Alaska Department of Fish and Game
Division of Wildlife Conservation
(907) 465-4190 – PO Box 115526
Juneau, AK 99811-5526

CHAPTER 4: CARIBOU MANAGEMENT REPORT

From: 1 July 2012
To: 30 June 2014

LOCATION

GAME MANAGEMENT UNITS: 9C and 9E (19,560 mi^2)

HERD: Northern Alaska Peninsula

GEOGRAPHIC DESCRIPTION: Alaska Peninsula

BACKGROUND

The Northern Alaska Peninsula (NAP) caribou herd is a relatively small but dynamic herd that ranges from the Naknek River drainage to Port Moller. The herd is important to residents of the Alaska Peninsula as food and for many other nonconsumptive values. Historically, the NAP population has fluctuated widely in size, from 2,000 to 20,000 animals. Peaks of 20,000 occurred around 1899 and in the early 1940s. A crash occurred during the late 1940s when the population dropped to around 2,000 caribou. By 1963 the herd had increased to more than 10,000 animals (Skoog 1968). The first radiotelemetry-aided census in 1981 estimated 16,000; by 1984 the herd again peaked at approximately 20,000 animals. With the NAP population at this high level, the traditional boundary between wintering grounds of NAP and the Mulchatna caribou herd (MCH) began to blur. By 1986 a portion of NAP began annually wintering between the Naknek River and Lake Iliamna—well north of their traditional wintering grounds—some years with several thousand NAP animals moving into the area (Sellers 1990, 1995). Biologists believed that excellent forage conditions north of the Naknek River would sustain NAP within the population objective of 15,000–20,000. However, at about the same time up to 50,000 caribou from MCH also began wintering in this area (Sellers 1999). Given this change in winter distribution of both herds, and the increasing competition for winter forage, by the late 1980s biologists decided that NAP should be maintained at the lower end of the management objective—i.e., 15,000 caribou. Ultimately, a population objective of 12,000–15,000 was adopted.

During the late 1980s and 1990s there were multiple factors providing evidence that habitat on NAP's range was under moderate stress, including an observed depletion of lichens; low pregnancy rate and calf weights; high prevalence of lungworms; departure of NAP caribou from traditional wintering grounds (with the exception of mild winters); and increase in body size of NAP caribou after being transplanted to ungrazed range on the Nushagak Peninsula (Sellers 1999; Sellers et al. 2000). During regulatory year (RY) 1993 (regulatory year begins 1 July and ends 30 June, e.g., RY93 = 1 July 1993 through 30 June 1994), a record harvest of 1,345 caribou—in part because of road and trail access from King Salmon and Naknek—and natural mortality estimated at >30% combined to reduce the population of NAP from 15,000 to 12,500.

The herd underwent a continued gradual decline to about 2,000 by 2008 (Butler 2009). The herd experienced extremely poor recruitment from 2003 through 2008 as a result of poor calf production and survival. Although indications of nutritional limitations were still evident in 2007, predation became increasingly important in the decreasing herd size. Recruitment began improving in 2009, and ratios of calves:100 cows and bulls:100 cows began slowly improving from 2009 to present.

As the population declined, NAP changed distribution patterns in winter and summer. By 2000, few NAP caribou moved north of the Naknek River into MCH winter range, and by 2004 calving became dispersed with more occurring in mountainous terrain rather than the customary calving grounds between Bear and Cinder Rivers on the Bering Sea flats.

The average annual mortality rate for collared cows during 1980–1984 as the population approached peak size was approximately 7%. Mortality rate increased to 18% during 1985–1989 when NAP numbered about 20,000, and to 25% during 1992–1998 as the population began declining. Annual mortality rates of adult females ranged from 7% to 18% during 2001–2003. In 2005 a herd health assessment identified heavy parasite loads, the presence of bovine respiratory disease complex, poor immune response, low levels of micronutrients, and chronic dehydration in animals examined. An experimental study to investigate the effects of parasite removal on body condition and calf production was conducted between 2005 and 2007. Analysis indicated that parasite removal increased pregnancy rates. However, effects of parasite removal on body condition were not biologically significant.

In response to the declining population, biologists evaluated intensive management options for NAP in 1999, 2004–2005, and 2007–2009 and concluded that no viable solutions existed to alter the status of this herd (Butler 2009). A Tier II hunting program was instituted the same year to restrict harvest in 1999, but by 2005 hunting was closed entirely and remains so to present. The major impediments to creating a successful intensive management plan included nutritional limitations, and predator control restrictions imposed on federal lands. In March 2010 the Alaska Board of Game authorized a predator control program under the intensive management law which became active in January 2012. Only 15 wolves were taken under the intensive management program compared to 145 wolves harvested under regular hunting and trapping regulations during RY10–RY12.

During the 1998 study, 35% of radiocollared calves (n = 37) died during their first month of life (Sellers et al. 1998a). Predators, primarily brown bears (*Ursus arctos*), bald eagles (*Haliaeetus leucocephalus*), and wolves (*Canis lupus*) caused most of the mortality of calves <2 weeks old, but disease apparently was an important mortality factor in calves >3 weeks old. During a 2005–2007 study, 60% of the radiocollared calves died during the first 2 weeks of life, primarily due to predation by wolves and brown bears (Butler 2009). Calf mortality remained high between 2 weeks and 4 months of age (66% mortality) though the cause of the late calf mortality is unknown. Evidence that large predators were present at mortality sites was found, but scavenging could not be distinguished from predation due to the large time interval between calf mortality and site investigation (typically ≥1 month).

Age-specific productivity was monitored during 1997–1999 (Valkenburg et al. 1996; Sellers et al. 1998a, 1998b, 1999, and 2000). Overall, this work demonstrated that NAP was under

moderate nutritional stress. No 2-year-old females have produced calves (n = 32), and only 33% of 3-year-olds (n = 18) have been pregnant. Overall pregnancy rates were relatively low at 57% to 78% for cows over 2 years of age during 2005–2008.

Ratios of population composition varied widely as NAP increased and decreased in size (Butler 2009). During 1970–1980 when NAP was growing, the average fall calf ratio was 50 calves:100 cows (range = 45–56). The fall ratio averaged 39 calves:100 cows (range 27–52) between 1981 and 1994 when the population was near management objectives. During the decline the ratio averaged 26 calves:100 cows (range 18–38 between 1995 and 2002). From 1990 to 2004, the bull:cow ratio averaged 41:100 (range 31–49), but the ratio dropped to an average of 23 bulls:100 cows from 2005 to 2009 (range 19–27, Table 1) despite hunting closures. From 2003 to 2009 fall calf ratios were the lowest ever recorded for this herd, with an average of 9 calves:100 cows (range 7–16, Table 1). It is likely that poor calf recruitment since 2003 and the relatively short lifespan of bulls compared to cows have decreased the bull:cow ratio in this herd (Butler 2009).

MANAGEMENT DIRECTION

MANAGEMENT OBJECTIVE

- Maintain a population objective of 12,000–15,000 caribou with an October sex ratio of at least 35 bulls:100 cows.

METHODS

POPULATION STATUS AND TREND

Population Size

We conducted aerial surveys to assess population size (i.e., minimum count) in October when weather allowed during this reporting period. In previous years, biologists sometimes conducted population counts during the postcalving period, assisted by the use of photography when postcalving groups are much larger and more difficult to count. Fixed-winged aircraft pilots located caribou groups with radiotelemetry equipment, and biologists aboard a helicopter counted and determined composition of each group. We assessed survey comprehensiveness using the proportion of radiocollared caribou encountered relative to total radiocollared caribou. A minimum count was rejected if we considered sample size or survey coverage inadequate, usually because of poor weather conditions over a portion of the range. Adjusted minimum counts were calculated by dividing the minimum count by the proportion of radiocollared caribou observed.

Population Composition

We conducted sex and age composition surveys during October between Whale Mountain and Port Moller using the above methods. Caribou were classified as calves, cows, and small, medium, or large bulls.

Parturition Surveys

We flew parturition surveys in late May or early June using the above methods. We classified caribou on the calving grounds as parturient cow (with calf, hard antlers or distended udder),

nonparturient cow, yearling, or bull (Whitten 1995). We also observed radiocollared females to potentially document age-specific pregnancy rates.

Radiotelemetry Data

Caribou were captured and marked with radio collars with the help of funding provided by U.S. Fish and Wildlife Service, Office of Subsistence Management. During each capture, standard measurements and blood samples were taken when feasible. Herd distribution and survival rates are monitored periodically by radiotracking of collared animals. The goal is to maintain 30 VHF radio collars on adult female caribou to aid in locating the herd during surveys and to obtain basic information about the animal's condition.

Mortality

With the exception of a few ceremonial harvests, hunting for caribou has been closed since 2005.

RESULTS AND DISCUSSION

POPULATION STATUS AND TREND

Population Size and Composition

Department staff conducted composition surveys of NAP in October 2012 and 2013 (Table 1). Although caribou have failed to form large aggregations in recent years, radio collars have been useful in locating adequate samples for the composition count. Based on the number of caribou observed during fall composition surveys the population size of NAP was slowly increasing, as have calf:cow and bull:cow ratios (Table 1).

Parturition Surveys

We flew a 2-day parturition survey (30–31 May 2014) on NAP under cloudy to partly cloudy conditions, light winds, and no volcanos erupting. A low ceiling prevented access to caribou range above approximately 1,000 feet elevation. As a result, we detected only 47% (17 of 36) of active cow collars and obtained visuals on 3 collars. The overall pregnancy rate for NAP was 66% based on an evaluation of 100 cows that were 2 years of age and older, out of a total 259 caribou observed. There was no difference in pregnancy rates between the southern and northern portions of the herd. This was substantially lower than the previous 5-year (2008–2012) average of 81%. We think that this rate was biased low because of our inability to see cows at higher elevations where many have calved in recent years; and that we counted nearly equal numbers of bulls (98) and cows (100) on this survey compared to 31 bulls:100 cows last October. In addition, as this population grows we can expect a somewhat reduced pregnancy rate before young cows reach breeding age.

We observed a difference in phenology of calving periods between NAP where most calves were too old to capture on foot at the end of May, and the southernmost Unimak Island herd where calving was just beginning. Plant phenology observed south of Port Moller was substantially later than that of NAP (Pitcher et al. 1990).

Radiotelemetry Data

We captured 9 cows during April 2013 between the Ugashik and King Salmon River drainages. Body condition of the cows handled was judged to be good to excellent.

MORTALITY

Harvest

Season and Bag Limits. State and federal hunts were closed in RY05 due to concerns for the herd's status and have not been reopened.

The intensive management program to control wolf predation has been unsuccessful on NAP. Intensive management harvest has been low (i.e., 15 wolves versus 204 by regular hunters and trappers, including 55 by nonresidents) during the 2010–2013 operational period. Fuel and operating costs incurred by participants is high, and staff time and paperwork are substantial. We believe that the program fails a simple cost-benefit analysis, particularly when considering that nonresident hunters on the ground have killed nearly 4 times the number of wolves as the aerial predator control program.

Alaska Board of Game Actions and Emergency Orders. There were none during the reporting period.

Harvest by Hunters. Four bull caribou were harvested under ceremonial permits during the reporting period (Table 2).

Hunter Residency and Success. The few caribou harvested were by local residents for educational and ceremonial purposes (Table 3).

Harvest Chronology. Caribou were harvested during winter months (Table 4) using snowmachines (Table 5).

CONCLUSIONS AND RECOMMENDATIONS

Population metrics of NAP indicated an upward trend and improving bull and calf ratios during the reporting period. Assuming this trend continues we recommend opening a Tier II drawing hunt for residents only in RY16. We recommend discontinuing the unsuccessful intensive management program to control wolf predation.

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PREPARED BY:

David W. Crowley
Wildlife Biologist III

APPROVED BY:

Todd A. Rinaldi
Regional Management Coordinator

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Table 1. Northern Alaska Peninsula caribou herd fall composition counts and estimated population size, Southwest Alaska, regulatory years[a] 1990–2013.

Regulatory year	Bulls: 100 cows	Calves:100 cows	Calves (%)	Cows (%)	Proportion of bulls (%)			Total bulls (%)	Composition sample size	Estimate of herd size
					Small	Medium	Large			
1990	41	29	17	59				24	1,484	17,000
1991	42	47	25	53	54	34	12	22	1,639	17,000
1992	40	44	24	54	44	38	19	22	2,766	17,500
1993	44	39	21	55	52	29	19	24	3,021	16,000
1994	34	34	20	59	58	28	14	20	1,857	12,500
1995	41	24	15	60	49	29	22	25	2,907	12,000
1996	48	38	19	54	71	19	10	26	2,572	12,000
1997	47	27	16	57	54	31	14	27	1,064	10,000
1998	31	30	19	62	57	28	15	19	1,342	9,200
1999	40	21	13	62	58	30	12	25	2,567	8,600
2000	38	18	12	64	59	24	18	24	1,083	7,200
2001	49	28	16	57	61	24	15	28	2,392	6,300
2002	46	24	14	59	57	19	24	27	1,007	6,600
2003	36	11	8	68	46	30	24	24	2,776	
2004	34	7	5	71	40	34	25	24	1,355	3,400
2005	23	7	6	77	37	41	22	18	1,914	
2006	26	14	10	72	26	43	31	18	1,725	
2007	27	7	5	75	29	38	33	20	1,719	
2008	19	10	8	77	33	25	43	15	1,841	2,000[b]
2009	19	16	12	74	30	35	35	14	2,126	2,300[b]
2010	25	18	13	70	30	31	39	17	1,795	
2011	26	20	13	69	26	37	37	18	2,395	
2012	28	22	15	66	24	37	40	19	2,076	2,400[c]
2013	31	21	14	66	26	41	33	20	2,295	2,700[c]

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 1990 = 1 July 1990–30 June 1991.
[b] Minimum population estimate based on fall composition surveys that were not designed to estimate population size.
[c] Adjusted minimum count from October composition survey adjusted by proportion of radiocollared caribou detected.

Table 2. Northern Alaska Peninsula caribou herd harvest, Southwest Alaska, regulatory years[a] 2003–2013.

Regulatory year	Harvest by hunters								
	Reported						Estimated unreported	Illegal	Estimated total[b]
	M (%)		F (%)		Unk	Total			
2003	118	(95)	6	(5)	0	124	75		200
2004	31	(94)	2	(6)	1	34	30		60
2005[c]						0			0
2006[c]	1	(100)				1	0	15	16
2007[c]	1	(100)				1	0	15	16
2008[c]						0	0	15	15
2009[c]						0	0	15	15
2010[c]	3	(100)				3	0	15	18
2011[c]	3	(100)				3	0	15	18
2012[c]						0	0	15	15
2013[c]	4	(100)				4	0	15	19

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2003 = 1 July 2003–30 June 2004.
[b] Estimated total is rounded off.
[c] No Tier II permits issued.

Table 3. Northern Alaska Peninsula caribou herd annual hunter residency and success, Southwest Alaska, regulatory years[a] 2003–2013.

	Successful					Unsuccessful					
Regulatory year	Local resident[b]	Nonlocal resident	Nonresident	Total[c]	(%)	Local resident[b]	Nonlocal resident	Nonresident	Total[c]	(%)	Total hunters[c]
2003	111	13	0	124	(72)	39	10	0	49	(28)	173
2004	34	0	0	34	(69)	13	2	0	15	(31)	49
2005[d]				0	(0)				0	(0)	0
2006[d]	1			1	(100)				0	(0)	1
2007[d]	1			1	(100)				0	(0)	1
2008[d]				0	(0)				0	(0)	0
2009[d]				0	(0)				0	(0)	0
2010[d]	3			3	(100)				0	(0)	3
2011[d]	3			3	(100)				0	(0)	3
2012[d]	0			0	(0)				0	(0)	0
2013[d]	4			4	(100)				0	(0)	4

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2003 = 1 July 2003–30 June 2004.
[b] Local residents are residents of Units 9A, 9B, 9C, and 9E.
[c] Includes hunters of unspecified residency.
[d] Tier II hunt closed until herd recovers sufficiently.

Table 4. Northern Alaska Peninsula caribou annual harvest chronology percent by month, Southwest Alaska, regulatory years[a] 2004–2013.

Regulatory year	Harvest chronology percent by month									
	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	*N*
2004	21	14	0	7	28	7	0	0	24	29
2005[b]										0
2006						100				1
2007						100				1
2008										0
2009										0
2010								33	67	3
2011				33			67			3
2012										0
2013							50	50		4

[b] Season closed after 2004.

Table 5. Northern Alaska Peninsula caribou harvest percent by transport method, Southwest Alaska, regulatory years[a] 2004–2013.

Regulatory year	Harvest percent by transport method							
	Airplane	Horse	Boat	3- or 4-Wheeler	Snowmachine	ORV[b]	Highway vehicle	Other
2004			18	44	26	6	6	
2005[c]								
2006								100
2007								100
2008								
2009								
2010					100			
2011					100			
2012					100			
2013					100			

[a] Regulatory year begins 1 July and ends 30 June, e.g., regulatory year 2004 = 1 July 2004–30 June 2005.
[b] ORV = off-road vehicle.
[c] Season closed after 2004.