Management Plan for the
Chisana Caribou Herd



Prepared by: Chisana Caribou Herd Working Group
July 2012 > FINAL

2010 – 2015

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This management plan shall not create any commitments or obligations that are legally binding on the planning participants or create or affect any legal rights of the planning participants. Without limiting the generality of the foregoing, this management plan shall not create, affect, define, interpret or apply any roles, responsibilities, rights or interests under a Yukon First Nation Final Agreement.

Modifications to the plan may be necessary to include new objectives or findings.

This plan may be cited as: Chisana Caribou Herd Working Group. 2012. Management plan for the Chisana caribou herd: 2010-2015.

Government of Yukon Department of Environment Whitehorse, YT. 48pp.

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Gretchen Roffler: pp 11, 14, 17, 18, 21, and 24
??? (Government of Yukon): 4, 9, 10, 12, 13, and 30

ISBN 978-1-55362-610-7

Management Plan for the Chisana Caribou Herd 2010 –2015

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Government of Yukon, as represented by the Department of Environment

July 5/11
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Alaska Department of Fish and Game

7-11-12
Date

United States Fish and Wildlife Service, as represented by the Tetlin National Wildlife Refuge

5/22/12
Date

National Park Service, as represented by the Wrangell St. Elias National Park and Preserve

6-26-12
Date

EXECUTIVE SUMMARY

The Chisana caribou herd (CCH) is a small international herd occurring in Yukon and Alaska on the Klutlan Plateau and near the headwaters of the White River. During the 1990s through 2003, the herd experienced a long and steady decline in population. Low recruitment, predation, climate, habitat, and harvest pressure likely all contributed to the decline. From 2003 to 2006, a recovery effort designed to increase recruitment and calf survival was conducted. Pregnant cows were captured and enclosed within a holding pen during the last weeks of gestation and a few weeks following calving.

During recovery planning and upon the completion of the program, the need for a management plan was stressed by the recovery team. As a result, a working group was established to develop a management plan for the CCH in 2009. This working group was comprised of members from Government of Yukon, Alaska Department of Fish and Game, White River First Nation, Kluane First Nation, U. S. National Park Service, and the U. S. Fish and Wildlife Service.

Diverse management mandates and interests for managing Chisana caribou were considered, and as a result the working group jointly produced this management plan with the ultimate goal of supporting a stable or increasing population. The objectives, strategies and tasks described herein are associated with population monitoring, harvest, habitat, predation, research, and public awareness.

ACKNOWLEDGMENTS

This five-year plan intends to coordinate the work of these management authorities to guide the management of the CCH.

Through cooperation and mutual respect among the management authorities, a management plan that reflects the values and interests of each of the parties was created. Appreciation is also extended to the U.S. Geological Survey and the Canadian Wildlife Service for the provision of input and support throughout the duration of the planning process.

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RESPONSIBLE AGENCIES AND JURISDICTIONS

As an international herd ranging across multiple jurisdictions, a number of responsible agencies (management authorities) have either a management interest or authority over Chisana caribou (Figure 1). The legislation, regulations, policies, and management directions in place to manage ungulate species, such as caribou, are complex and differ between Yukon and Alaska.

In Alaska, the Chisana caribou herd (CCH)[1] ranges over state-owned land and within the boundaries of Tetlin National Wildlife Refuge (TNWR) and Wrangell-St. Elias National Park and Preserve (WSEPP). Both the TNWR and WSEPP represent federal agencies—the United States Fish and Wildlife Service (USFWS) and the United States National Park Service (USNPS) respectively. These federal bodies have the mandate to coordinate research, population monitoring, wildlife viewing, public education and awareness, and conservation of wildlife and other resources, including caribou within their boundaries.

Although these federal agencies do not have the authority to implement harvest, they can submit proposals to the Alaska Board of Game (ABOG) or the Federal Subsistence Board (FSB), or alternatively, comment on proposals that have been submitted by others. The ABOG receives, reviews, and makes decisions regarding state-regulated wildlife harvest, whereas the FSB manages the harvest by local subsistence hunters on federal public lands. The USNPS and the USFWS have the authority to close a harvest on caribou, within their boundaries, if they feel a particular herd is at risk under certain conditions. This may include obtaining records that would indicate a harvest is not sustainable, including but not limited to information acquired from monitoring activities, research, or harvest reporting. The *Alaska National Interest Lands Conservation Act* (ANILCA) states that federal agencies must give harvest priority to federally qualified subsistence users if harvest occurs on federal lands. State authorized hunting can be allowed on federal lands when the available harvest quota exceeds the level needed to provide a reasonable opportunity to federal subsistence users. USNPS policy also requires that natural processes be maintained for the benefit of wildlife populations to the greatest extent possible, while still providing for subsistence and recreational harvest as directed by ANILCA.

The Alaska Department of Fish and Game (ADFG), which has a role in managing caribou on state lands, private lands, and most federal lands, may also submit or comment on harvest proposals to the ABOG. The ADFG manages caribou for a variety of uses including wildlife viewing, monitoring and harvest, but the extent to which these management activities occur, varies among herds. Depending on events that could have negative implications for the CCH, the ADFG also has the ability to issue an emergency order to close a state-managed hunt.

1 For a complete list of acronyms included in this plan, and their definitions, refer to appendix A.

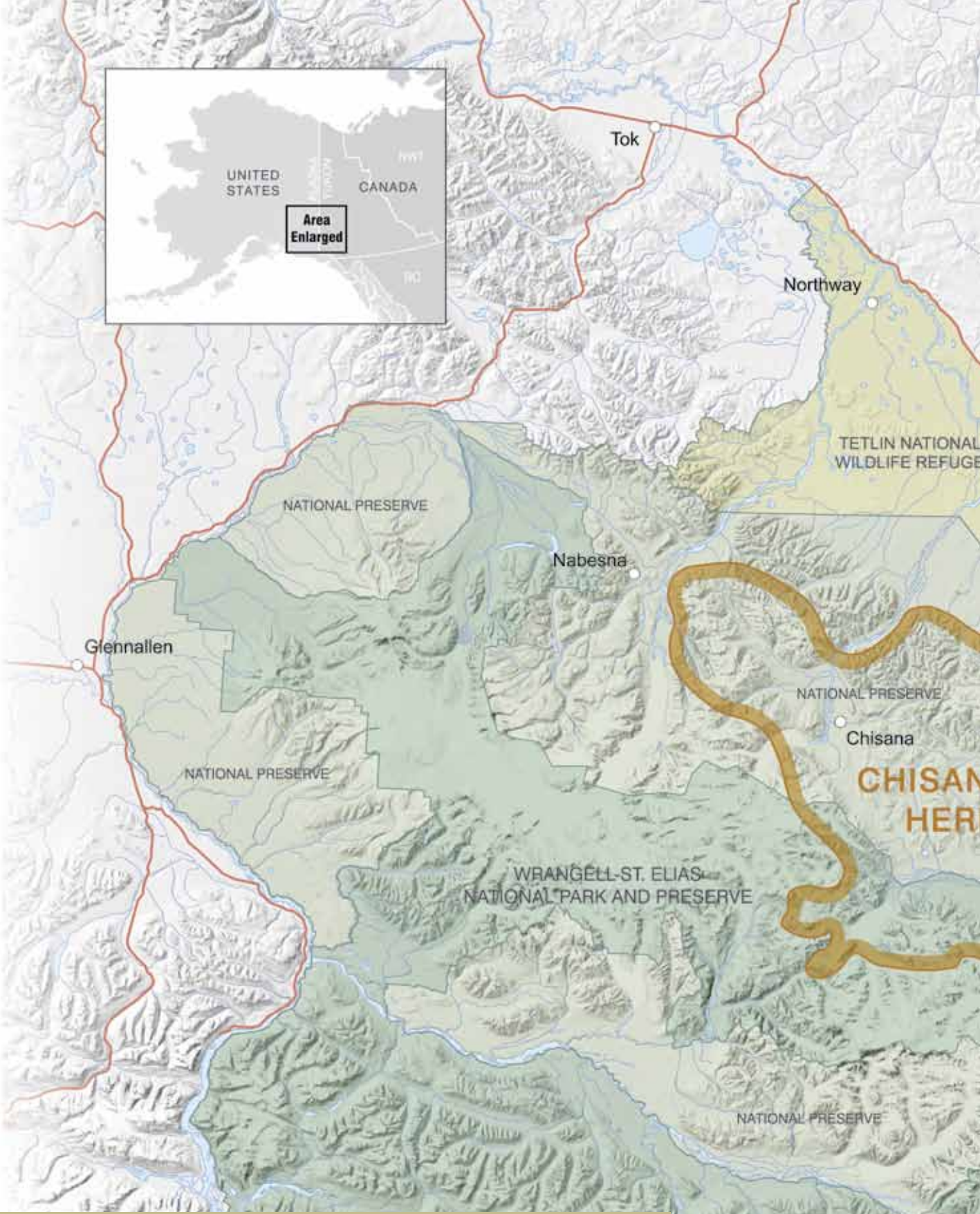
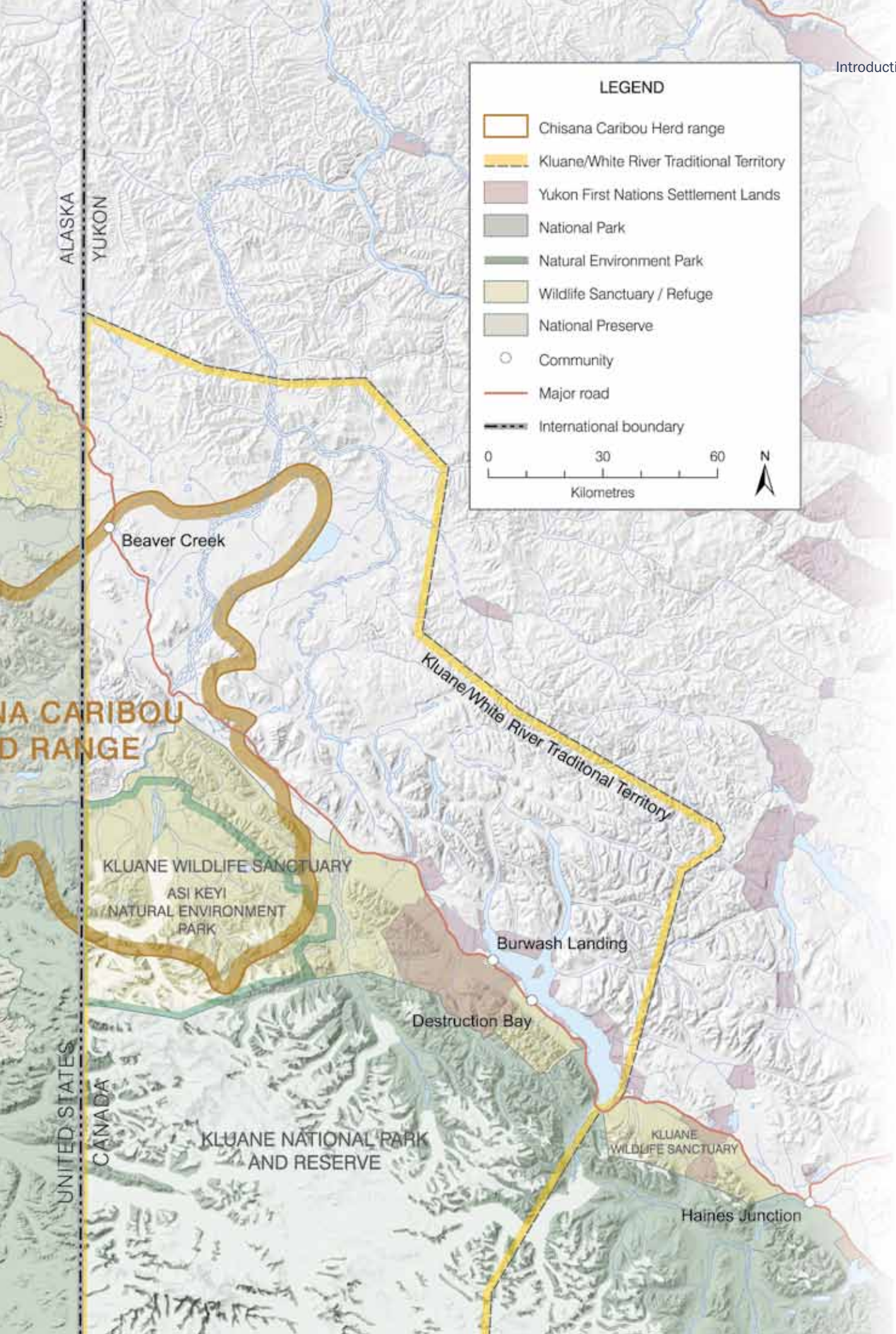


Figure 1. Annual range of the Chisana caribou herd and overlapping political boundaries in Alaska and Yukon. Herd range is based on radio collar locations from 1988–2008 and survey observations by USGS and Environment Yukon from 1978–1983.


LEGEND
Chisana Caribou Herd range
Kluane/White River Traditional Territory
Yukon First Nations Settlement Lands
National Park
Natural Environment Park
Wildlife Sanctuary / Refuge
National Preserve
Community
Major road
International boundary
0
30
60
Kilometres
N
ALASKA
YUKON
Beaver Creek
NA CARIBOU
D RANGE
Kluane/White River Traditonal Territory
KLUANE WILDLIFE SANCTUARY
ASI KEYI
NATURAL ENVIRONMENT
PARK
Burwash Landing
Destruction Bay
UNITED STATES
CANADA
KLUANE NATIONAL PARK
AND RESERVE
KLUANE
WILDLIFE SANCTUARY
Haines Junction

In Yukon, the CCH ranges within the boundaries of Kluane Wildlife Sanctuary (KWS) and Asi Keyi Natural Environment Park (AKNEP) and across First Nation settlement land and within the traditional territories of the White River First Nation (WFRN) and the Kluane First Nation (KFN). KFN is a self-governing First Nation and has the ability to manage resources on their settlement land. WRFN has a traditional territory that overlaps exactly with that of KFN, but does not have a signed final agreement. Both First Nations were actively involved in the recovery effort for Chisana caribou and have an ongoing interest in the management of the CCH. Pursuant to the KFN Final Agreement the Dän Keyi Renewable Resource Council (DKRRC) was recently formed, and they are being engaged in this planning process.

On territorial land, including lands in the KWS and the AKNEP (currently undergoing management planning pursuant to the KFN Final Agreement), the Yukon government (YG) is the sole responsible authority for coordinating research and monitoring, wildlife viewing, harvest management and enforcement, and public education. YG has the ability to initiate and close harvest of wildlife populations. However, under the mandate of the Umbrella Final Agreement (UFA), which is the over-arching agreement for all Yukon First Nation final agreements, YG is required to consult with First Nations and the Yukon Fish and Wildlife Management Board (YFWMB) on management decisions, especially as they relate to harvest.

The Canadian Wildlife Service (CWS) enforces the Canadian federal Species at Risk Act (SARA) and cooperates in the management of international wildlife populations.

> Under SARA, the Northern Mountain Caribou (NMC) population, which includes the CCH, has been designated a species of "Special Concern".

The CWS developed a management plan for the NMC population with other planning partners (Environment Canada 2012). Preparation of a management plan for CCH complements the broader recommendations of the NMC plan, but is tailored to suit the management needs of the CCH.



PURPOSE OF THE PLAN

This management plan is intended to provide a broad framework of recommendations and strategies to guide management and conservation of the CCH.

It is meant to be a working document based on current circumstances that can be adapted as conditions change and more is learned about the factors that influence the health and population numbers of the CCH. As a herd that crosses international boundaries and ranges across multiple jurisdictions, a coordinated approach to management is essential; this management plan will help ensure interests and concerns continue to be addressed and that the herd is managed in an inclusive and collaborative manner.

DEVELOPING THE PLAN

For the purpose of developing this management plan, a working group[2] was established with participants from WSEPP, TNWR, ADFG, YG, WRFN, and KFN.

The purpose of the working group was to assemble and discuss existing information pertaining to Chisana caribou, and to subsequently recommend a management plan to the management authorities.

In January 2009, a preliminary meeting via conference call was held to discuss issues and concerns regarding the Chisana caribou that were seen to be important and requiring attention in the management plan. These issues, along with timelines for completing the plan, were discussed. A meeting to discuss and develop a draft management plan was held February 17-18 in Tok, AK.

A list of management planning issues was addressed by the working group over the two-day workshop in Tok. In early April, additional discussion occurred with research experts from the United States Geological Survey (USGS) who had been involved in much of the population monitoring of the herd during and after the recovery program. A draft of the management plan was completed for review by the working group in late April.

The plan approval and consultation process varied by jurisdiction. WSEPP consulted with the Cheesh'na Tribal Council and the Mentasta Traditional Council, the Eastern Interior Regional Advisory Council (RAC), the South-central RAC and the Wrangell-St. Elias Subsistence Resource Commission (SRC). Alaska Department of Fish & Game (ADFG) presented the working draft plan to the Alaska Board of Game (ABOG) and consulted the public, including the Upper Tanana/ Fortymile Fish and Game Advisory Committee. On the Canadian side, YG worked closely with WRFN and KFN and the Dän Keyi Renewable Resource Council (DKRRC).

This plan represents a comprehensive assessment of all existing information and knowledge pertaining to the CCH. Input and scrutiny from the working group and research experts has been considered.

2 For a list of working group participants, refer to Appendix B.

CHISANA CARIBOU HERD

Current Status

Information about CCH population trends before the 1970s is limited. By the mid to late 1970s, the herd was estimated at 1000 caribou (Kellyhouse 1980). During the 1980s, environmental conditions were favorable, and the herd increased to about 1900 caribou by 1988 (Kellyhouse 1990). The herd declined to an estimated low of 315 caribou by 2002 (Table 1). Weather and predation were assumed the likely primary causes for the perceived decline (Farnell and Gardner 2002). By 1991 declining bull numbers became a concern, and harvest was reduced through voluntary compliance by guides and local hunters. In 1994 almost all hunting of Chisana caribou was stopped. Research during 1991–2003 indicated that predation was the cause of 89% of the documented mortality among radiocollared cows ≥ 4 months old (Gardner 2003).

Following a more intense population survey by the USGS in 2003, the CCH population was estimated at 720 caribou, substantially higher than previous estimates.

Numerous caribou were likely missed during previous surveys because of the small number of radiocollared caribou, patchy aggregations of caribou, and the tendency of the CCH to use timbered habitat in the fall when surveys were conducted.

Between 2003 and 2006 a captive rearing program was conducted by the Yukon Department of Environment in Yukon. This program successfully increased the number of calves recruited into the population during 2003–2006. Based on census information from 2003 through 2010, the population appears to have been stable between 682 (2010) and 766 (2007) animals (Figure 2; Adams and Roffler 2005 and 2007).

Additional census information will allow us to further validate population trends. During the population decline, data indicated that the age structure was skewed toward old animals and that recruitment of wild-born calves was chronically low. Between 1995–2001 the fall calf: cow ratios averaged 6.3 calves: 100 cows (range 4–14 calves: 100 cows) (Table 1). Based on data collected in October 2007 the CCH contained 13 calves: 100 cows and 50 bulls: 100 cows (Adams and Roffler 2007). In October 2008, 2009, and 2010 ADF&G, NPS and YG conducted composition surveys on the CCH. In 2008 there were an estimated 44 bulls: 100 cows - a substantial increase from the all time low in 1999 when there were only 17 bulls per 100 cows. The 2008 estimate of recruitment was 21 calves: 100 cows, a ratio that is consistent with most mountain caribou herds in Canada which average between 20 and 25 calves: 100 cows (Environment Canada 2012). Following winter of 2008–2009 which included prolonged severe cold and ice on top of deep snow (USDA 2009), the fall 2009 ratio declined to 15 calves: 100 cows, while the bull:cow ratio increased to 48: 100. However, in 2010 recruitment was back up to 23 calves: 100 cows and the bull/cow ratio remained relatively stable at 42:100. A 2011 composition survey indicated a recruitment rate of 16 calves: 100 cows, with a bull: cow ratio of 38 bulls: 100 cows.

In Canada, a management plan (Environment Canada 2012) was recently completed for the Northern Mountain Caribou (NMC) population which is designated a species of "*Special Concern*" under the federal *Species at Risk Act* (SARA). This population includes 36 discrete herds, including Chisana. In 2002, the herd was designated as "*Specially Protected*" under the Yukon *Wildlife Act* following a request from the White River and Kluane First Nations. This designation prohibits all licensed harvest of the CCH and requires a regulation change to initiate a harvest. Both White River and Kluane First Nations have voluntarily agreed not to hunt the CCH.

Table 1. Chisana caribou fall composition counts and estimated population size, 1987–2011.

Date (mm/dd/yr)	Bulls: 100 Cows	Calves: 100 Cows	% Calves	% Cows	% Small bulls (% of bulls)	% Medium bulls (% of bulls)	% Large bulls (% of bulls)	% Bulls	Composition Sample Size	Estimated Herd Size
10/9/1987[a]	39	28	17	60	53	26	21	23	760	1800
9/27/1988[a]	36	31	19	60	28	46	26	21	979	1882
10/4–5/90[a]	36	11	7	68	37	44	19	25	855	1680
9/29/91[a]	40	1	1	71	45	42	13	28	855	1488
9/27/92[a]	31	0	0	76	34	43	23	24	1142	1270
10/5/93[a]	24	2	2	79	30	45	24	19	732	869
9/29/94[a]	27	11	8	72	20	44	35	20	543	803
9/30/95[a]	21	4	4	80	30	23	47	17	542	679
9/30/96[a]	16	5	4	83	40	18	42	13	377	575
10/1/97[a]	24	14	10	72	3	68	28	18	520	541
9/28/98[a]	19	4	3	81	49	14	37	15	231	493
10/1/99[a]	17	7	6	81	57	16	27	14	318	470
9/30/00[a]	20	6	5	80	52	25	23	15	412	425
10/1/01[a]	23	4	3	79	42	23	34	18	356	375
9/30/02[a]	25	13	10	72	28	23	49	18	258	315
9/30/03[b]	37	25	15	62	n/a	n/a	n/a	23	603	720
9/30/05[b]	46	23	14	59	n/a	n/a	n/a	27	646	706
10/12/06	48	21	13	59	34	33	33	28	628	n/a
10/13–14/07[b]	50	13	8	61	n/a	n/a	n/a	30	719	766
10/9/08	44	21	13	61	n/a	n/a	36	27	532	n/a
10/6–10/09	48	15	9	61	31	32	37	30	505	n/a
10/11–15/10	42	23	14	61	30	16	54	25	622	682
10/03/11	38	16	14	66	21	27	52	25	542	n/a

[a] Surveys conducted by ADF&G based on a visual search of the herd range. These surveys were based on fewer (≤32) radio collared caribou than the 2003 (≥94) and later estimates and may have missed caribou in some portions the herd range in Canada. Therefore estimates prior to 2003 are not directly comparable to the 2003–2011 estimates.

[b] USGS survey results. Bulls were not classified to size.

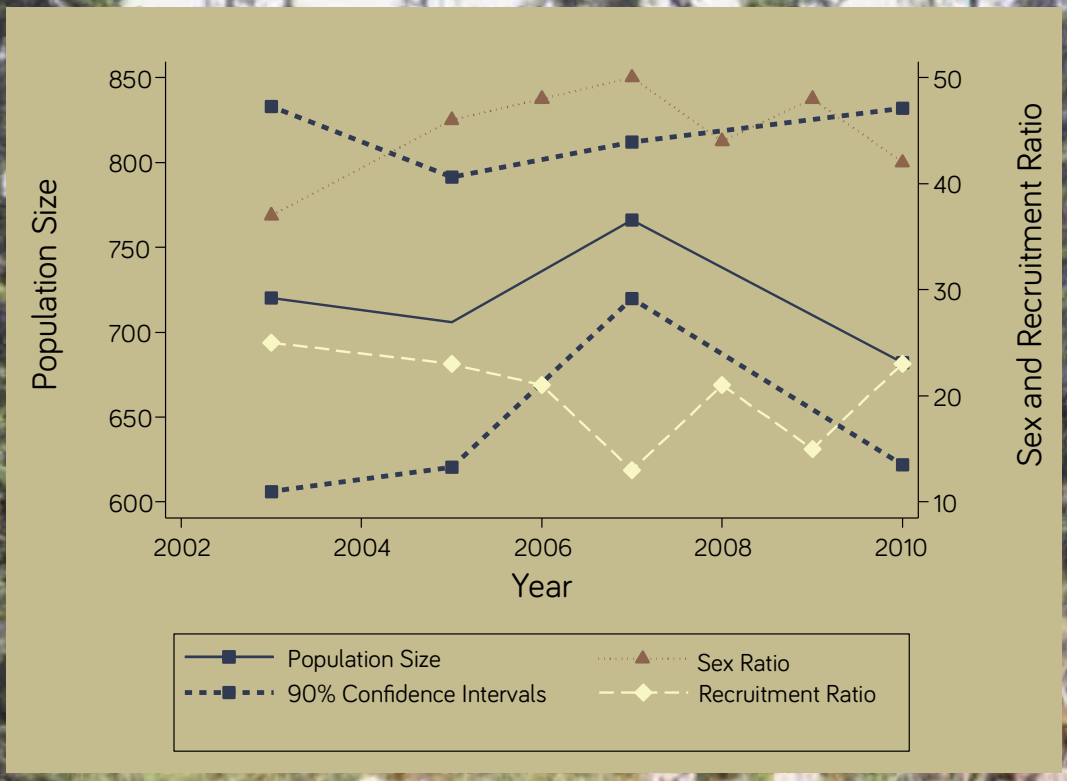


Figure 2. Population trend and composition data (sex and recruitment ratios) for the Chisana caribou herd (2003 – 2010). Ratios are presented as either bulls (sex ratio) or calves (recruitment ratio) per 100 cows.

Taxonomy and Range

In Canada, the Chisana herd is classified taxonomically as *Rangifer tarandus caribou*, and is grouped under the Northern Mountain ecotype of woodland caribou. Behaviourally, the CCH is typical of other mountain herds, particularly with respect to calving where, rather than calving females aggregating in certain areas, they disperse up in elevation and away from other calving females as an anti-predation strategy. In Alaska, the CCH is classified as *Rangifer tarandus grantii*. From a management standpoint, this difference in classification between Canada and the U.S. does not influence the management recommendations set out in this plan for the CCH.



Due to the topography of the region, the CCH is generally aligned along a northwest-southeast direction in east-central Alaska, U.S.A. and southwest Yukon, Canada (Figure 1). The summer range is predominately within WSEPP in Alaska, but the winter range has a larger proportion of the herd occurring in AKNEP. Occasionally the herd has mixed with the Nelchina caribou herd to the northwest in Alaska and north to Beaver Creek, Yukon. The herd range is within the St. Elias Mountains ecoregion, which is distinguished by rugged and glaciated mountains with high peaks (Ecological Stratification Working Group 1995). The Donjek, Generc, White, Chisana, and Nabesna rivers drain the range, and treeline generally occurs at 1,050–1,200 m. White spruce and black spruce are the most commonly occurring trees on well-drained soils and in poorly drained areas respectively. In lowland portions of the range, paper birch, aspen, and balsam poplar are more prominent. The understory includes willow, dwarf birch, soapberry, and ericaceous shrubs. Sedge–tussock fields are common in poorly drained sites and gentle slopes, while the steeper slopes support mosses, alpine forbs, ericaceous shrubs, grasses, and lichens. This range is somewhat unique because of the deep ground layer of volcanic ash from the Mount Churchill eruption 1,200 years ago.

Occasionally the herd has mixed with the Nelchina and Mentasta caribou herds in winter to the northwest in Alaska and north to Beaver Creek, Yukon. Beginning in the late 1980s, the growing Nelchina herd began expanding eastward in winter through the Mentasta herd range to the Tanana Uplands along the Canadian border. A portion of the Mentasta herd accompanied the Nelchina herd to this expanded winter range. Mixing of the three herds can occur when, for example as in the winter of 1989/90, a major portion of the CCH shifted northeast into the upper and middle portions of Beaver Creek where Nelchina and Mentasta caribou overlapped some of the Chisana area of use (Lieb et al. 1994). Within Yukon, the Chisana herd is most similar, genetically, to the Kluane (Burwash) herd to the east (Zittlau 2004, Kuhn et al. 2010). These herds are adjacent to one another and do exhibit a *very* slight range overlap, with the Donjek River representing a boundary between them. From nearly 7700 VHF telemetry relocations of the Chisana herd, only three were located east of the Donjek River, and these represented one cow-calf pair in winter of 2005. From 540 VHF telemetry relocations of the Burwash herd, only four were located west of the Donjek.

Health

The limiting role of disease and parasites on the CCH is poorly understood. Based on fecal samples taken in March 2000 and 2001, there was a low diversity, prevalence, and intensity of gastrointestinal parasites in the CCH, as well as an absence of evidence for bovine respiratory viruses such as Brucellosis (Farnell and Gardner 2002). Samples collected from April to June in 2003, 2005, and 2006 during the captive rearing program indicate a minimum of six parasite genera are present in the CCH (Hoar et al. 2009). *Trichostrongylidae spp.*, common gastrointestinal nematodes, were the most common both in terms of prevalence and intensity but well below the intensity associated with clinical disease. *Protostrongylidae spp.*, parasitic nematodes that infect the central nervous system and muscles, were recovered from approximately 30% of the cows sampled and were at low intensity levels. There is a lack of data on parasite presence from mid to late summer periods when there is a higher probability of detecting eggs and evaluating parasite intensity.



From 1987 – 2005, 283 animals from the Chisana herd were tested for a suite of eight diseases described by Farnell et al. (1999). Only two diseases were detected in any animals from the herd, both at low levels. Infectious bovine rhinotracheitis was detected in 2.8% of the sampled animals, and Leptospirosis was detected in 4.2% of sampled animals.

Overall, recent information suggests that the health of CCH is favorable with respect to viruses and parasites. There is no evidence to suggest that disease has contributed to, or caused, the observed population trends over time (Farnell and Gardner 2002, Hoar et al. 2009).

The body condition of adult Chisana caribou scored average to above-average, when compared to other Yukon woodland caribou herds, and does not suggest that CCH physical condition was unfavorable for the years they were examined (Farnell and Gardner 2002). The average fall calf weight for the CCH between 1998 and 2000 was 64.1 kg – the highest recorded for Alaskan caribou with varying nutritional status (Valkenburg et al. 2000, C. Gardner, unpublished data). Relative to other Alaskan caribou herds, these data indicate favorable physical condition and good health among calves surviving the neonatal period.

Limiting Factors

Habitat and Climate



The winter diet of the CCH is high in moss and low in lichen compared to other Yukon herds from 1981-2001 (Farnell and Gardner 2002). The region has a very high habitat composition of moss and has been anecdotally described as very poor caribou habitat (B. Collins, pers. comm.). The high proportion of moss raises questions about the adequacy of winter forage quality and winter range condition for the CCH because mosses have extremely low nutritional value and digestibility compared to lichens.

Severe weather can have implications for adult and calf physical condition. Poor winter nutrition could lead to lower calf birth weights, reduced development rates, and decreased survival (Espmark 1980, Adams et al. 1995). Evidence from Alaska shows that the poor winters in the early 1990s affected the nutritional status of affected caribou herds (Valkenburg et al. 1996), and therefore may have limited the growth of these herds during those times. Winters with excess snow also make it harder for the caribou to access quality forage and increases the energetic demands of movement. Years in which snow levels remain high during the calving season may also prevent females from moving up in elevation, thus increasing predation on neonate calves. Warmer drier summers may also adversely affect the CCH by increasing insect harassment and decreasing nitrogen content in caribou forage. Heavy surface deposits of volcanic ash throughout much of the herd range may lead to increased early tooth wear and this may have effects on longevity and health.

Predation

Predation by wolves is a primary force limiting caribou in Alaska (Gasaway et al. 1983, 1992; Ballard et al. 1987; Boertje et al. 1996) and Yukon (Gauthier and Theberge 1985, Farnell and McDonald 1988, Hayes et al. 2003). Wolves however, have not been limited by decreases in Chisana caribou due to the availability of moose and Dall's sheep. The low numbers of wolves taken by trappers and hunters in the CCH range are generally not sufficient enough to limit wolf density. At 5.6 animals per 1000 km^2, the most recent wolf density estimates is below the average for Alaska and Yukon study sites (9 wolves per 1,000 km^2; Gasaway et al. 1992).

Grizzly bears are known to prey on caribou, but their impact on Chisana caribou is unknown. Grizzly bear densities are approximately 16-18 animals per 1000 km^2 in the CCH range (Gardner, unpublished data).

Lynx and coyote are periodically abundant following snowshoe hare population trends. Wolverines and golden eagles are also present at unknown densities in the CCH range (Farnell and Gardner 2002).

Human Factors

The CCH range is remote and there are few issues related to access. There are no roads into the range and all-terrain vehicles generally are not used in the area. Access to the area is easiest by snowmobile or aircraft, but occurs infrequently.

Few people in Alaska or Yukon depend on Chisana caribou as their primary source of food. Most harvesting has occurred from big game outfitters in Alaska and Yukon, and subsistence hunting by local First Nations. Harvest from 1975 to 1994 ranged between 13-65 animals in Alaska, and 0-18 animals in Yukon (Yukon government and Alaska Department of Fish and Game, unpublished data). A ban on licensed hunting, as well as a voluntary ban on First Nation harvest, has been in place since 1994 in Yukon and Alaska. Following a request by White River and Kluane First Nations, all forms of licensed harvest have been legally prohibited in Yukon under the *Wildlife Act* since 2002, and now require a regulation change to initiate a hunt on the CCH.



Recovery Program

Following a sharp decline of the CCH in the 1990s to early 2000s, a recovery effort was initiated in joint cooperation between partners from Yukon and Alaska. From 2003-2006, pregnant cows were captured in late-winter and transferred to a holding pen within their natural range. The pen was protected from predators, allowing these animals to safely endure calving and neonatal periods, before being released back into the range. Over the four-year recovery period, 136 calves were released from the pen. Radio-telemetry was used to monitor the survival of both caribou calves raised in the pen and those born in the wild. By excluding predators, calf survival was greatly enhanced through the use of the holding pen, and may have helped to offset further decline in the herd.

Radio-telemetry was used to monitor the survival of both caribou calves raised in the pen and those born in the wild.

Current Research

Telemetry has been used to monitor the herd's seasonal movements and facilitate annual composition counts, population estimates, and estimates of birth rates and adult mortality. Since 1987 both adult female and calf caribou have been radio-collared to maintain a sample of approximately 10–25 animals. Because of the intensive recovery efforts, all captured cows and calves, held within the pen, were also collared. In 2008, there were approximately 131 active radio telemetry collars remaining on animals within the CCH, and as of 2011, there were 90 active collars.

Since 1987 both adult female and calf caribou have been radio-collared to maintain a sample of approximately 10–25 animals.

From 1987 to 2001, annual herd composition surveys were conducted in the fall and herd censuses were conducted during the summers of 1989-1995 and 1997, when the herd formed post-calving aggregations. Censuses were conducted during the fall rut in 2005 and 2007. And in October of 2008 and 2009, herd composition counts were conducted. During development of this plan, a census occurred in 2010 and a fall composition survey was conducted in 2011.







MANAGEMENT GOALS AND PRINCIPLES

Plan Principles

The following sets out principles to guide the management of the CCH and implementation of this management plan:

1. Plan implementation must recognize and respect the government relationships that exist between traditional and historic users, and First Nation, federal, territorial, and state governments.
2. Management of the Chisana caribou herd must respect the mandates of each management authority.
3. Management of the herd and its habitat will depend on the ability of management authorities to develop and implement cost-effective and timely programs and approaches.
4. Management must use the best available information and respect traditional, local, and scientific knowledge.
5. Management of the herd relies on the health of all ecosystem components that support the herd.
6. Consistent with the precautionary principle, required management strategies should not be delayed even if detailed information is limited or lacking. Caution must be exercised to avoid potential effects of human activities to the caribou herd and its habitat.
7. Where possible, this plan will support and be consistent with the Canadian federal Species at Risk Management Plan for the Northern Mountain Caribou population.
8. Implementation of this management plan requires commitment, coordination, and collaboration among management authorities and First Nations.

Management Goal

Through discussions the working group participants arrived at the following goal for the management of Chisana caribou:

> The management authorities will implement management strategies that support a stable or increasing population, and recognize the limiting factors that affect the herd. This will be measured through continued monitoring of sex ratios, calf recruitment and population size.

MANAGEMENT OBJECTIVES AND STRATEGIES

Population Monitoring

Objective 1: Regularly monitor the CCH, track population trends, sex ratios and recruitment, and maintain a herd that is stable to increasing.

Considering recent recovery efforts, the international significance, and the importance of the herd to First Nations and residents of Yukon and Alaska, a cautious approach is being taken to manage the CCH which requires consistent and ongoing monitoring. It is therefore, important to support a stable or increasing population.

Strategy 1.1: Conduct regular monitoring of the herd

To best adhere to the population management goals and indicators, regular monitoring will be required. At least one census is recommended to occur within the life of this plan, and as early as possible to best complement the censuses conducted in 2005 and 2007. Annual fall composition surveys should be conducted in years when censuses do not occur, and annual to semi-annual telemetry flights should be conducted in coordination with other monitoring where possible, as described above.

Recommended Task	Who
Conduct a minimum of one herd census within the life of this plan. Aim to conduct first census in 2010.*	ADFG, WSEPP, YG, TNWR
Conduct annual composition surveys except in years when a census is conducted.	ADFG, WSEPP, YG, TNWR
Conduct 1-2 telemetry flights per year	ADFG, WSEPP, YG, TNWR
Coordinate the recovery of collars from dead caribou during annual composition counts or telemetry surveys	ADFG, WSEPP, YG, TNWR
Coordinate the distribution of results summaries to working group members, USGS, and Environment Canada	ADFG, WSEPP, YG, TNWR

* A census was conducted in 2010.
Another census is recommended within the life of the plan.

Strategy 1.2: Coordinate with research scientists in Alaska to determine a protocol for monitoring Chisana caribou

The USGS is preparing a protocol for monitoring Chisana, Mentasta, and Denali caribou herds for the U.S. National Park Service. The protocol would include information on appropriate sample size for collars and a frequency schedule for composition counts and censuses. It will be the responsibility of the respective parks, WSEPP in the case of Chisana, to implement the protocol and coordinate resources. As of 2011, there were over 100 active radio-collars remaining on the herd and the best approach for maintaining a sample of active collars will be recommended in the protocol.

Recommended Task	Who
Coordinate with USGS during the development of a monitoring protocol for the CCH.	WSEPP, ADFG, YG, TNWR
Determine and identify available budget and staff resources	WSEPP, ADFG, YG, TNWR
Implement and maintain a collaring and monitoring program for a minimum sample of animals as per the monitoring protocol.	WSEPP, ADFG, YG, TNWR



Harvest

Objective 2: Cooperatively manage harvest of the CCH with Yukon and Alaska management authorities to maintain a stable or increasing population.

Because of the herd's decline, all licensed hunting of the CCH has been restricted in Alaska and Yukon since 1994. At this time, Kluane and White River First Nations also issued a voluntary ban resulting in no subsistence harvesting of the CCH. In 2002, the herd was listed as a "*Specially Protected*" population under Yukon's *Wildlife Act*. All licensed hunting in Yukon continues to be legally prohibited under this designation; therefore initiating a harvest requires a regulation change under this legislation.

In spring 2008, the ABOG reviewed a proposal to reinstate harvest of the CCH. Considering the international significance of the herd, the ABOG did not approve the proposal and stressed the need to coordinate with management authorities in both countries before granting such requests. Following this decision, discussions around the feasibility of reinstating a harvest on the CCH have occurred between YG and ADFG.



Harvest of the CCH would be recommended following the determination that the herd is either stable or increasing, based on the 2010 census. On average, mountain caribou herds in Canada average between 20-25 calves per 100 cows. Because recruitment can vary greatly among years, a rolling three-year average of less than 15 calves per 100 cows will trigger the cessation of harvest and a meeting of the management authorities. The three-year average is recommended by the working group as an indicator because it will notify management authorities that the herd may be declining, and it allows time to implement a management strategy to limit further decline. Estimates of less than 35 bulls per 100 cows reported in any given year would also trigger a stop of the harvest and a meeting of the management authorities. These population indicators for a management strategy are outlined in Figure 3.

The population management objective for the Chisana herd focuses on population indicators rather than a target herd size per se. Specific indicators used to determine if harvest is sustainable include sex ratio and recruitment (calf:cow ratio). The completion of the 2010 census allowed managers to assess whether or not the herd growth rate stabilized following recovery efforts, a requirement to even consider the possibility of a harvest, and provided a baseline herd size. Tracking sex ratios allows for an assessment of any effect the proposed bull-only harvest may have on herd composition.

Recruitment rates can be used to assess changes in herd size relative to this 2010 baseline. Requiring formal herd size estimates, obtained through census surveys, may be problematic in the future as the herd is remote and difficult and expensive to survey, and maintaining a sufficient sample size of radio-collared animals in the herd to allow for reliable census estimates to be obtained cannot be assured. Given these factors, relying solely on census information to guide management decisions in the future has the potential to result in inaction due to a lack of information. In the Yukon, censuses of small mountain herds are not conducted as frequently as has occurred with the Chisana herd. Experience in the Yukon with managing harvest on these small mountain caribou herds has demonstrated that basing management decisions on monitoring data such as sex and recruitment ratios can be done effectively.

Strategy 2.1: Based on results of a 2010 census, coordinate efforts among management agencies to recommend a harvest for the CCH

Three censuses are required to estimate a population trend in a herd. Because of the intensive recovery program, and cessation of hunting since 1994, a cautious approach is being taken with respect to reestablishing a hunt on the CCH. The working group waited for the completion of the 2010 census to determine whether the herd was stable or increasing, and had a minimum sex ratio of 35 bulls to 100 cows. These indicators were met and so a harvest of the CCH was recommended to the management authorities.

A recommended strategy for harvest allocation is presented in Appendix C.

If at any time after an approved hunt has been established the population indicators fall below the set thresholds, harvest will cease and the management authorities will meet to discuss management options.

Recommended Task	Who
Based on 2010 census, working group will meet to determine if population trend and sex ratio meet the requirement to re-open the herd to hunting (Figure 3).*	All
Should the population meet the required indicators, recommend to the responsible management authorities that the herd be permissible for harvest by 2011.*	YG, ADFG, WSEPP, TNWR
Consider appropriate means for harvest allocation (see Appendix C for a proposed harvest allocation strategy).	YG, ADFG, WSEPP, KFN, WRFN
If required, remove designation of the CCH as "Specially Protected" under Yukon's *Wildlife Act*.*	YG

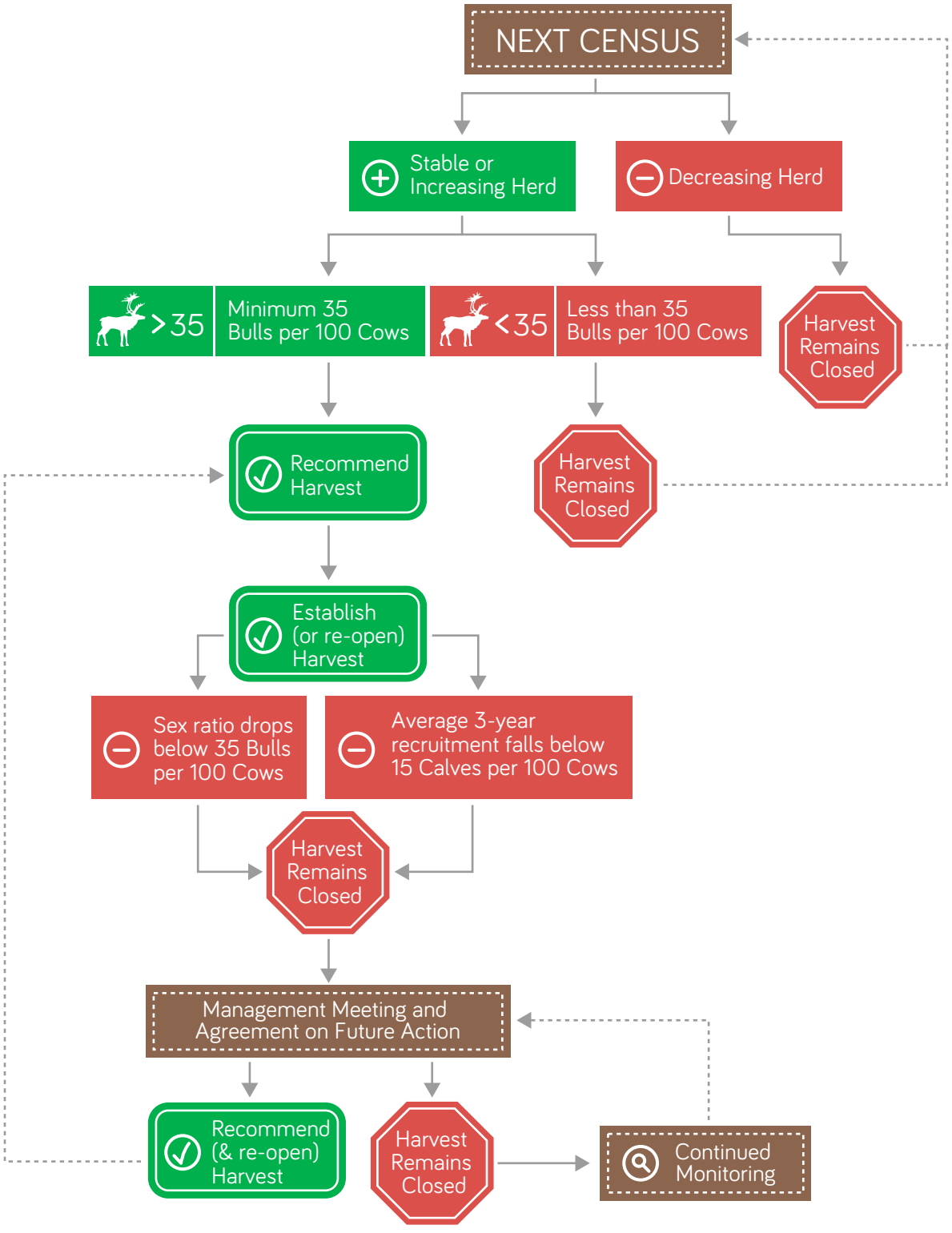


Figure 3. Chisana caribou herd indicators for a harvest management strategy.

Strategy 2.2: Based on continued monitoring of the CCH, as per the monitoring schedule above, close all harvest of the CCH when herd population trends and sex ratios fall below threshold indicators for maintaining a stable or increasing herd

If for any reason, an observed three-year average of less than 15 calves per 100 cows, or an annual sex ratio of less than 35 bulls per 100 cows occurs, any harvest would cease. Recommending re-opening the harvest after this event would depend on agreement among the management authorities regarding future management strategies for the CCH (Figure 3).

Recommended Task	Who
As per monitoring schedule in Strategy 1.1, continue to monitor herd through annual composition counts and set herd censuses.	YG, WSEPP, ADFG
Determine from annual composition counts or censuses if the population falls below threshold indicators for a safe and sustainable harvest.	YG, WSEPP, ADFG
Close the harvest of CCH in Yukon and Alaska if the population has fallen below indicators.	YG, WSEPP, ADFG



Habitat

Objective 3: To better understand the relationship between vegetation on the landscape and the implications to Chisana caribou and other wildlife species.

Very little information exists with respect to habitat quality or habitat use and availability. The high ratio of moss to lichens within the core winter range suggests that this may be low quality caribou habitat. Changes in the tree line and increased shrub growth have been observed throughout the Chisana range; however the effects to Chisana caribou are unknown.

Strategy 3.1: Coordinate the collection of habitat information with other ongoing research and monitoring work in the CCH range

Throughout the life of this plan, telemetry flights, herd composition surveys and population censuses should occur within the CCH range. This provides the opportunity to take advantage of circumstances that will allow the collection of more information on CCH diet, habitat, or vegetation.

Recommended Task	Who
When feasible, collect fecal pellets where possible during surveys or when recovering collars	YG, WSEPP
When feasible, collect baseline vegetation data where possible during surveys or when recovering collars*	YG, WSEPP

* In 2011 a preliminary assessment of the condition of the herd's winter range, in Yukon, was conducted by Environment Yukon. This was to determine if there was sufficient lichen coverage to enable to map lichen abundance using satellite imagery. The low abundance of lichen in the surveyed areas indicated a remote sensing based approach to mapping lichen abundance on the herd's winter range was unlikely to be a useful option.

Strategy 3.2: Encourage and take advantage of research opportunities to increase our current knowledge of habitat within the CCH range

Anecdotal information suggests that poor quality habitat and nutrient-limited food occur within the CCH winter range (B. Collins, pers. comm.). Despite this, there is a general lack of scientific habitat research that has occurred within the range. A number of research opportunities exist if funding or interested researchers become available. These opportunities include but are not limited to:

1. Changing shrub and tree lines and implications to predator-prey dynamics

   There have been observations that the brush-line is moving up in elevation on the Klutlan Plateau. Current research supports these observations in that warmer temperatures resulting from climatic changes will support the advancement of the shrub-line to higher elevations in much of the southwest Yukon (Danby and Hik, 2007). An increase in biomass of woody shrubs species could decrease the availability of alpine tundra habitat that caribou depend on (Sturm et al., 2005). This may also provide additional habitat for moose at higher elevations and draw more wolves into core caribou habitat. Current research is looking at patterns of shrub-line changes in the southwest Yukon (Myers-Smith, 2007), but the impacts to the CCH are largely unknown.

2. Habitat use and availability

   Moss is poor quality forage for caribou, and it has been observed at high composition throughout the CCH range compared to other Yukon and Alaskan herd ranges. This raises questions as to how the caribou are obtaining their required nutrients. Farnell and Gardner (2002) indicate that body conditions of caribou are similar to other herds, suggesting that they are getting the appropriate nutrients. There is interest in better understanding habitat use and availability within the CCH range.

3. Habitat and diet implications to tooth wear, health, and age structure of the herd.

   During the recovery effort, a number of animals were reported with extensive tooth wear, suggesting the age-structure of the herd was skewed to older animals. It is possible that volcanic ash within the region may be quickening the rate of tooth wear in animals. If animals are dying younger because of hastened tooth wear, the reproductive period for cow caribou is shortened. The implications to the overall health of the herd are not well understood.

Recommended Task	Who
Where possible, engage with academic institutions that may have interested graduate students and address research questions.	All
Identify available sources of funding that could be used to fund habitat-related research in the CCH range, as needed.	All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Predation

Objective 4: Obtain more current information on predators in the CCH range to advance our understanding of predators as limiting factors on the CCH.

To understand the limiting effect of predation on Chisana caribou, current information is needed on wolf and bear numbers in the region. This will help managers evaluate effects to the herd so that appropriate management decisions can be made.

Bears were considered in the development of this plan, but due to constraints on time and resources no recommended management strategies for bears are presented in this plan.

Strategy 4.1: Conduct one wolf census within the life of this plan

The density of approximately 6 wolves per 1000 km^2 is below average for interior Alaska and southwest Yukon (Gasaway et al. 1992; A. Baer, Yukon Government, unpublished data). However; the estimate for the core CCH range may be even lower, because a number of larger packs, located on the periphery of the CCH range, were included in this estimate. Although wolves are a limiting factor on caribou, it is not known how the densities of wolves in the area actually affect the CCH. Ideally, surveying wolves once every 5-6 years would be sufficient to evaluate trends in their populations and assess their influence on the CCH. The working group recommends that a wolf survey occur early within the life of this plan.

Recommended Task	Who
Conduct survey of wolves in Yukon and Alaska portions of CCH range	YG, ADFG, WSEPP
Complete survey report and plain language document	YG, ADFG, WSEPP
Compare wolf census data with trends in CCH statistics.	YG, ADFG, WSEPP

Research

Objective 5: Continue to learn more about the CCH and its range so that management agencies are able to make well informed decisions.

A number of observations have been made in recent years that highlight opportunities for further research in the region. This research could advance the ability of managers to make better decisions for the benefit of the CCH. There are potential sources of funding available within and outside each of the management authorities.

Strategy 5.1: Conduct collaborative local and traditional knowledge studies to document CCH historical and current range use

Some work to document CCH habitat use occurred in Northway, Alaska in 1998 and Beaver Creek, Yukon in 2001 that included local elders, community members and management agencies. Further work could be done to engage knowledgeable community members in management of this herd.

Strategy 5.2: Promote and take advantage of research opportunities within the CCH range

A number of research opportunities exist if funding or interested researchers become available. These research topics, in addition to those already mentioned above in habitat include but are not limited to:

1. Climate conditions and weather station analysis.

   Climate is a long term monitoring vital sign for WESPP. Through the USNPS Inventory and Monitoring Program, 5 newly established Remote Automated Weather Stations (RAWS) have been strategically placed at high elevations and in remote areas within WSEPP, some of which supplement existing low elevation stations located near population centers. One of these RAWS is located within the core range of the CCH. These stations record hourly air temperature, relative humidity, wind speed and direction, solar radiation, snow depth, soil temperatures, and summer rain. There is an opportunity to use this data and the analysis provided by USNPS sponsored climate scientists for comparison to population trends of the CCH.

2. Genetics and what determines a barren ground caribou from a woodland caribou.

   Alaska and Yukon classify Chisana caribou differently as barren-ground and woodland caribou respectively. There is interest in determining what genetic factors separate woodland caribou from barren-ground caribou and where Chisana caribou fall taxonomically.

3. Changing predatory-prey dynamics and implications to Chisana caribou.

   Predation by wolves is a primary force limiting caribou in Alaska (Gasaway et al. 1983, 1992; Ballard et al. 1987; Boertje et al. 1996) and Yukon (Gauthier and Theberge 1985, Farnell and McDonald 1988, Hayes et al. 2003), but wolves have not been limited by decreases in Chisana caribou due to the availability of moose and Dall's sheep. If there have been changes in densities of other prey species such as moose or sheep, wolves within the Chisana region may be affected. This may in turn also affect the CCH specifically.

Recommended Task	Who
Where possible, engage with academic institutions that may have interested graduate students and address research questions.	All
Identify available sources of funding that could be used to fund research in the CCH range, as needed.	All

Strategy 5.3: Consider doing one moose survey within the life of this plan

Changing vegetation patterns may affect both moose and wolf numbers in the area. Alaskan guides report more moose in the area and feel the wolves may be focusing on moose rather than caribou (T. Overly and U. E. Rayhol pers. comm.). The working group recommends that where possible, one moose survey be conducted within the life of this plan depending on available resources and overall jurisdictional priorities. This will provide some understanding of changes in the density of alternative prey species within the CCH range.

Recommended Task	Who
Consider doing one moose survey within the life of this plan	YG, ADFG, WSEPP
Analyze data and provide written summary of results	YG, ADFG, WSEPP
Compare results to recent census information from wolves and the CCH.	YG, ADFG, WSEPP

Public Awareness

Objective 6: Inform the public, First Nations, and key interest groups about the status of current initiatives, conservation, and population trends for the CCH.

Due to the international attention the CCH has received, as well as the recovery efforts of multiple individuals, governments, agencies, and First Nations, there is ongoing support and desire for the continued longevity and health of the herd. As such, there is a need to develop and communicate appropriate key messages at critical times for people or groups with an interest in the herd. These could include local communities, First Nations, tribal councils, outfitters, boards and councils, youth, non-government organizations, and the general public.

Strategy 6.1: Develop and implement a communication plan for CCH

Communication with the public regarding the status of the herd, past recovery efforts, and its potential vulnerability to harvest will support management of this herd. Critical times for implementing communication objectives would include when a hunt is initiated or closed and during new research or survey initiatives occurring within the CCH range. Engagement of the public through existing programs offered by the management authorities is an efficient way to do so. Additional work in communities near the herd's range will provide opportunities for local input to management.

Recommended Task	Who
Develop communication plan and identify target audiences and key messaging	All
Identify budgets and resources for implementing communication objectives	All
Share information about herd management.	All

Strategy 6.2: Coordinate awareness and communication, at critical periods, to the public and interested groups regarding harvest of the CCH

Communicating the rationale behind decisions to allow harvest of the CCH, or not, will be necessary in building awareness for the CCH and the cautious management approach that the management authorities are taking.

Recommended Task	Who
Develop and distribute appropriate communications to interested groups regarding the opening of a hunt on CCH	All
Develop and distribute appropriate communications to interested groups regarding the closure of a hunt on CCH	All

IMPLEMENTATION, REVIEW, AND REVISION

Objective 7: Implement the plan in a collaborative and timely manner.

To date, management of this herd has drawn on the collaborative efforts and shared interest to maintain a healthy herd size. For this plan to be effectively implemented, maintenance of the ongoing relationships that have been built through the recovery planning initiative, and subsequently in developing this plan, is required.

Strategy 7.1: Implement the plan in a manner that improves cooperation and communication among partners

The Chisana caribou herd is a shared resource—cooperation, communication, and trust will enhance our ability to manage the herd most effectively. Because management of the CCH is the responsibility of multiple management authorities, there is an opportunity to share resources and coordinate efforts among the different agencies. Further, where possible, volunteers will be engaged to support plan implementation.

Recommended Task	Who
Inform partnering management authorities regarding the availability of resources for implementing various sections of the plan including monitoring and research.	All
Communicate and share new information, as it may become available	YG, ADFG, WSEPP, TNWR

Strategy 7.2: Review and renew the plan in a timely manner

Plan reviews provide the opportunity for the management authorities to check in and revise management direction if needed, particularly if new information about the CCH is available. Reviews and implementation will include First Nations, Tribal Councils and local community groups. Where possible, volunteers will be included to further engage communities. A review is recommended at the end of five years of plan implementation. At that time, the plan may be extended upon mutual agreement by the management authorities.

Recommended Task	Who
Review the status of strategies included within this plan.	All
Renew or extend plan. Priorities and budgets should be identified during review.	All


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APPENDICES

Appendix A: List of Acronyms

ABOG	Alaska Board of Game
ADFG	Alaska Department of Fish and Game
AKNEP	Asi Keyi Natural Environment Park
ANILCA	Alaska National Interest Lands Conservation Act
CCH	Chisana Caribou Herd
CWS	Canadian Wildlife Service
DKRRC	Dan Keyi Renewable Resource Council
FSB	Federal Subsistence Board
KFN	Kluane First Nation
KWS	Kluane Wildlife Sanctuary
NMC	Northern Mountain Caribou
RAWS	Remote Automated Weather Stations
SARA	Species at Risk Act (Canada)
TNWR	Tetlin National Wildlife Refuge
WRFN	White River First Nation
WSEPP	Wrangell-St. Elias National Park and Preserve
UFA	Umbrella Final Agreement
USGS	U.S. Geological Survey
USNPS	U.S. National Park Service
USFWS	U.S. Fish and Wildlife Service
YFWMB	Yukon Fish and Wildlife Management Board
YG	Yukon Government

Appendix B: Working Group Participants

Name	Title	Affiliation
Torsten Bentzen	Assistant Area Wildlife Biologist	Alaska Department of Fish and Game
Tony Booth	Refuge Manager	Tetlin National Wildlife Refuge
Karen Clyde	Habitat Manager	Yukon Environment - Fish and Wildlife Branch
Jeff Gross	Area Wildlife Biologist	Alaska Department of Fish and Game
Troy Hegel	Caribou Biologist	Yukon Environment - Fish and Wildlife Branch
Chief David Johnny	Chief	White River First Nation
Peter Keller	Subsistence Biologist	Tetlin National Wildlife Refuge
Lorne Larocque	Kluane Fish and Wildlife Technician	Yukon Environment - Fish and Wildlife Branch
Amy Leach	Fish and Wildlife Planner (Casual)	Yukon Environment - Fish and Wildlife Branch
Christina Macdonald	Assistant Fish and Wildlife Planner (Casual)	Yukon Environment - Fish and Wildlife Branch
Geraldine Pope	Acting Director of Lands, Heritage and Resources	Kluane First Nation
Troy Pretzlaw	Kluane Regional Biologist	Yukon Environment - Fish and Wildlife Branch
Judy Putera	Wildlife Biologist	Wrangell-St. Elias National Park and Preserve
Greg Risdahl	Deputy Refuge Manager	Tetlin National Wildlife Refuge
Shawn Taylor	Kluane Regional Biologist	Yukon Environment - Fish and Wildlife Branch
Hank Timm	General Wildlife Biologist	Tetlin National Wildlife Refuge
Eric Veach	Chief of Natural and Cultural Resources	Wrangell-St. Elias National Park and Preserve

Appendix C:
Recommended Harvest Allocation

Conservation of the Chisana caribou herd and its habitat is the overriding principle of this management plan. Because of the recent recovery efforts to stabilize this declining population, a cautious approach is being recommended with respect to harvest of Chisana caribou. As per the Yukon woodland caribou management guidelines, an annual harvest of 2-3% is recommended for stable to increasing herds greater than 200 animals. These guidelines are currently under review and may be amended as recent information is assessed. Because of the cautious approach taken by the working group and the sensitive nature of the CCH, the extensive recovery effort, and public support for management of this herd, a bulls-only harvest not exceeding 2% of the estimated population is recommended for Chisana caribou, providing that the census and annual composition data indicate a harvest is sustainable. A bulls-only harvest is expected to have the least impact on potential herd growth.

Based on survey and telemetry data from 1979-2008, Chisana caribou are relatively evenly distributed in Yukon and Alaska. For this reason, the working group recommends that the maximum annual allocation of 2% should be evenly distributed among Yukon and Alaska, with a maximum of 1% of the estimated population to each jurisdiction.

In Alaska, the Chisana caribou herd would be primarily within Wrangell- St. Elias National Preserve during any potential harvest. Generally, both state harvest and federal subsistence harvest is permitted in the federal preserve. Management of wildlife in Alaska is a state responsibility, however on federal lands it must be done in concert with federal mandates, which includes a federal subsistence priority for local rural residents over all other consumptive uses. Therefore, state authorized hunting can only be allowed when the available harvest quota exceeds the level needed to provide for federal subsistence needs. For these reasons, the Chisana caribou hunts and harvest allocation within Alaska would be determined through the respective federal (Federal Subsistence Board) and state (Alaska Board of Game) regulatory processes.

Appendix D:
List of Management Plan Strategies

Strategy	Description	Recommended Tasks
1	Conduct regular monitoring of the herd	• Conduct a minimum of one herd census within the life of this plan. Aim to conduct first census in 2010. This task has been completed. • Conduct annual composition surveys except in years when a census is conducted. • Conduct 1-2 telemetry flights per year • Coordinate the recovery of collars from dead caribou during annual composition surveys or telemetry surveys • Coordinate the distribution of results summaries to working group members, USGS, and Environment Canada
2	Coordinate with research scientists in Alaska to determine a protocol for monitoring Chisana caribou	• Coordinate with USGS during the development of a monitoring protocol for the CCH. • Determine and identify available budget and staff resources • Implement and maintain a collaring and monitoring program for a minimum sample of animals as per the monitoring protocol.
3	Dependent on results of a 2010 census, coordinate efforts among management agencies to recommend a harvest for the CCH	• Based on 2010 census, working group will meet to determine if population trend and sex ratio meet the requirement to re-open the herd to hunting (Figure 3). • Should the population meet the required indicators, recommend to the responsible management authorities that the herd be permissible for harvest by 2011. This task is currently being completed by the respective management authorities. • Consider appropriate means for harvest allocation (see Appendix C for a proposed harvest allocation strategy). • If required, remove designation of the CCH as "Specially Protected" under Yukon's *Wildlife Act*.
4	Based on continued monitoring of the CCH, as per the monitoring schedule above, close all harvest of the CCH when herd population trends and sex ratios fall below threshold indicators for maintaining a stable or increasing herd	• As per monitoring schedule in Table 1, continue to monitor herd through annual composition counts and set herd censuses. • Determine from annual composition counts or censuses if the population falls below threshold indicators (Table 1) for a safe and sustainable harvest. • Close the harvest of CCH in Yukon and Alaska if the population has fallen below indicators.
5	Coordinate the collection of habitat information with other ongoing research and monitoring work in the CCH range	• When feasible, collect fecal pellets where possible during surveys or when recovering collars • When feasible, collect baseline vegetation data where possible during surveys or when recovering collars

Strategy	Description	Recommended Tasks
6	Encourage and take advantage of research opportunities to increase our current knowledge of habitat within the CCH range	• Where possible, engage with academic institutions that may have interested graduate students and address research questions. • Identify available sources of funding that could be used to fund habitat-related research in the CCH range, as needed.
7	Conduct one wolf census within the life of this plan	• Conduct survey of wolves in Yukon and Alaska portions of CCH range • Complete survey report and plain language document • Compare wolf census data with trends in CCH statistics.
8	Promote and take advantage of research opportunities within the CCH range	• Where possible, engage with academic institutions that may have interested graduate students and address research questions. • Identify available sources of funding that could be used to fund research in the CCH range, as needed.
9	Conduct one moose survey within the life of this plan	• Conduct one moose survey within the life of this plan • Analyze data and provide written summary of results • Compare results to recent census information from wolves and the CCH.
10	Develop and implement a communication plan for CCH	• Develop communication plan and identify target audiences and key messaging • Identify budgets and resources for implementing communication objectives • Share information about herd management.
11	Coordinate awareness and communication, at critical periods, to the public and interested groups regarding harvest of the CCH	• Develop and distribute appropriate communications to interested groups regarding the opening of a hunt on CCH • Develop and distribute appropriate communications to interested groups regarding the closure of a hunt on CCH
12	Implement the plan in a manner that improves cooperation and communication among partners	• Inform partnering management authorities regarding the availability of resources for implementing various sections of the plan including monitoring and research. • Communicate and share new information, as it may become available
13	Review and renew the plan in a timely and effective manner	• Review the status of strategies included within this plan. • Renew or extend plan. Priorities and budgets should be identified during review.

Appendix E:
Comments from Alaska Public Outreach

Public outreach meetings were held in Slana and Tok during June 2010 to allow comment on the Draft Management Plan for the Chisana Caribou Herd 2010-2015. Staff from Wrangell-St. Elias National Park and Preserve, Tetlin National Wildlife Refuge, and the Alaska Department of Fish and Game were present at each meeting. The meetings started with brief presentations on the draft plan, followed by comments and questions. Two members of the public attended the Slana meeting. Eleven members of the public participated in the Tok meeting. Copies of the draft plan were distributed to the Wrangell-St. Elias National Park Subsistence Resource Commission, the Southcentral Alaska Federal Subsistence Regional Advisory Council (RAC), the Eastern Interior Federal Subsistence RAC, the Ahtna Tene Nene' Customary and Traditional Use Committee, and local tribal councils. Written comments were also solicited through public announcements.

#	Organization/ Public Meeting	Comment	Response
1	Ahtna Tene Nene' Customary & Traditional Use Committee	• The Committee is opposed to any hunt of the CCH at this time. Should a hunt occur at a future time, federally qualified subsistence users should be given priority. • Traditional Ecological Knowledge (TEK) needs to be included prior to finalization of the plan.	• Specifics relating to hunting and allocation are beyond the scope of this draft Management Plan. Greg and Barb will be coordinating to conduct interviews with Northway Elders. • See Response to Comment #3 for further details about TEK inclusion.
2	Wrangell-St. Elias National Park Subsistence Resource Commission	• Supports the draft Chisana Caribou Herd Management Plan contingent upon the inclusion of Traditional Ecological Knowledge from those groups with a long history of use of this resource.	• See Response to Comment #3 for further details about TEK inclusion.
3	Slana, Alaska Public Scoping Meeting	• Rather than adding a section on Traditional Ecological Knowledge (TEK) to the Chisana Caribou Herd Management Plan, the working group could add TEK as another goal—to do a five year study to gather this information. More historic population data needed.	• Agreed that a new Action (now referred to as Strategy – see Response to Comment #5) on TEK be added (Management Objectives and Strategies - Research section). • Agreed that additional historic population data be added to the plan (Chisana Caribou Herd - Taxonomy and Range section).
4	Tok, Alaska Public Scoping Meeting	• Suggested that a section about the Burwash caribou herd be added to the plan as there may be some interchange between Burwash and Chisana herds. • Concern that Northway Tribal Council has not been involved enough in development of the plan. • A parturition survey should be done, pending the availability of funding. • Volunteers, including outfitting guides, could help do spring surveys and give the information to the agencies. • Suggested that the Chisana caribou hunt be made an 'International Hunt' by giving out a limited number of permits so that whoever got one could hunt in either the Yukon or in Alaska.	• Agreed that there was sufficient evidence to suggest that the Burwash and Chisana herds rarely, if ever, mix and, as a result, it was not necessary to include additional information on the Burwash herd. See Response to Comment #11 for Nelchina and Mentasta herds. • Greg and Barbara will be working together to increase involvement of the Northway Tribal Council through interviews with elders. The Council will be involved with annual reviews of the plan over the next 5 years. • Agreed that a parturition survey was not financially feasible and that the information collected from a single survey would not be of use. Rather, the four years of calving data collected during the Recovery Program should be summarized and included in the plan along with the historic population data (Chisana Caribou Herd - Current Status section).

4	Tok, Alaska Public Scoping Meeting		• Agreed that the role of volunteers in information collection would be acknowledged (Implementation, Review and Revision section - Objective 7). • Agreed that consideration of an International hunt is beyond the scope of the plan.
5	Slana, Alaska Public Scoping Meeting	• The purpose of the plan needs to be described more clearly as members of the public are confused.	• Agreed that a "Purpose of the Plan" section would be added before the "Developing the Plan" section.
6	Ahtna Tene Nene' Customary & Traditional Use Committee	• The CCH should have a management objective of no less than 2500+ before a hunt takes place on federal public lands and it should be open only to federally qualified subsistence users. • If there are not enough animals to meet subsistence needs a Section 804 analysis should be conducted. A drawing hunt could be used to allocate permits among those most dependent on the resource.	• Agreed that sex ratios and calf recruitment were better management measures than population objectives. The "Management Goal" section speaks to this as does Objective 2, Harvest, of the "Management Objectives and Strategies". • Specifics relating to hunting and allocation are beyond the scope of this plan.
7	Ahtna	• WSEPP should have a government to government relationship with Cheesh-na' Tribal Council and Mentasta Village Council. • Both councils should be actively involved in the management plan. The Ahtna Tene Nene' Customary & Traditional Use Committee should be included in the process of determining a hunt and the development of the Management Plan for the CCH.	• The WSEPP does have a government to government relationship with the Councils and has been providing them with updates. • Alaskan agencies have suggested including in the plan an Appendix of the public and Tribal Council comments. • Agreed to add "First Nations and Tribal Councils" as parties involved in the review and implementation of the plan (Implementation, Review, and Revision, Objective 7, Strategy 7.2).
8	Ahtna	• The herd size should be kept at no less than 2500 to keep the population stable.	• See Response to Comment #8
9	Ahtna	• The CCH intermingles with the Nelchina and Mentasta Herds – it is imperative to distinguish between the herds since neither the Nelchina and Mentasta herds are meeting ADF&G's management objectives for herd size.	• Agreed that information would be included on the genetic distinctness of Mentasta, Nelchina, Kluane and Chisana herds and on how these herds fit within larger context of Northern Mountain Caribou (Chisana Caribou Herd – Taxonomy and Range section).
10	Ahtna	• More research needs to be conducted on the CCH to determine the effects of disease and parasites.	• Additional information will be added (Chisana Caribou Herd – Health section).
11	Ahtna	• There should be a predator control management plan in place, or trapping of wildlife promoted, to keep the CCH at a sustainable population. Due to the high cost of access, subsidizing of gasoline and other related costs should be considered.	• Agreed that addressing predator control was beyond the scope of this plan and should be left to the discretion of individual land managers.
12	Ahtna	• The management plan does not include Ahtna people.	• See Response to Comment #4
13	Ahtna	• The Recovery Program should be continued so that the CCH will increase to 2500 animals.	• See Response to Comment #8
14	Ahtna	• Cheesh-na' and Mentasta Tribal Councils should be actively involved in the research conducted on the CCH. Traditional ecological knowledge needs to be included.	• See Response to Comments #3 and #9
15	Slana Public Scoping Meeting	• Leave the word "natural" out of the Management Goal to recognize the impacts/effects of humans on caribou.	• Accepted
16	Ahtna	• The 'Recommended Task' and 'Who' should include the Cheesh-na' and Mentasta Tribal Councils	• See Response to Comment #3
17	Ahtna	• The 'Recommended Task' and 'Who' should include the Cheesh-na' and Mentasta Tribal Councils	• See Response to Comment #3






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