1 must remain on the bones of the front quarters and hindquarters until removed from the field or processed for human consumption.

A scheduled photocensus of the MCH was not conducted. Though unable to quantify total herd size, the high proportion of calves and large number of caribou observed do not indicate any significant decline in herd size. Herd size is still estimated to be at least 200,000. No fall composition counts were conducted during this reporting period.

Herd movement for these caribou continues to be unpredictable. In July 1997 large numbers of caribou were located in the upper drainages of the Koktuli and Stuyahok rivers. By mid-August most had moved into the Nushagak Hills, with large numbers traveling northwest into the Aniak River drainage. In early September, radiocollared caribou were located throughout northern Unit 9A, 17B, and western Unit 18. Because of the dry conditions and low insect harassment, many of

the caribou stayed in the lowlands. During the rut in early to mid October, large numbers were located between Kemuk Mountain on the boundary between Units 17B and 17C, and Levelock, on the Kvichak River. Additional caribou were in the Nushagak Hills and Hoholitna drainage. In late December and early January, large numbers were located in the Mulchatna drainage, with scattered groups of caribou throughout Units 9B, 17B and southern 19B. Caribou were also located near Whitefish Lake (near Aniak).

A May 21 calving survey revealed very low (12.7 calves:100 cows) calf numbers in the head waters of the Nuyakuk, Tikchik, Klutuspak, and King Salmon Rivers. Observation during subsequent radiotracking flights indicated a much higher (though not quantified) proportion of calves. A noticeable variation in calf size and coloration was observed, perhaps indicating a late and prolonged calving period.

In late June large numbers of caribou were moving from the calving areas through the Shotgun Hills, Nushagak Hills, and Mosquito River area. By early July 1998, they were concentrated near Snipe, Turquoise, and Telaquana Lakes of the upper Mulchatna drainage.

Caribou translocated from the Alaska Peninsula to the Nushagak Peninsula in 1987 remained stable in number during this reporting period at about 1300 animals. Monthly radiotracking flights verified that most of the herd remained on the Nushagak Peninsula. Data from the Federal Subsistence hunt are still being analyzed.

Progress Meeting Project Objectives: The MCH herd size probably grew since the herd continued to utilize more land. No range investigations have been conducted in areas used by this herd. Trailing is extensive within the range of the herd, but there is no evidence to suggest that food availability is limiting herd growth. Liberalization of hunting regulations and publicity about the size and health of the herd are increasing hunting effort.

Project Location: Units 9C and 9E (24,000 mi^2)
Northern Alaska Peninsula Herd

Project Objectives: To maintain the population at 15,000 to 20,000 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 1997 and classified 1064 caribou. Ratios were 46.7 bulls and 27 calves per 100 cows. Calves composed 15.5% of the fall sample, compared to 23.8% of the caribou counted in 1997 postcalving aggregations.

A cooperative postcalving count was conducted in June 1998, and preliminary estimates totaled 9200 caribou, including 2800 counted by the FWS in the Aleutian Mountains and on the Pacific Coast. Calves composed 24.4% of the total count.

Hunters reported killing 421 bulls and 32 cows during the 1997–98 season. Hunter success was 77%, below the long-term average. Chronology of the harvest by month was as follows: July-1;

Aug-48; Sep-226; Oct-104; Nov-4; Dec-23; Jan-18; Feb-20; Mar-10; and Apr-0. Local residents, other Alaskans, and nonresidents accounted for 9%, 25%, and 66%, respectively, of successful hunters reporting. The 1997–98 reported harvest was similar to 1994–95 and 1995–96, and all were about 60% below the 1993–94 record harvest. We estimated the unreported sport and subsistence harvest at 200 and 850, respectively, resulting in a total harvest estimate of 1500. Unlike herd movement in 1995–96, several thousand Mulchatna caribou moved into Units 9C or 9E during winter 1997–98, and an unknown proportion of the winter harvest in the Naknek drainage was of Mulchatna herd animals.

In fall 1997 we collected 10 female calves to assess body condition and look for evidence of lungworms. All calves tested positive for lungworms.

In 1998 we conducted a calf mortality study with major funding from the US Fish and Wildlife Service. We captured and radiocollared 39, 1–2-day-old calves, and we monitored them daily through 12 June and periodically through the end of June. Overall survival through the end of June was 35%. Most mortality during June was caused by predators and later in the month by respiratory disease.

Progress Meeting Project Objectives: Population estimates from 1991–93 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 keeping the NAP herd within the population objective the past 10 years while maintaining the desired sex ratio. Changes in the herd's distribution have led to an increased winter harvest, when caribou are accessible along the Naknek/King Salmon road system. We viewed this increased harvest, especially of females, as a positive development in maintaining the herd closer to the lower end of the population objective.

Results of the 1994 postcalving census showed a decline in herd size of approximately 25%, which coincided with a high rate of natural mortality to radiocollared cows. Results of the 1997 and 1998 postcalving counts indicate the herd did not stabilize and the decline has continued. Hunting restrictions implemented during the 1994–95 season reduced harvests, and natural mortality during this reporting period also decreased. The herd, however, continues to decline and more reductions in harvest are required at this time to curtail the decline.

Project Location: Unit 9D and Unit 10 (4,900 mi^2)
Southern Alaska Peninsula Herd

Project Objectives: To maintain the population between 4000–5000 midsummer with an October sex ratio of 2040 bulls:100 cows.

Work Accomplished During the Project Segment Period: During 9–11 July 1997 a cooperative joint survey with the FWS expanded upon a postcalving aggregation done the previous month. During this second survey, we located all 22 functioning radio collars and visually estimated 1557 caribou. Combining the 29 June with animals seen during 9–11 July outside the core area, a minimum population total is 1844 with 15% calves. On 12 July we surveyed the northern side of Unimak Island and counted 99 adults and 41 calves.

During 3–4 October 1997 a helicopter survey classified 686 caribou in Unit 9D and documented ratios of 19 calves and 41.7 bulls:100 cows.

Based on the FWS survey during April 1997, a federal subsistence hunt was held with a quota of 60 bulls on Unimak Island and 100 bulls in 9D. Preliminary reported harvests were 6 on Unimak and 25 in 9D, excluding suspected unreported harvest.

Progress Meeting Project Objectives: The SAP herd has been below the population objective for several years; given the poor range conditions documented through other research, the available habitat may not be able to sustain the original population objective of 5000–6000 caribou. Consequently, a new cooperative management plan between the department and Izembek National Wildlife Refuge was adopted in 1994. The new population objectives are outlined above.

Recent research has tentatively identified nutritional stress as the primary factor causing poor body condition, high natural mortality rates, and low productivity among these animals.

Hunting was closed by emergency order in 1993 when the herd was documented below 2500 animals and should remain closed until the herd exceeds that number. Although caribou are in better physical condition now, and the Unimak segment is clearly showing good productivity, recruitment and adult female mortality in Unit 9D indicate population growth is unlikely. The results of the FWS April 1997 survey in Unit 9D are not easily explained. A subsistence hunt on Unimak Island is now justified to prevent rapid population growth that could exceed the carrying capacity of the island. Hunting in 9D should not be imposed until another winter survey and/or data on recruitment and survival substantiate the herd is starting to recover.

Project Location: Unit 13 (25,000 mi^2)
Nelchina Herd

Project Objectives: To stabilize the herd between 35–40,000 animals with a minimum bull:cow ratio of 40:100 by harvesting the annual growth increment; to maintain productivity rates at approximately 10%; to maintain animal growth and body condition parameters near current parameters and those of other caribou herds of Interior Alaska.

Work Accomplished During the Project Segment Period: The October 1997 postrut estimate for the Nelchina herd was 31,893 caribou, of which 26,438 were adults (>1 yr). The estimate was extrapolated from a June 1997 postcalving aerial count of 34,894 animals (63% cows) and the September 1997 sex and age survey which tallied 26 bulls:100 cows and 26 calves:100 cows. The June 1998 total postcalving spring aggregate count was 44,192 caribou. The 1998 postcalving composition count was 54 calves:100 cows.

Two Nelchina caribou state hunts were held during 1998 in Unit 13. The state hunts comprised a Tier II subsistence permit hunt with 10,000 permits issued for bulls only and a Tier I subsistence hunt for cows and small bulls with 25,376 permits issued. The Tier II hunt permits were issued to the applicants with the highest eligibility score. The Tier I hunt was a registration hunt, and state

residents could receive registration subsistence permits by mail. The harvest under the Tier II hunt was 2078 bulls. The Tier I harvest was 1151 cows and 438 small bulls. The Tier I hunt was closed by emergency order after the fall season, but this closure had little effect on the herd because most caribou left the unit before the winter season. The Tier II winter season was closed by emergency order in Unit 13E to protect the Upper Susitna subherd. The combined harvest for both state subsistence hunts was 3698 caribou (2516 males, 1153 females, and 29 sex-unknown animals.

The Bureau of Land Management conducted a fall and winter federal registration hunt in Unit 13 on their lands along the Denali and Richardson Highways. Each hunter was allowed 2 permits (2-caribou bag limit), and 1618 permits were issued for the federal hunt. The federal harvest was 164 (105 bulls, 58 cows, 1 sex unknown). This year's federal harvest was about 50 animals below last year's take and well below the 1991 harvest of 647 caribou. The reasons for the harvest declines are that less land is open for federal hunting because of state land selections along the Denali Highway and caribou spend less time on the few federal lands that remain open.

The Nelchina Caribou herd spent May through July 1997 in the eastern Talkeetnas. Weather conditions in 1997 were much more favorable than in 1996 as the summer was wetter, increasing forage production. During fall 1997 the herd was in interior portions of Unit 13 west of the Richardson Highway and south of the Denali, limiting hunter success from the highway system. Radiocollared caribou distribution was within a band extending from the eastern Talkeetnas across the Lake Louise Flats south of the Alphabet Hills to the Gulkana River. The herd was split into 3 large groups by late fall and the rut occurred in 3 areas: the Little Nelchina River, Kosina Creek, and Watana Creek. In late October and November 1997, the caribou herd moved east along the usual migration route across Unit 13 into Unit 11 and Unit 12. Virtually the entire Nelchina herd left Unit 13 during the winter migration of 1997–98. Caribou wintered in Units 12 and 20E. Weather conditions on the winter range were especially favorable with only a moderate snow pack and relatively mild temperatures all winter. Caribou did not begin moving back into Units 13C and 11 until late spring. Distribution during calving in 1998 was a little different in that a larger number of cows calved in the Little Nelchina River, further south than the usual calving area between the Big Oshetna River and Kosina Creek. The postcalving aggregations were located west of the Kosina during the spring 1998 census.

We monitored caribou calving by scheduling flights every other day, weather permitting, from 18 May–28 May. We tracked and observed radiocollared adults during each flight until we determined the cows had calved. In the absence of a calf, a cow with retained antlers and a distended udder was considered with calf. Neonatal calves (n = 60) were captured on May 25 during the peak of calving to obtain birth weights. Weather conditions were poor throughout the calving period with cold, windy, wet weather predominating. In addition, snow cover remained 3 weeks longer than usual on the calving grounds, resulting in calves being dropped in areas with over 50% snow cover.

Body condition was monitored twice in female calves, once during September 1997 and again in April 1998. After capture, we weighed caribou and recorded body condition parameters, and compared data with similar data from past years in the Nelchina herd. Comparisons of weights and condition indices were also available between other interior caribou herds.

Progress Meeting the Project Objectives: The 1997 fall population estimate for the Nelchina herd declined by 12,000 animals and was well below the herd management goal of 35–40,000 caribou in the fall. Much of this decline was attributed to poor calf production in 1997 with 5000 fewer calves born than in 1996. This poor calf production was attributed to a drought in 1996 that reduced available forage. Cows that are stressed on summer range are much less likely to have a calf the following year. Also contributing to the decline was an increased winter mortality rate in the Nelchina herd during 1996–97, indicated by a 15% overwinter loss of radiocollared cows. The reason for this apparent 1-year increase in natural mortality is unknown.

The spring 1998 fixed-wing census was approximately 9000 caribou above last year's count. Composition data indicate calf production in 1998 was much higher than in 1997, with over 6000 more calves born this year than last. The increase in calf production was attributed, in part, to better forage conditions because the summer of 1997 was much wetter. However, comparing the results of the 1998 census to the fall 1997 extrapolated population estimate, we conclude the 1997 spring count probably was around 5% low.

Body condition parameters collected in the Nelchina Caribou herd increased in 1997. Body weights for female calves were approximately 16 pounds higher in fall 1997 than in fall 1996. Body weights for female calves in April 1998 were the same as fall 1997 weights, indicating summer forage was either of higher quality or more available than in 1996 and the winter of 1997–98 was relatively mild on caribou. The peak of calving for radiocollared cows was 26 May, 1 day later than last year's peak. Historically the peak of calving for the Nelchina herd is always later than observed in adjacent interior herds. Neonatal calf weights this year in the Nelchina caribou herd were the heaviest observed in 3 years, even higher than for calves in adjacent interior herds other than the Denali. Later calving dates and lower neonatal calf and short yearling weights observed previously in the Nelchina herd indicate animals in the herd are at a lower nutritional level than animals in adjacent interior herds. Increases in body condition parameters during 1997–98 were probably due to both favorable weather conditions that increased the quantity and quality of forage available and a decline in the amount of energy expended during the winter. The annual (spring census 1997–spring census 1998) mortality rate for radiocollared caribou was 5%, a decrease from the 15% from last year.

Recommendation: The harvest quota for 1998 is 2500 bulls and 1000 cows. Because cows can be taken only under an unlimited Tier I hunt, hunter pressure would be too great for the harvest quota of only 1000 cows to open this hunt. To harvest 2500 bulls, only 7000 Tier II permits should be issued.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	91.6	71.5	162.1
Actual	91.6	61.5	152.1
Difference	0.0	10.0[a]	10.0

[a]Because of unfavorable weather, we did not conduct a planned photocensus of the Mulchatna caribou herd.

Submitted by:

Michael G. McDonald
Assistant Management Coordinator

Project Title: **Interior Caribou Population and Habitat Management**

Project Location: Unit 12 (9,978 mi^2)
Chisana Caribou Herd

Project Objectives and Activities:

1. Maintain an October bull:cow ratio of at least 30:100
2. Conduct aerial surveys of the herd to determine size, trend, and productivity
3. Monitor mortality factors affecting the herd

Work Accomplished During the Project Segment Period: On 1 October 1997 we completed the Chisana herd sex and age composition survey. We classified 520 caribou as either female, calf, or bull. Bulls were further classified as either small, medium, or large, based on antler size. The calf:cow ratio was 14:100 and the bull:cow ratio was 24:100. Compared to the previous past 9 years, this was the highest calf recruitment (0–11:100; $\bar{x}$ = 5:100; s = 5). Between 1992 and 1996, the proportion of bulls in the population declined from 31:100 cows to 17:100 cows primarily due to low calf recruitment and high adult mortality. The 1997 bull:cow ratio was higher than expected for unknown reasons. The adjacent Mentasta herd also experienced poor calf recruitment for a number of years and its bull:cow ratio did not decline as expected. There was evidence of some exchange of Nelchina bulls to the Mentasta herd. There was little overlap between other herds and the Chisana herd, so we do not know if exchange caused the increase in the bull number. Based on composition and mortality data, we estimated 550 caribou in the fall 1997 population. The herd declined 70% since 1988.

Each year between 27 and 29 May, we survey radiocollared cows to determine pregnancy rate and incidence of early calf mortality. This year we did not get an estimate of pregnancy rate.

The late May estimated calf:cow ratio was 14:100, compared to ratios in 1997 (64:100), 1996 (36:100), 1995 (52:100) and 1994 (73:100). In 1997 the calf ratio declined to 14–16:100 cows by 10 July.

The fate of radiocollared caribou was monitored jointly with the National Park Service and the Yukon Department of Natural Resources. None of the radiocollared cows died between 28 May 1997 and 29 May 1998 (radiocollar sample 11–14 cows). During the previous 3 years, we estimated adult cow mortality rates using radio collars, modeling, and population census results. It was 20–29% annually. Even summer mortality was high during those years, averaging 14%. Wolves were responsible for 85% of the documented mortalities.

The bull/cow ratio declined below the minimum population objective during 1993–1994 and continued to decline through 1996. The season was closed in 1994 and will remain closed until the bull:cow ratio exceeds 30:100 cows and there is adequate calf recruitment.

Progress Meeting Project Objectives: The Chisana herd has been declining since 1988 due to low calf recruitment. Predation and poor range quality were the primary factors. Range quality was poor during the early 1990s because of unfavorable weather conditions. Between 1991 and

1993, harvest was reduced through either a voluntary agreement with principal hunters and guides or by a harvest quota regulated by a registration permit system. Under both systems, harvest did not affect herd growth although it did cause a decline in the bull:cow ratio because of low calf recruitment. In September 1994 caribou hunting within the Chisana caribou range was closed because the bull:cow ratio declined below 30 bulls:100 cows. Considering current herd trend and management options, I do not expect hunting will resume in the foreseeable future.

I recommend continuing the current harvest and population objectives.

Project Location: Units 19 and 21 (80,411 mi^2)
Big River, Rainy Pass, Beaver Mountains, Tonzona, and Sunshine Mountain Caribou Herds

Project Objectives and Activities:

1. Increase herd sizes:
   Big River Herd: 1500–2000
   Beaver Mountains Herd: 1200–1500
   Sunshine Mountain Herd: 1500–2000
   Tonzona Herd: 1800–2000
   Rainy Pass Herd: 1500–2000
2. Monitor mortality factors, including hunting, predation, and other factors.
3. Estimate status, trends, and productivity of the herds from aerial surveys.

Work Accomplished During the Project Segment Period: Preliminary analyses of harvest tickets returned by hunters indicated harvests of 2 in Unit 19A, 79 in Unit 19C, and 2 in Unit 19D. Additional caribou were reported taken from the Mulchatna Herd in Unit 19 and will be reported by the Dillingham Area Office. We collected no additional information on predation or other mortality factors. We also did not collect any information on size or status for any herd.

Progress Meeting Project Objectives: We did not met our herd objectives, based on 1997 estimates. Hunting mortality was insignificant, but populations declined based on our incidental observations. Suspected but undocumented wolf and bear predation kept these herds below their targeted levels. Meeting herd objectives will not be possible unless predation levels on these herds are reduced.

We did not meet our objective of monitoring mortality factors other than hunting. We also did not meet our population assessment objectives. A comprehensive survey plan should be formulated to annually assess the status of these small populations. We are developing plans for fall 1998 composition counts.

Project Location: Unit 20A (6,796 mi^2)
Delta Caribou Herd

Project Objectives and Activities:

1. Maintain a bull:cow ratio of at least 30:100 and a large bull:cow ratio of at least 6:100.
    - Conduct annual fall composition counts.
2. Reverse the decline of the herd and increase the midsummer population to 6000–8000 caribou.
    a. Conduct annual photocensus of the herd.
    b. 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."
    c. Reduce wolf predation on caribou by decreasing the wolf population.
    d. Implement a wolf control program.
3. Sustain an annual harvest of 300–500 caribou.
4. Gather information on predator:prey ratios and on the significance of predation and weather as natural mortality factors.

Work Accomplished During the Project Segment Period: We conducted a photocensus of the Delta herd during June 1997 and 1998. We completed composition surveys of the herd in October and May. We monitored effort and timing and distribution of harvests through drawing permit reports.

Progress Meeting Project Objectives: We completed all scheduled surveys under adequate conditions. We continued to gain ground on our bull:cow ratio objective, probably due to increased recruitment during the last few years. In addition, we continued to exceed our objective for large bulls:100 cows.

Improvement in large bull:100 cow ratios resulted in approval of a limited drawing hunt for bulls during the 1996–1997 and 1997–1998 regulatory years. Although far from our harvest objectives, 25–35 caribou were taken by 75 permit holders.

Wolf control efforts were suspended in 1994. We made very modest progress meeting herd size objectives. We initiated a research project to evaluate the efficacy of diversionary feeding to reduce wolf predation on calves.

We do not recommend any changes in objectives at this time. The population and harvest objectives listed above are part of regulations for implementation of wolf predation control plans.

Project Location: Unit 20D (5,633 mi^2)
Macomb Caribou Herd

Project Objectives and Activities:

1. Increase the size of the Macomb caribou herd to 600–800 caribou, with an annual harvest of 30–50 caribou per year by the year 2002.
   a. Conduct aerial census of the herd to determine size, trend, and productivity
   b. Monitor mortality factors affecting the herd
   c. Monitor the limited permit hunt

Work Accomplished During the Project Segment Period: An aerial census and composition survey was conducted on 28 October 1997. Composition data was collected from a sample of 451 caribou and resulted in estimates of 18 calves:100 cows and 28 bulls:100 cows. Because the census was not completed, population modeling was used to estimate a population of 597 caribou.

The Macomb caribou herd was opened to hunting by registration permit during the 1997–1998 season. A harvest quota of 30 bulls was set for the hunt. We issued 143 permits, 94 people hunted, and 22 caribou were reported killed.

Progress Meeting Project Objectives: Data collected and population modeling indicated herd size was only slightly below the population objective. Calf survival and the bull:cow ratio decreased. A registration permit hunt was conducted, but harvest was below the objective. No regulatory changes are recommended. The Unit 20D Wolf Control Implementation Plan, which was intended to improve calf survival and help achieve herd size goals, was not implemented during this reporting period.

Project Location: Unit 20E (10,681 mi^2)
Fortymile Caribou Herd

Project Objectives and Activities:

1. Limit harvest to 150 bulls until year 2001 or the termination of the Fortymile Caribou Management Plan

2. Continue to work with the Fortymile Team, other members of the public, and the Board of Game to implement nonlethal wolf control in winter 1997–98

3. Maintain or increase the number of radio collars to assist in population census efforts

4. Closely monitor harvest using registration permits

5. Monitor radiocollared caribou to determine mortality rate

6. Maintain an October bull:cow ratio of at least 35:100

7. Conduct fall sex and age composition counts

Work Accomplished During the Project Segment Period: We radiocollared 55 1–2-day-old calves, 2 adult cows, and 15 5-month-old female calves as part of a research study to determine limiting factors on the herd. The number of active, independent radiocollars varied between 90 and 120 during the year. In addition to our research study, we followed the radiocollared caribou to determine timing for the census and fall composition surveys and to monitor the fall and winter hunts. We conducted a photocensus on 26 June 1997 and counted 25,910 caribou. The Fortymile herd was relatively stable between 1990 and 1995 (about 22,000 to 23,000 caribou) followed by an increase of 4% between 14 June 1995 and 21 June 1996 and an increase of 10% between 21 June 1996 and 26 June 1997.

The following 3 registration hunts occurred within the range of the Fortymile herd: 1) state Hunt 863 included that portion of Units 20B south and east of the Steese Highway and 20D north of the Tanana River and had a 1-bull bag limit, allowed nonresident hunters, and had a fall harvest quota of 15 bulls; 2) state/federal Hunt 865 included Unit 20E and Unit 25C south and east of the Steese Highway and had a 1-bull bag limit, allowed only Alaska residents and had a fall quota of 85 bulls; and 3) state/federal winter Hunt 867, which included Unit 20E and Unit 25C south and east of the Steese Highway, had a 1-bull bag limit, allowed only state residents and had a quota of at least 50 bulls. The federal hunts followed the same harvest quota but offered 15 extra days of hunting on federal land before the state opening of the winter hunt. In total, 1305 permittees reported taking 143 bull caribou. Including illegal harvest, the total 1997–98 estimated harvest was 150–155 caribou. Hunters continued to support the reduced harvest of Fortymile caribou by foregoing the opportunity to hunt the herd. Number of hunters participating declined by >50%, as compared to 3–7 years ago. Harvest was <0.5% of herd size and had no measurable effect on herd growth.

The estimated annual natural mortality rate for caribou >12 months old was about 6%. Wolves were the primary cause of death. The annual mortality rate for calves was 35%. Causes of death were wolves (63%), grizzly bears (32%), and other predators (5%). Of the 72 newborn calves we collared during May 1998, 24 died (33%) by 19 June 1998 from the following causes: 4.5 by wolves (19%); 7.5 by grizzly bears (31%); 6 by black bears (25%), 4 by eagles (17%), and 1 by a wolverine (4%). Between 1994 and 1996, 38–40% of the calves had died by mid-June and wolf predation had accounted for 33–43% of the deaths. In 1997, the calf mortality rate during that period was 18% and wolves were responsible for 35%. Probable causes for the lower initial mortality rate in 1997 were 1) a shift in the calving grounds to an area not regularly used by wolf packs and 2) cool weather and frequent snow falls that provided mottled snow cover allowing cow caribou to more easily hide their newborns from terrestrial and avian predators. The higher than expected mortality by black bears in 1998 was due to deep snow conditions on the calving grounds in May. Most of the early calving occurred below treeline due to deep snow in the more traditional areas, increasing the vulnerability of calves to black bear predation.

We conducted a posthunt composition count on 30 September 1997, and classified 6196 caribou. The fall 1997 calf:100 cows and bull:100 cows ratios were 41:100 and 46:100, respectively. Calf

recruitment ranged from 32–41:100 over the past 3 years. Bull population trend indicated that harvest was not limiting. Since 1995 the herd increased by 15%. Herd growth can be attributed to increased calf survival and natality rates. Mortality from all sources, predation or accident, declined in 1997 and mortality due to wolves declined in 1996 and, so far, in 1998. Increased natality rates in 1996 and 1998 were due to favorable weather conditions, allowing the herd to remain in prime condition throughout the year. Herd pregnancy rate in May 1997 was about average (85%) for the Fortymile Herd. During 1996 and 1998, herd pregnancy rate for cows 3 years and older was 97%. Due to the higher than normal calf crop in May 1998 and low mortality rates in 1997, the herd is expected to increase by over 10% in 1998.

We collected fecal samples during winters 1992–96 to determine winter range quality. Percent lichen of 72–86% in the fecal samples from all 5 years indicated good to excellent winter range. We collected samples from 5 areas during winter 1997; data are forthcoming.

Many Alaskan and Yukon residents were unhappy with how the Fortymile herd was being managed by the state and federal agencies. In response, several public groups requested ADF&G and the federal agencies to work with the public in developing a Fortymile caribou management plan. In July 1994, a Fortymile Caribou Management Team was established. The team consists of 19 public members and representatives from state and federal agencies. The team's goals were to develop management recommendations to be used by the Alaska Board of Game and the Federal Subsistence Board during their regulatory decision process that would allow the Fortymile herd to recover and once again use its traditional range in Alaska and Yukon. The team met periodically since October 1994 and presented a 5-year management plan, which included recommendations to reduce harvest, implement nonlethal predator control, and work with landowners to protect the Fortymile range. The Alaska Board of Game (BOG), the Federal Subsistence Board, and the Yukon Wildlife Board unanimously endorsed the plan in 1995. The BOG implemented the first segment of the plan by adopting a policy that reduced harvest beginning fall 1996. During spring 1997, the BOG directed ADF&G to begin a nonlethal predator control program including relocating the subordinate wolves and sterilizing the alpha pair in up to 15 packs within the herd's calving and summer ranges.

Progress Meeting Project Objectives: Harvest was reduced to 150 bulls during 1996–1997 following the recommendations in the Fortymile Caribou Management Plan. This harvest level (0.5%) did not limit herd growth. ADF&G, under the guidance of the Fortymile Caribou Management Team, developed an implementation plan to conduct nonlethal predator control during 1997–2001. The components of nonlethal wolf control included sterilizing the parent alpha wolves and relocating all other pack members. The BOG adopted the plan in spring 1997, and wolf fertility control and wolf relocation were implemented in November 1997 and continued in April 1998.

Nonlethal activities were limited to 7 wolf packs responsible for most of the herd's calf mortality for the past 5 years. We began sterilization procedures in November on the alpha male and female from each of 6 packs. A veterinarian performed tubal ligations on the females and vasectomies on the males. We radiocollared the sterilized wolves. On November 13 wolves (7 were radiocollared) older than 1 year were released at least 100 miles southeast of their home territories. In April, 18 11-month to 4-year-old wolves (all were radiocollared) were relocated to the Kenai Peninsula. In

combination with public trapping, this year's program reduced the wolf population by 80% within the eastern and southern portions of the herd's calving grounds. A research program was initiated to monitor effects of the program. The Fortymile Management Team will continue to monitor the program to ensure all actions taken meet the intent of the plan.

No changes to the current management direction or harvest regulations are recommended at this time.

Project Location: Units 21D and 24 (38,160 mi^2)
Galena Mountain, Wolf Mountain, and Ray Mountains caribou herds

Project Objectives and Activities:

Galena Mountain Herd

1. Promote expansion of the herd until it is large enough to allow an increase in the length of the hunting season.

    a. Conduct annual fall composition counts.

    b. Conduct calving surveys.

2. Prevent overharvest of the herd while allowing maximum harvest opportunities of the Western Arctic Caribou Herd, when both occur in the same wintering grounds.

    a. Maintain 20 radiocollars on females in the herd to monitor winter distribution.

    b. Regulate Western Arctic Caribou Herd harvest through emergency order season openings.

Wolf Mountain Herd

1. Determine population size, calving locations, rutting areas, and winter distribution by 1996.

    a. Radiocollar and monitor 20 caribou with a minimum of 6 aerial surveys per year.

    b. Determine major mortality factors by 1998.

Ray Mountains Herd

1. Determine population size, calving locations, rutting areas, and winter distribution by 1996.

    - Radiocollar and monitor 20 caribou with a minimum of 6 aerial surveys per year.

2. Determine major mortality factors by 1997.

- Monitor hunter harvest through harvest reports and hunter interviews in Tanana and Rampart and investigate radiocollared caribou deaths.

Work Accomplished During the Project Segment Period: No composition surveys were conducted on either the Galena Mountain or Wolf Mountain caribou herds in fall 1997. On 15 October 1997, we conducted a composition count of the Ray Mountains Caribou Herd. We counted 1114 caribou and found 763 cows, 98 calves, and 253 bulls, for a bull:cow ratio of 33:100 and a calf:cow ratio of 13:100. We currently have 15 active collars in the herd. Three collars were recovered during this reporting period.

There was no reported harvest from the Galena Mountain and Wolf Mountain herds. Three hunters reported unsuccessfully hunting for caribou in the Melozitna River drainage, which is used by the Wolf Mountain herd. The unreported harvest of the Ray Mountains Herd by residents living along the Yukon River was estimated at 5 caribou per year.

Progress Meeting Project Objectives: Hunting mortality had no effect on population growth of these herds. During winter caribou were accessible to hunters using snowmachines, but the season was closed to prevent overharvest. The occasional expansion of the Western Arctic Caribou Herd into the Galena Mountain Herd winter range has increased the complexity of management of both herds.

We have determined the identity of caribou in the Ray Mountains and Kokrine Hills, based on 3 distinct calving and wintering areas. These are the Ray, Galena, and Wolf Mountain herds. We have enough collars on Ray Mountains caribou to assist with fall composition counts. We should try to keep up to 20 collars on the herd until our objectives are met. More collars need to be placed on Wolf Mountain caribou to aid in meeting project objectives. We do not plan to collar any additional Galena Mountain caribou. Determining major causes of mortality may require more intensive study than just radiocollaring yearling females. Neonatal mortality may be an important factor, but present monitoring efforts are unlikely to offer sufficient data.

Project Location: Unit 25C (5,149 mi^2)
White Mountains Caribou Herd

Project Objectives and Activities: To allow continued growth and natural regulation of the White Mountains caribou herd.

1. To maintain a fall bull:cow ratio of 30 bulls:100 cows.

2. To maintain a reported harvest of <75 caribou, including 30 cows during the winter drawing hunts

3. To maintain at least 20 radiocollared caribou in the herd to adequately measure herd dynamics.

a. Conduct aerial surveys of the White Mountains herd to monitor distribution and population composition annually and estimate population size at least every 3 years.

b. Monitor anticipated increases in recreational use and mining development and ensure such development does not adversely affect the White Mountains herd.

4. Develop a strategy to increase winter hunting opportunities, while minimizing potential for overharvest.

Work Accomplished During the Project Segment Period: Using an R-22 helicopter, we completed aerial composition surveys of the herd in October. At that time, we radiocollared additional caribou to maintain our sample. We monitored hunter effort and timing and distribution of harvests through drawing permit and harvest ticket reports. We developed a proposal to increase winter hunting opportunities and presented it to the Board of Game. They adopted the proposal.

We monitored herd movements and reproduction through aerial radiotelemetry studies. BLM also conducted periodic flights to monitor movements and distribution. ADF&G, in cooperation with the BLM, will continue to monitor the distribution, movements, and reproductive rates of radiocollared animals.

Progress Meeting Project Objectives: We achieved our goal of continued herd growth and natural population regulation. Composition and capture data indicated the herd was healthy and growing. We met our objective for a bull:cow ratio of at least 30:100 and our objective for total harvest. We also met our objectives of maintaining at least 20 functioning radio collars in the herd and of monitoring recreational use and mining development in the herd's range by contact with BLM and other associated agencies. We increased opportunity for winter caribou hunting by converting drawing permit hunts to registration permit hunts.

Project Location: Unit 26B (15,515 mi^2)
Central Arctic Herd

Project Objectives and Activities:

1. Maintain minimum population size of 10,000.
2. Monitor the harvest through field observations, hunter reports, and contact with residents.
3. Coordinate data collection with Research Project 3.35.
4. Conduct censuses and sex and age composition counts.

Work Accomplished During the Project Segment Period: Harvest report cards submitted by hunters provided most of the harvest data, and staff is compiling harvest reports. A preliminary summary indicated hunters harvested 255 caribou, compared with 300-400 per year between 1991 and 1995. FWS contractors and ADF&G Division of Subsistence gathered subsistence harvest data. Harvest stabilized or decreased in recent years but was still well within the sustainable level.

In June 1997 we deployed 16 radio collars on female Central Arctic caribou (8 each on the east and west sides of the Sagavanirktok River). Eight of the 16 caribou were yearlings. We conducted a photocensus in July and estimated 19,700 animals. In early May, we radiotracked the herd to determine wintering areas, locate mortalities, and locate missing collars. In June 1998, 93% of the radiocollared caribou were pregnant.

Progress Meeting Project Objectives: The population size objective was met, with the herd exceeding the minimum population level. During the last week of June 1998, we will deploy 18 collars on female caribou and estimate calves:100 cows from current radiocollared animals. We also met harvest monitoring goals. In view of the favorable status of the herd, existing management objectives were suitable.

Project Location: Unit 26C (10,300 mi^2)
Porcupine Herd

Project Objectives and Activities:

1. Maintain minimum population size of 135,000.
2. Monitor the harvest through field observations, hunter reports, and contact with hunters.
3. Conduct censuses and sex and age composition counts.

Work Accomplished During the Project Segment Period: Harvest report cards submitted by hunters provided most of the harvest data, and staff is compiling harvest reports. Preliminary summary of harvest reports indicated hunters harvested 62 caribou. However, most harvest occurs by local residents who are subsistence hunters. FWS contractors and ADF&G Division of Subsistence gathered subsistence harvest data. Harvest has stabilized or decreased in recent years and was sustainable. Lower harvest was mainly due to caribou distribution.

ADF&G purchased 20 conventional radio collars, which were deployed in Canada by Canadian biologists. ADF&G staff assisted Canadian biologists in deploying 10 satellite collars in October 1997. We were unable to conduct fall composition counts because most of the herd was in Canada. Staff assisted FWS and Canadian biologists in radiotracking caribou in early March to determine wintering grounds. In early June 1998, we radiotracked female caribou to estimate pregnancy rates. Maximum parturition rate of the radiocollared females was 83%. We attempted to estimate calf survival in late June by radiotracking collared females, but most of the herd migrated into Canada before tracking was completed. A photocensus was conducted on 30 July 1998. Staff will count caribou on the photos in October. The last photocensus occurred in July 1994, when we estimated 152,000 caribou. The population was probably stable.

Progress Meeting Project Objectives: The population objectives were met, with the herd exceeding the minimum population level. We also met harvest monitoring goals. In view of the favorable status of the herd, I recommend no change in our management objectives.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	134.5	98.7	233.2
Actual	58.0	88.1	146.1
Difference	76.5	10.6	87.1

Explanation: During the last 7 months of this report period, Region III staff initiated a new time accounting procedure. In December 1997 staff began recording time spent on specific federal aid projects. Previously, staff had recorded only total time which was then prorated to either federal aid or nonfederal aid time according to a fixed percentage that varied among staff positions. Therefore, the "Actual" expenditures for "Personnel" in this report are estimates derived from 7 months of specific project time extrapolated to 12 months. The new procedure unavoidably resulted in what appears to be substantial discrepancies between "Planned" and "Actual" personnel expenditures for most of the FY98 federal aid projects. However, most of these "discrepancies" are not real, and the explanation and justification are presented in the explanation section of each project report. This is a transitional aspect of our accounting and, unlike this year, the FY99 performance reports will reflect 12 months of project time accounting.

Personnel: Although funds appear to be subtantially underspent, they probably were not. The estimated personnel time did not account for the actual time spent midsummer through fall.

Operating: Funds were underspent because cost savings were realized on several projects. Censuses of the Macomb and Delta caribou herds cost less than expected. The Galena office did not spend survey funds because cooperative surveys were conducted in a Fish & Wildlife Service airplane.

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Project Title: **Western Alaska Caribou Management**

Project Location: Unit 18 (42,000 mi^2)
Kilbuck Mountain Herd

Project Objectives:

1. Allow for continued growth of the caribou population in Unit 18.

    a. Estimate herd size and demography of caribou in the Kilbuck Mountains in the southern portion of the unit.

    b. Determine the extent of movement and distribution of the Kilbuck herd and range overlap with the nearby Mulchatna Herd.

    c. Allow a maximum harvest of 5% of the Kilbuck herd by registration permit (bull-only) until the herd reaches a size of 3000 caribou.

    d. Adjust harvest levels after population reaches 3000 or more caribou.

    e. Allow for more liberal seasons and bag limits when the population exceeds 5000 and when substantial numbers of animals from the Mulchatna Caribou Herd immigrate into Unit 18.

2. Reduce the magnitude of illegal harvest of caribou 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 herd was studied in a 6400 mi^2 area in the southern portion of Unit 18. We continued the cooperative study with the Yukon Delta National Wildlife Refuge which was initiated in 1986. Radiotelemetry and survey flights were conducted at periodic intervals to monitor distribution, calving success, recruitment, and population size.

No census or composition surveys were completed in winter 1994–1998 to date because many caribou from the nearby Mulchatna herd had entered the core Kilbuck wintering grounds.

Observations of caribou movements and distribution were made at periodic intervals during the winter, calving, summer, and the fall rutting period. From the distributional data, we documented considerable overlap in ranges of the Mulchatna herd and the Kilbuck herd. Previous radiotelemetry information for the Kilbuck herd from May 1987 to May 1993 indicated most Kilbuck caribou use discrete calving areas and have a high fidelity to their present range. However, range overlap has been substantiated by more recent locations of radiocollared animals. Two-thirds of the females originally collared in the Kilbuck Mountains were located east of Nishlik Lake and intermixed with Mulchatna herd caribou in June 1994. Most of the radiocollared Kilbuck females remained far east of their traditional range during the latter part of 1994, 1995,

and early 1996. In 1997 the department made no flights during the reporting period because of the death of the Unit 18 area biologist in November 1996.

Again, in 1998 many caribou collared as Kilbuck caribou calved with the Mulchatna herd. However, while doing work primarily for brown/grizzly bears, we noticed that some caribou were still calving in the traditional Kilbuck caribou calving grounds.

Sixty-nine hunters reported hunting caribou and 10 were unsuccessful. Fifty-nine successful hunters reported taking 82 bulls and 33 cows for a total reported harvest of 115. From conversations with area residents, we believe this harvest figure is a severe underestimation of the actual harvest.

Progress Meeting Project Objectives: The Kilbuck herd had increased dramatically from an estimate of less than 1000 animals in 1985 to approximately 4500 animals in December 1995. There is no reason to expect that herd growth has not continued. We are presently increasing seasons and bag limits in response to influxes of the Mulchatna herd (Population Objective 1e). We drafted a proposal to lengthen the season for the 1997–1998 regulatory year in cooperation with FWS and the villages in Unit 18 which was approved by the Board of Game. The season is now opened by emergency order with up to a 5 caribou bag limit. This authority was used to open a season from 25 August 1997 through 31 March 1998 with a 5 caribou bag limit.

The incidence of illegal harvest is still a problem in the western portion of the herd's range. However, increased enforcement efforts by the state helps document the amount of illegal harvest.

Increased support by the village governments and other agencies of caribou management in the Kilbuck Mountains has been greatly enhanced through the cooperative management planning process. Several village councils and AVCP have drafted resolutions in support of the cooperative management plan and finalization. The plan has been held statewide as an example of successful cooperative management.

Project Location: Unit 21D, 22, 23, 24, and 26A (160,280 mi^2)
Western Arctic Herd (WAH)

Project Objectives:

1. Maintain a minimum population size of 200,000 caribou.

    a. Conduct a photocensus every 2–3 years to estimate population size.

    b. Conduct periodic radiotracking flights to monitor herd distribution and mortality.

    c. Maintain a year-end sample size of at least 100 operational radiocollars on living caribou.

    d. Conduct aerial surveys during April and May to assess short yearling recruitment.

e. Conduct aerial surveys during early June to monitor initial calf production.

f. Conduct aerial surveys during October to assess herd composition and retrieve radiocollars.

g. Collect approximately 75 blood samples annually to monitor the incidence of selected diseases and pathogens.

h. Monitor hunting and other mortality factors through harvest reporting, collection of biological specimens, and public contacts.

2. Improve public communication.

   a. Reduce unreported harvests.

   b. Involve students in the Onion Portage collaring project as part of our educational program.

   c. Facilitate the exchange of information between managers and hunters.

3. Minimize conflicts between caribou and the reindeer industry.

   a. Conduct radiotracking flights to monitor the distribution of caribou near reindeer ranges.

   b. Notify the Reindeer Herders Association of the location and movements of satellite-collared caribou near reindeer ranges.

4. Monitor the distribution and movements of caribou near the Red Dog Mine, Port Site, and Road to assess impacts and minimize conflicts with industrial development

5. Develop updated population objectives in cooperation with the public and other agencies.

6. Improve the accuracy of harvest data for the WAH.

   a. Begin collecting harvest data using community harvest assessment techniques for selected villages within the range of the WAH with the intent of eventually estimating the total harvest by rural residents.

   b. Issue reminder letters to nonlocal hunters who hunt WAH caribou under the statewide harvest ticket system and fail to voluntarily report the results of their hunt.

7. Continue to assess the feasibility of comanagement of this herd with native groups, sport hunters, commercial operators, federal agencies, Fish and Game advisory committees, regional advisory councils and other interested parties.

Work Accomplished During the Project Segment Period: During September 1997, we instrumented 22 caribou with radio collars near Onion Portage on the Kobuk River (20 conventional collars and 2 satellite collars). We began the 1997–1998 "collar year" (1 Oct–31 Sep) with 148 potentially active conventional radio collars on WAH caribou (131 cows

and 17 bulls). Twelve radiocollars on cows were also equipped with a platform terminal transmitter (satellite transmitter) of which 7 were functional.

During this reporting period, staff conducted numerous telemetry relocation flights from our Nome, Kotzebue, Fairbanks, and Barrow offices. In addition, Gates of the Arctic National Park chartered radiotelemetry relocation flights in the central Brooks Range. Flights were conducted in Units 21D, 22, 23, 24 and 26A. We conducted numerous telemetry relocation flights on the central and eastern portions of the Seward Peninsula during October 1997–May 1998 as caribou reoccupied historic ranges now used by the reindeer industry. We monitored all radiocollared WAH caribou during these flights.

Composition surveys during October (49 collared caribou and 10,072 counted) yielded ratios of 43 calves:100 cows and 49 bulls:100 cows.

We conducted aerial recruitment surveys in Unit 23 during April and May 1998. During these surveys, radiocollared caribou were relocated and composition was determined for no more than 200 animals in the immediate vicinity of each collared individual. For 46 collared cows in 34 groups, we counted 8994 caribou and observed 21 short yearlings:100 adults.

Calving ground surveys were completed during June 1998 in the northern foothills of the Brooks Range, southern portion of the North Slope, Noatak River drainage, and Nulato Hills. Our estimate of calf production (53 calves:100 cows) was based upon observation of 78 radiocollared cows.

Harvest is monitored using the WAH registration permit system for local residents, and the statewide harvest ticket system for nonlocal residents and nonresidents. Compliance with reporting requirements is low for nonlocal hunters, and especially low for local hunters. Therefore, all harvest data represent minimum counts. Subsistence hunters are estimated to take 20,000 caribou within the range of this herd annually, and sport hunters 3000 caribou.

We continued to discuss comanagement of this herd with private organizations, federal land management agencies, guides, local state advisory committees, and federal regional councils.

Progress Meeting Project Objectives: We maintained a year-end sample size >100 radiocollared caribou in the WAH during the reporting period. We do not plan to increase the sample of radio collars in the herd because technological limitations occur when radiotracking more than 125 radio collars at a time. We believe increasing the number of WAH radio collars would lead to inefficient and incomplete relocation surveys which, in turn, would compromise the accuracy of mortality and recruitment estimates that are based on collared caribou.

Aerial radiotelemetry and distribution surveys show that large numbers of caribou use winter ranges south of the Selawik Hills within and adjacent to reindeer ranges. Substantial losses of reindeer through mixing with WAH animals again occurred during this reporting period.

Project Location: Unit 26A (53,000 mi^2)
Teshekpuk Lake Caribou Herd

Project Objectives:

1. Maintain a stable or increasing population for the Teshekpuk Lake Herd (TLH) and provide for hunting on a sustained yield basis.

   a. Determine the herd population size every 2–3 years.

   b. Determine calf production and the percentage of calves surviving their first winter.

   c. Delineate the calving grounds each year.

   d. Identify and map the herd's movements and distribution throughout the year, using survey and radiotelemetry data.

   e. Develop a system to capture caribou without the use of drugs.

   f. Encourage local participation in research and management decisions.

   g. Determine the extent of the harvest using methods that are acceptable to hunters and the participating agencies.

   h. Determine sources of significant, nonhunter mortality.

2. Provide educational opportunities for students and other members of the public.

3. Minimize conflicts with industrial development.

   a. Use satellite and VHF radio collars to monitor the distribution and movements of caribou near areas of potential industrial development to assess impacts.

   b. Define critical caribou habitat areas such as calving, insect relief, and wintering areas in Unit 26A, using aerial survey information and locations from satellite collars.

4. Develop updated management objectives in cooperation with the public and other agencies.

Work Accomplished During the Project Segment Period: Weather conditions interfered with completing a photocensus during the reporting period. Previous censuses in 1989 (16,649 caribou counted), 1993 (27,686 caribou), and 1995 (25,076 caribou) show the TLH increased at a rate of 14% per year during the period 1989–1993, and since then the herd has stabilized or declined slightly. Department staff and the North Slope Borough Department of Wildlife Management (NSB) conducted these censuses.

In a cooperative effort with the NSB and BLM, we captured 14 caribou north of Teshekpuk Lake during 3 and 4 July 1997. We netted the caribou using a Hughes 500 helicopter, equipped with a skid-mounted net gun, and restrained them using a blindfold and hobble ropes. We attached 2

satellite and 12 VHF radio collars to aid in population, productivity, and movement studies. We collected blood samples and measured, weighed, and assessed the body condition of the captured caribou.

We conducted composition surveys on 5 July 1997, using a Hughes 500 helicopter to fly transects north of Teshekpuk Lake. We classified 3771 caribou and saw 428 yearlings, 1907 cows, 469 bulls, and 967 calves. We counted 51 calves:100 cows and 25 bulls:100 cows. The number of calves was much lower than we have observed in previous years and coincided with the poor calf survival we observed in collared cows during June of 1997. The percentage of bulls was also lower but probably indicated that many bulls had not moved north of the lake at that time.

We flew fall composition surveys on 15 October 1997 by flying to radiocollared cows and counting adults and calves in the area surrounding the collared animal. Among 1040 caribou, we counted 145 calves for 14% calves, or 16 calves:100 adults. This was lower than the 21% calves counted during the fall of 1996.

Calving surveys were flown from 11 to 15 June 1998. We located 30 collared cows and 16 of these had calves, a 53% calving success. Four of these cows were yearlings in 1997 and would not be expected to have calves. Therefore, the successful calving rate among mature cows was 62%. Collared caribou were scattered from near Barrow and Atqasuk to Kogru Inlet. However, 11 of 16 cows that had calves were located in the traditional calving area east, northeast, and southeast of the lake.

We monitored the movements of 6 satellite-collared caribou. Three of the caribou (Nrs 9507, 9508, and 9509) were collared in 1995 and the batteries in the PTTs expired during August 1997. We were able to track them, using their VHF transmitters and Nr 9707 and Nr 9708 produced calves near Teshekpuk Lake in June of 1998. Caribou Nr 9708 died near Judy Creek. All 3 collars were retrieved. One caribou (Nr 9601), collared north of Anaktuvuk Pass in 1996, spent the summer along the Colville River, traveled north in September and October to Dease Inlet and was near Teshekpuk Lake in December when its PTT failed. Two caribou (Nrs 9705 and 9714) were collared north of Teshekpuk Lake in July of 1997. Caribou Nr 9714 traveled to the Lisburne Peninsula and died in January. Caribou Nr 9705 summered near Dease Inlet, wintered between Wainwright and Atqasuk, and traveled back to Teshekpuk Lake in June. She did not have a calf.

Progress Meeting Project Objectives: Nearly all of the management objectives are being met. During 1995–1996 we completed a photocensus. During 1997–1998 we completed fall composition counts and calving location surveys. Caribou were captured and radio collars attached without using drugs. We relocated caribou with VHF radio collars several times during the year and obtained detailed movement information from satellite radio collars. We will continue to monitor caribou movements and use this information to protect critical habitat areas from the effects 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, Anaktuvuk Pass, and Ouzinke students used satellite collar locations to plot the movements of caribou through fall and winter.

Mortality among the collared caribou was at least 17%. Some of the collared caribou not found might have died outside the survey area. In previous years mortality has averaged about 21%. Many TLH caribou wintered near Barrow and the harvest rate was probably relatively high during 1997–1998.

We worked with the North Slope Borough to develop a more effective harvest monitoring system based on having harvest monitors in each village. The number of caribou reported harvested in Anaktuvuk Pass, Atqasuk, and Nuiqsut during 1994–1995 were 311, 187, and 249, respectively (Brower and Opie, 1996 and 1997). It is impossible to determine how many of these were from the TLH.

Segment Period Project Costs:

	Personnel	Operating	Total
Planned	135.0	89.0	224.0
Actual	135.0	122.7	257.7
Difference	0.0	-33.7	-33.7

Explanation: Additional expenses for satellite radio collars for the Western Arctic Caribou Herd caused operating costs to exceed planned costs. Anticipating a photocensus in July 1999, we deployed more radio collars because of the large herd size.

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