2010 Mountain Caribou Census

CENTRAL SELKIRK MOUNTAINS

Leo DeGroot

British Columbia Ministry of Environment

Final Report May 2010

FIA Project 9100002

Summary

We conducted a complete census of the two sub populations of mountain caribou within their known range in the Central Selkirk Mountains March 5 – 18, 2010.

In the Nakusp sub population we located 65 adult caribou and 12 calves for a total of 77 caribou. In addition there were three occasions where tracks were spotted but caribou could not be found. These three groups of tracks should account for 5 – 8 caribou. This would put the Nakusp block at 82 – 85 caribou. The previous census (2008) reported 87 caribou based on the count and tracks where caribou could not be found.

In the Duncan sub population we spotted 7 caribou, none of which were calves. No other caribou tracks were found. This is down from 15 in 2008 based on the count plus tracks where caribou could not be found.

Confidence is high for the Nakusp sub population, but lower for the Duncan sub population. A heli-ski guide reported caribou tracks in two separate locations in the Duncan area one month prior to the census; however we found only one group. Regardless the total of 89 – 92 caribou suggests a relatively stable population since 2002, but at approximately one half of the numbers reported between 1996 and 1999. Calf recruitment, combined over the two sub populations, was 14.3% and within the range generally thought to be required for a stable population.

The large increase in forestry no harvest zones in the Central Selkirk Mountains in the past few years should significantly increase the probability that these caribou sub populations can be recovered in the long term. However displacement of caribou from preferred habitat by recreational activities remains a major concern. An altered predator / prey system largely due to past forest harvesting and other habitat changes is also a concern. This concern should diminish in time as the cutblocks regenerate. Meanwhile predator and alternate prey populations should be monitored and managed when and where necessary.

Introduction

Woodland caribou (*Rangifer tarandus caribou)* in southeastern British Columbia, northern Washington, and northern Idaho are a unique ecotype of caribou distinguished from other woodland caribou by their winter diet consisting almost exclusively of arboreal lichens. This trait allows them to inhabit the deep snow wet belt of the Columbia Mountains. These caribou are often referred to as ‘mountain caribou’. Due to their low, and over the longer term decreasing populations and shrinking and fragmented distribution, these caribou are considered endangered in the United States. In Canada, they are considered threatened by COSEWIC (Committee on the Status of Endangered Wildlife in Canada) and are provincially red-listed (species at risk of extinction or extirpation) by the British Columbia Conservation Data Centre.

Caribou were once distributed in a contiguous fashion throughout the Selkirk and Purcell Mountains of southeastern British Columbia (Stevenson and Hatler, 1985), (Spalding, 2000). In

recent decades the distribution has declined to several sub populations, one spanning the Central Selkirk Mountains, the northwest Purcell Mountains and the Duncan Valley. This was called the Central Selkirk sub population by Simpson et al. (1997), one of 13 sub populations of mountain caribou. The mountain caribou population has since been divided into 18 sub populations (Wittmer et. al., 2005). The Central Selkirk sub population was divided into the Nakusp and Duncan sub populations based on telemetry data. Telemetry data suggests that there is very little movement of caribou between the Nakusp and Duncan sub populations (Hamilton and Wilson, 2003).

Most of the caribou research in this area has occurred since 1992. Twenty three caribou were fitted with VHF radiocollars from 1992 – 2003 (Hamilton, 2008). Ten censuses have been conducted in both sub populations over the past 14 years, all in late winter when the caribou are consistently in the open forest at high elevations. The Nakusp sub population declined from an estimate of 211 caribou in 1997 to an estimate of 76 in 2007 and then increased to an estimate of 87 in the 2008 census. The Duncan sub population declined from an estimate of 26 to 9 in the same time period then increased to an estimate of 15 in 2008.

Study Area

The study area boundaries are described as the area bordered to the west by Arrow Lake, to the east by Kootenay and Duncan Lakes but including all of the Duncan Valley and the upper ends of adjacent drainages to the east north of Duncan Lake, to the south by Summit Lake, and extending north to Glacier National Park (Figure 1).

Methods

Standard survey protocols for mountain caribou (Resources Inventory Committee, 2002) were followed. This involved flying by helicopter at an elevational contour near treeline (1900 – 2200 m elevation) over all suitable caribou habitat in the area mentioned above. Attempts were made to conduct flights within a few days of a new snowfall so that recent tracks are visible but older tracks are covered up.

A fixed wing flight was conducted around the periphery of the study area in attempts to identify any expansion of range. This periphery flight included the Upper Bobbie Burns, Upper Spillimacheen, and the McMurdo watershed adjacent to the Duncan sub population and the Caribou, Goatcanyon, Shannon, Wragge and Slewiskin watersheds adjacent to the Nakusp sub population.

The helicopter was a 206 Long Ranger owned by Highland Helicopters (Nakusp base) and piloted by Mark Homis. The fixed wing airplane was a Cessna 337 owned by Silvertip Aviation (Revelstoke base) and piloted by Dave Mair. Observers were Paul Seaton, Leo DeGroot, Terry Anderson, and Albert Chirico.

When caribou tracks were observed they were followed until the animals were observed. We classified all caribou as either adults or calves. We did not attempt to classify adults by gender as it is difficult due to similarities between young males and adult females and, due to extended observation time, often results in additional physiological stress on the animals. High resolution

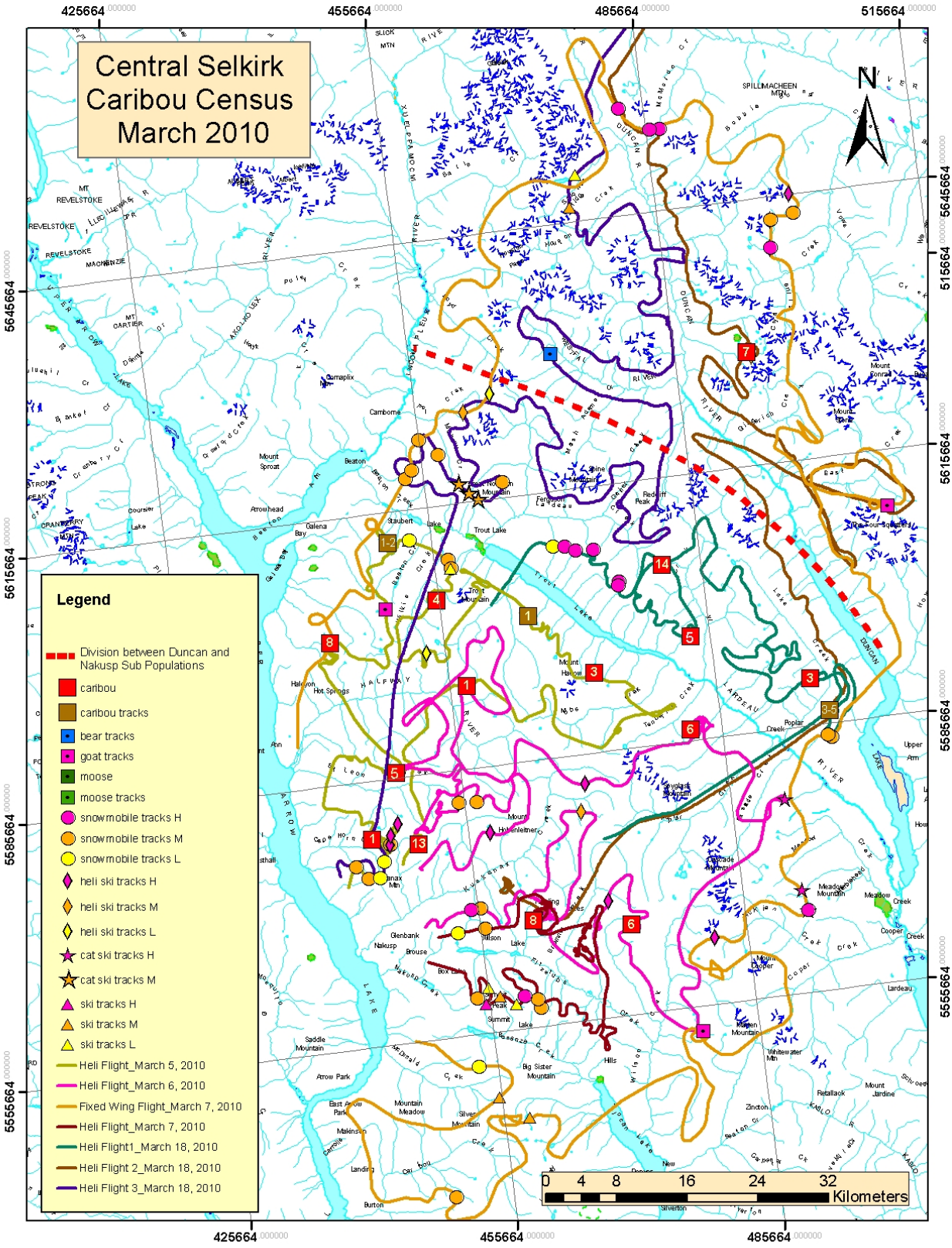

Figure 1. Flight lines, caribou sightings, other wildlife sightings and locations of snowmobile and ski tracks from the 2010 census. The groups of caribou are indicated by the red squares. The number of caribou in each group are indicated in the squares.

(3000 X 2008 pixel) photos of the groups of caribou were taken with a Nikon D50 digital SLR camera with a Nikon 70 – 300 mm zoom telephoto vibration reduction lens. Photos were later analyzed on a computer monitor to verify classification. If the caribou could not be found we estimated group size from the number of tracks and / or beds. Caribou tracks were only recorded if the caribou could not be found. Flight paths and caribou locations were recorded as Universal Transverse Mercator (UTM) coordinates using North American Datum 1983 (NAD83). Snowmobile, ski and other large mammal tracks were also recorded. The ski and snowmobile track records were limited to one per upper basin, which are usually 1 – 2 km across at the flight elevations.

Results

We spotted a total of 77 caribou in the Nakusp block, which included 12 calves. In addition there were three occasions where tracks were spotted but caribou could not be found. We estimated that these three groups of tracks accounted for 5 – 8 caribou. This would put the population for the Nakusp block at 82 – 85 caribou.

In the Duncan block we spotted 7 caribou, none of which were calves. No other caribou tracks were found.

The census was conducted during two separate weather windows. During March 5 – 7, 2010 we surveyed the area south of Trout Lake (approximately 70% of the Nakusp block) and we conducted the periphery fixed wing flight. During this time the weather was clear and calm, temperatures at 2000 meters elevation were approximately -2 degrees Celsius. Low amounts of recent snowfall resulted in a visible track record spanning several weeks. However approximately 4 cm of new snow on March 3 allowed us to identify tracks formed before and after that date. We considered Trout Lake and the Lardeau Valley a sufficient cut off point that caribou were unlikely to cross until the next weather window. We were not overly concerned about caribou movement between the time period of the fixed wing periphery flight and the helicopter flight north of this cut off point as any tracks sighted on the periphery flight would be re visited by helicopter.

The helicopter flying time for this area was 7.4 hours over three flights, of which 6.5 hours were on survey. All flights were based out of Nakusp. Average helicopter flying speed was 140 km / hr. The fixed wing periphery flying time was 2.5 hours over one flight. Average fixed wing flying speed was 240 km / hr.

The area north of Trout Lake / Lardeau Valley was surveyed on March 18, 2010. Sufficient snow to erase old tracks (30 – 50 cm) fell between March 10 – 12, with an additional 3-5 cm falling on March 17. The weather was partly cloudy with some wind the morning of the 18th, improving as the day progressed. Temperatures at 2000 meters elevation were approximately -5 degrees Celsius. The helicopter flying time was 6.8 hours over three flights, of which 4.7 hours were on survey. Refueling took place in Nakusp and Golden. Average helicopter flying speed was 135 km / hr.

On one of the survey approaches on March 18 we noticed caribou tracks in the Kuskanax where caribou were not observed during March 5 – 7. However upon finding the group (8 caribou) the presence of one collared animal suggests that it was the same group observed at Hamling Lakes (7

caribou) on March 7. The distance from Hamling Lakes was approximately 6 km. We checked the Hamling Lakes area to confirm that a group was no longer present there.

As the temperatures remained below 0^{o} Celsius for the duration of the census the new snow remained in the trees resulting in a smooth snow surface and excellent track sighting conditions. Snow water equivalent at the nearest snow pillow sites, St. Leon Creek (1822 m elevation) and East Creek (2004 m elevation) were at 78% and 81% of the means respectively for those dates (BC Ministry of Environment, 2010). Recent slab avalanche activity was widespread prior to both flying windows, often on slopes that appeared to be of very low angle. Snowmobile and heli-ski activity was abundant in many areas during the March 5 – 7 period, but not as abundant on March 18.

Recruitment

Twelve calves were identified. Recruitment is estimated to be 14.3% (12 of 84 animals).

Table 1. 2010 Nakusp block winter census results. Coordinates are given in UTM projection, Zone 11, NAD 83. Adults are considered to be older than twelve months of age, calves less than twelve months.

Date	Location	Caribou Sightings			Additional # Caribou based on tracks only	Easting	Northing	Comments
		Unclassified Adult Caribou	Calves	Total Caribou Sightings				
Mar 5	Cape Horn / St Leon	1	0	1	0	444828	5579128	bull
Mar 5	Halfway / St Leon	5	0	5	0	448448	5586287	
Mar 5	Nacillewaet	7	1	8	0	442918	5601777	
Mar 5	Hill	0	0	0	1-2	450814	5612201	
Mar 5	Wilkie	3	1	4	0	455446	5605105	Steep area
Mar 5	Asher Face	0	0	0	1	465572	5601966	
Mar 5	Craig	3	0	3	0	472130	5594723	Steep area
Mar 5	Gardner / St Leon	11	2	13	0	449923	5577943	
Mar 6	Halfway / Asher	1	0	1	0	457619	5595066	
Mar 6	Tenderfoot	4	2	6	0	482162	5586900	
Mar 6	Burkitt	6	0	6	0	472723	5565829	
Mar 7 & Mar 18	Hamling Lakes	6	2	8	0	461837 459324	5567678 5572155	One collar, group found twice, see results
Mar 18	SilverCup Ridge	3	2	5	0	483532	5597413	
Mar 18	Healy	13	1	14	0	481364	5605859	
Mar 18	Hope	2	1	3	0	496353	5590959	
Mar 18	Howser Ridge	0	0	0	3 - 5	498135	5587075	1st record in this area
Total		**65**	**12**	**77**	**5 - 8**			

Table 2. 2010 Duncan block winter census results. Coordinates are given in UTM projection, Zone 11, NAD 83. Adults are considered to be older than twelve months of age, calves less than twelve months.

Date	Location	Caribou Sightings			# Caribou based on tracks only	Easting	Northing	Comments
		Unclassified Adult Caribou	Calves	Total Caribou				
Mar 18	Hume	7	0	7	0	493923	5628501	
Total		**7**	**0**	**7**	**0**			

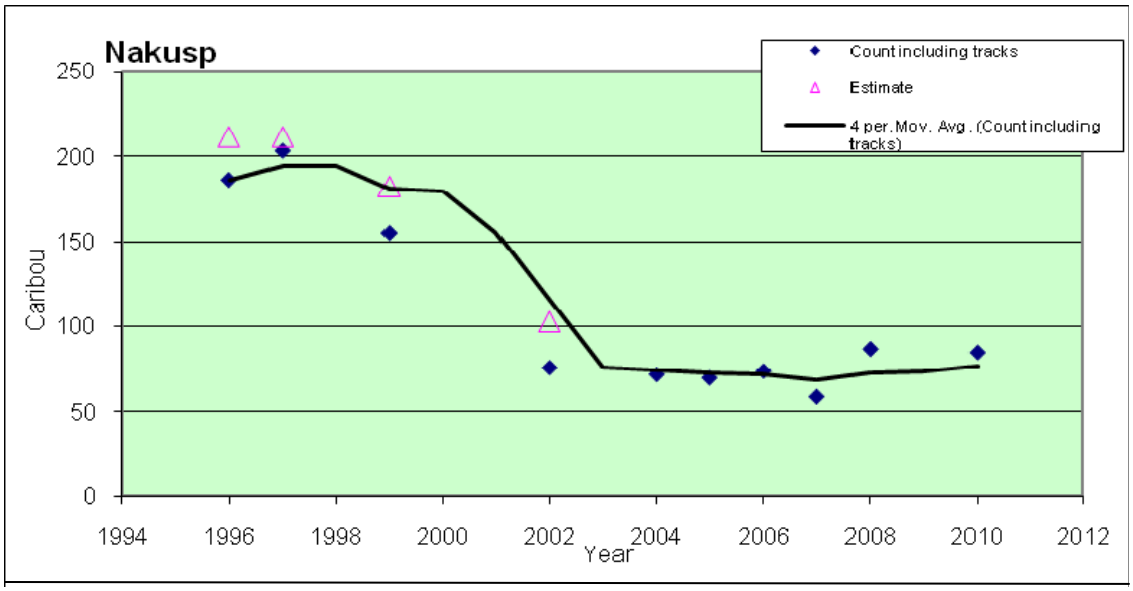

Figure 2. Nakusp sub population numbers from when census work began in 1996 to the present. Sufficient numbers of radio collared caribou from 1996 to 2002 allowed population estimates based on sightability. Blue triangles indicate the actual count plus an estimate of group size from tracks when caribou could not be found. The trendline is based on the count including tracks, averaged over several points.

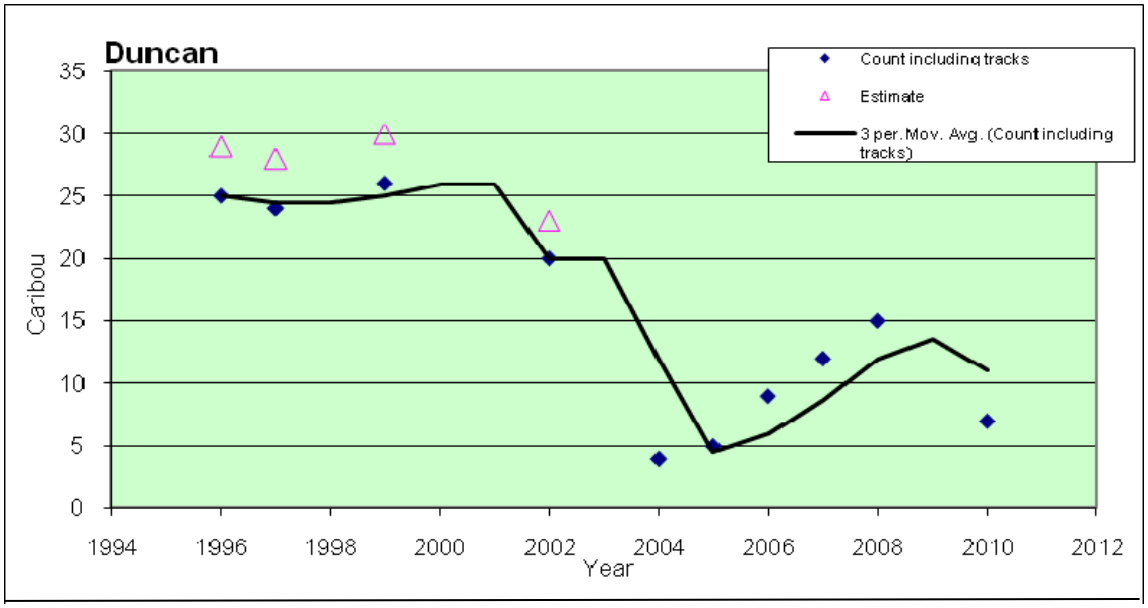

Figure 3. Duncan sub population numbers from when census work began in 1996 to the present. Sufficient numbers of radio collared caribou from 1996 to 2002 allowed population estimates based on sightability. Blue triangles indicate the actual count plus an estimate of group size from tracks when caribou could not be found. The trendline is based on the count including tracks, averaged over several points.

Discussion

Without any radio collared caribou, sightability corrections cannot be made. Caribou could have been missed on the flight routes or were using areas that we did not survey. We were however

consistent with previous surveys where every drainage either used by radio collared caribou or detected on other census flights during the late winter season since research began in 1992 were surveyed. Periphery areas were also surveyed. Excellent visibility and snow conditions made it less likely that caribou tracks on the flight routes were missed. Tracks from smaller animals such as hares and wolverines were readily visible. Therefore, we are fairly confident that all caribou tracks present at normal elevations in the census area were detected. However, caribou have been found to use lower elevations during lower than normal snowpack years (Flaa and McLellan, 1999, Kinley et. al., 2007).

In the Nakusp sub population the estimate of 82 – 85 caribou is similar to the estimate of 87 from the previous census (Hamilton, 2008) and indicates a stable population subsequent to the large decline that took place between 1998 and 2002. There is the chance that we could have missed a group but with the consistent number from the last census and the fact that all groups reported by heliski operators in the area were found, we are fairly confident in the result. Notable observations were the lack of caribou on Ranch Ridge and the presence of caribou on Howser Ridge.

The result of one group of 7 caribou in the Duncan sub population is down from four groups and an estimate of 15 in 2008 (Hamilton, 2008). However, a heli-ski operator in the area reported tracks from groups in two separate locations earlier in February. Telemetry records also show caribou occasionally using much lower elevations near the end of March and into early April in this area. There is a higher chance that a group of caribou had moved to lower elevations prior to our survey and were missed. We discussed surveying the lower elevations in this area, but due to the low sightability in dense forest and likelihood of confusion with moose tracks, we decided against this.

While there were no calves among the 7 caribou in the Duncan, the overall calf recruitment figure of 14.3 % is promising and within the suggested 12% - 16% recruitment that is required for a stable population (Bergerud, 1996).

Displacement of caribou from preferred habitat by recreational disturbance is a concern in many areas. In particular, the Great Northern Mountain / Mohawk Creek area, the majority of Silvercup Ridge, and the Harlow Creek basin in the Nakusp block and the Silent Pass area in the Duncan block. These areas contain suitable but unused late winter habitat that is heavily used by snowmobilers and/or snowcat operators.

The increase in no harvest zones in the Central Selkirk Mountains since 2008 should significantly increase the probability that these caribou sub populations can be recovered in the long term. However, an altered predator/prey system largely due to past forest harvesting and other habitat changes remains a significant concern. This concern should diminish as cutblocks regenerate. Meanwhile, predator and alternate prey populations should be monitored and managed when and where necessary.

Acknowledgements

This census was funded by BC Timber Sales through the Forest Investment Account. Spotters were Paul Seaton, Terry Anderson, Albert Chirico, and Leo DeGroot. Pilots were Mark Homis and Dave Mair. Mike Knapik was the quality assurance auditor.

References

Bergerud, A.T. 1996. Evolving perspectives on caribou population dynamics, have we got it right yet? Rangifer Spec. Issue, **9**: 95–116.

BC Ministry of Environment, 2010. Kootenay snow survey data, British Columbia Ministry of Environment, Water Stewardship Division. http://www.env.gov.bc.ca/rfc/river_forecast/kootenay.html

Flaa, J., and B. McLellan. 1999. Population characteristics of Lake Revelstoke caribou. Prepared for Biology and Management of Species at Risk Conference, Kamloops, BC

Hamilton, D. 2008. 2008 Population census of mountain caribou in the central Selkirk mountains of southeastern British Columbia. Prepared for BC Timber Sales, Pope and Talbot Ltd., and Canadian Mountain Holidays, Nelson and Nakusp, British Columbia

Hamilton, D., and S. Wilson. 2003. Central Selkirk mountain caribou habitat model. Prepared for Slocan Forest Products, Meadow Creek Cedar Company, BC Timber Sales, BC Ministry of Water, Land, and Air Protection. Kootenay Region, British Columbia

Kinley, T.A., T. Goward, B.N. McLellan, and R. Serrouya. 2007. The influence of variable snowpacks on habitat use by mountain caribou. Rangifer Special Issue 17: 93-102.

Resources Inventory Committee. 2002. Aerial-based inventory methods for selected ungulates: bison, mountain goat, mountain sheep, moose, elk, deer and caribou. Version 2.0 Standards for Components of British Columbia's Biodiversity No. 32, Ministry of Sustainable Resource Management, Victoria, British Columbia.

Simpson, K., E. Terry, and D. Hamilton. 1997. Toward a mountain caribou management strategy for British Columbia – habitat requirements and sub-population status. Wildlife Working Report No. WR-90, Ministry of Environment, Lands and Parks, Victoria, British Columbia.

Spalding, D. J. 2000. The early history of woodland caribou (*Rangifer tarandus caribou*) in British Columbia. Wildlife Bulletin No. B-100, Ministry of Environment, Lands and Parks, Victoria, British Columbia.

Stevenson, S. K., and D. F. Hatler. 1985. Woodland caribou and their habitat in southern and central British Columbia. Volume 1. Land Management Report Number 23, Ministry of Forests, Victoria, British Columbia

Wittmer, H. U., B. N. McLellan, D. R. Seip, J. A. Young, T. A. Kinley, G. S. Watts, and D. Hamilton. 2005. Population dynamics of the endangered mountain ecotype of woodland caribou (*Rangifer tarandus caribou*) in British Columbia, Canada. Canadian Journal of Zoology 83: 407-418.