

2005 POPULATION CENSUS OF MOUNTAIN CARIBOU IN  
THE CENTRAL SELKIRK MOUNTAINS OF  
SOUTHEASTERN BRITISH COLUMBIA

Prepared for:  
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## Introduction

Mountain caribou (*Rangifer tarandus*) are a species at risk in British Columbia. A telemetry study of the Central Selkirk subpopulation was conducted from 1992-2002 (Figure 1). It included aerial monitoring of animals equipped with VHF radio transmitter collars, population censuses in 1995, 1997, 1999, 2002, winter trailing of caribou, habitat field sampling and data collection, and investigation of collared-caribou mortalities. A census was also undertaken in 2004 after the telemetry study had ended.

Resource selection function and expert-based habitat models were developed from the telemetry, census, and field data collected as part of the study. Multiple logistic regression analysis was used to examine resource selection at several spatial scales (Hamilton *et al.* 1999, 2000) and an ecosystem-based species-habitat modelling approach (RIC 1999) was used to rate and map individual ecosystem units (1:20,000 scale) for their current habitat suitability and potential habitat capability value for mountain caribou (Hamilton and Wilson 2003).

Inventory and habitat mapping results as well as local knowledge gained during the study were used to develop a caribou-focused landscape unit management plan for the Central Selkirks. The plan includes landscape-level management zoning (no harvest, interim deferral and caribou special management zones), operational field sampling and reporting procedures that require field-based assessments of caribou use and habitat value in advance of forestry activities, and a monitoring and adaptive management strategy to assess overall plan implementation and effectiveness (Landscape Unit Planning Working Group 2002, Hamilton *et al.* 2004). Inventory results were also applied to an investigation of cumulative effects of forestry and mechanized backcountry recreation on the Central Selkirk mountain caribou subpopulation (Wilson and Hamilton 2003).

As part of the ongoing monitoring of the Central Selkirk subpopulation, we present results from the 2005 mountain caribou census.

Funding for the Central Selkirk mountain caribou census was provided by Canadian Forest Products (Slocan), Pope & Talbot Ltd. (Nakusp), Canadian Mountain Holidays (Banff) and Parks Canada (Revelstoke).

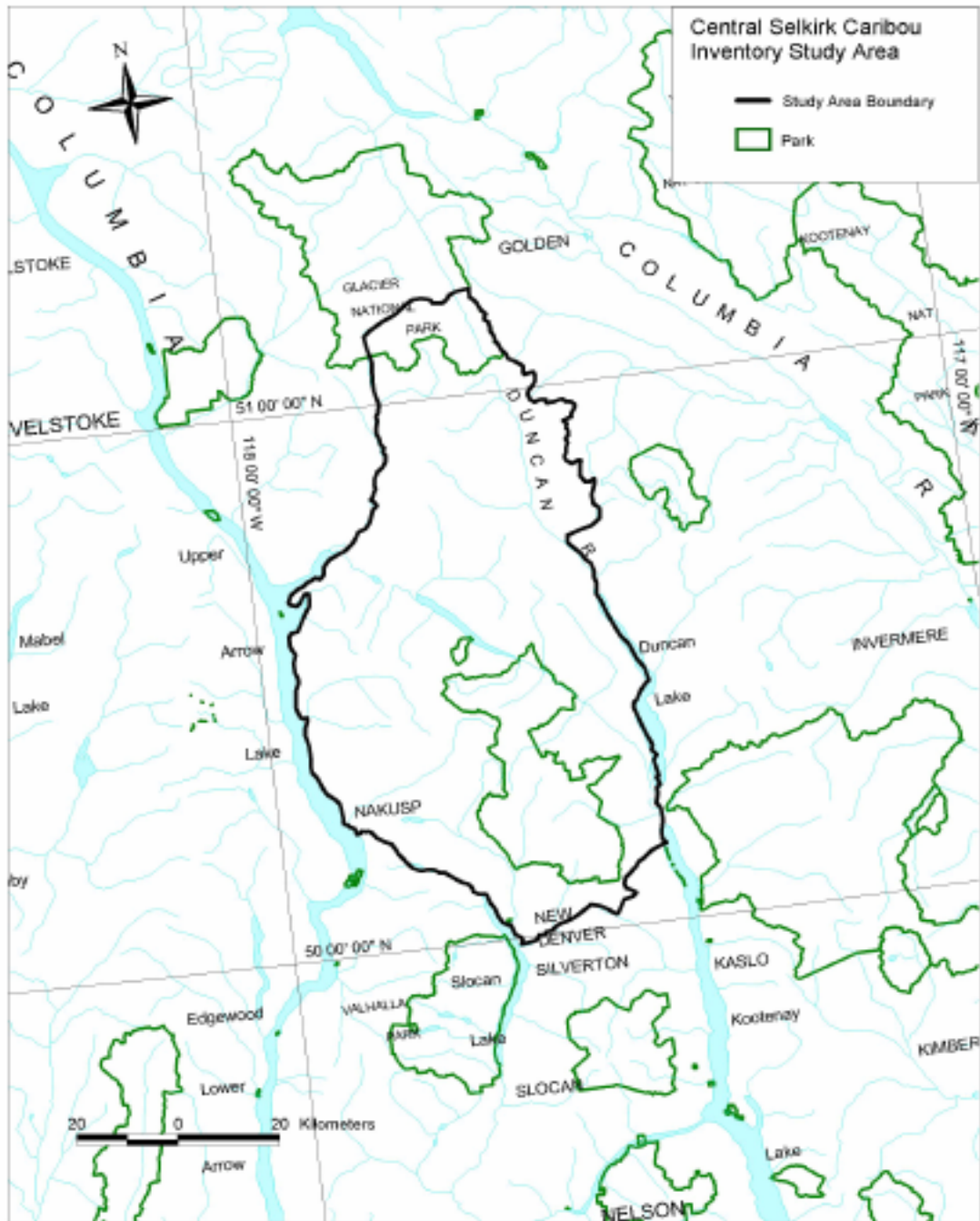


Figure 1: Central Selkirk mountain caribou study area.

## Methods

The census was preceded by a fixed wing reconnaissance of the periphery of the study area on 9 April 2005. The purpose of the fixed-wing flight was to determine snow conditions and the likelihood that caribou were at high elevations, and to survey areas outside the traditional census boundaries that may have been occupied by mountain caribou.

The population census was conducted on 10 and 14 April 2005 in accordance with aerial-based inventory methods outlined by Resource Inventory Standards Committee (RISC 2002). The >600,000 ha study area was divided into Nakusp and Duncan census blocks, with each block requiring one full day to census by helicopter. Flight paths were similar to those used in previous years (Figure 2; Hamilton 2004). The census was completed by three experienced observers plus the pilot. The area was surveyed following a fresh snowfall.

Because mountain caribou in the Central Selkirk Mountains are typically found in high-elevation subalpine areas in late winter (Hamilton et al. 1999, 2000), timberline/alpine contours were followed using a Bell 206 helicopter. Helicopter speed and altitude varied along established flight paths. When tracks or caribou were seen, the helicopter left the flight path until animals were located and counted. If the animals were not located, the number of tracks was recorded. Adults and calves were counted separately. Each caribou group or individual observation was assigned an identity number and the location was recorded using an onboard GPS.

## Results and Discussion

A total of 59 adult caribou and 16 calves were observed during the 2 day helicopter census (Figure 2; Table 1). In addition, nineteen caribou tracks were observed. No caribou were observed on the fixed-wing flight of the periphery of the study area.

A conscious effort was made during the census flights to minimize stress to animals. Consequently, when following tracks failed to locate caribou (usually because animals had moved into forest), we did not attempt to “flush” animals from cover and simply recorded observations as “tracks.”

The total number of mountain caribou counted (observed plus tracks) during the 2005 census was similar to 2004, following consistent declines during 1996-2002 (Figure 3).

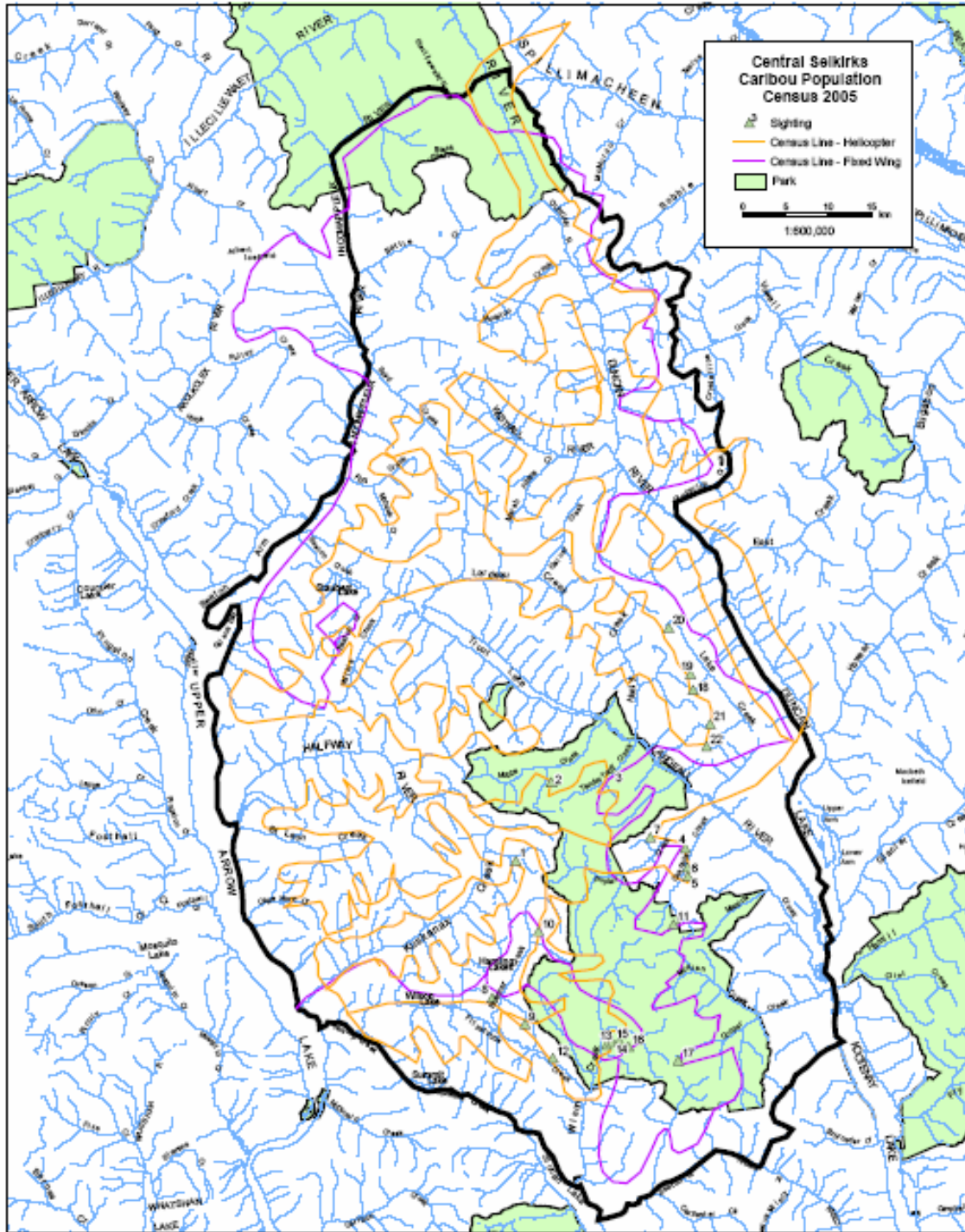
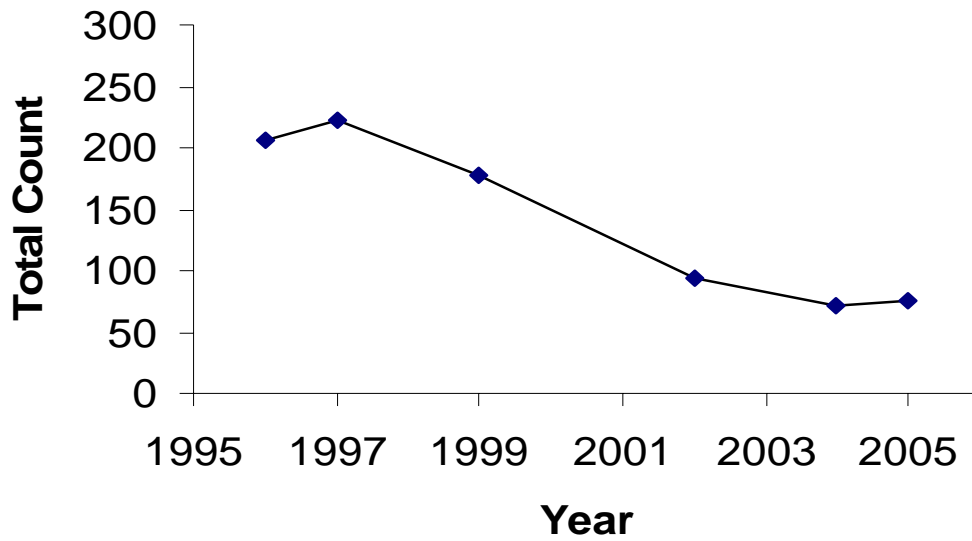


Figure 2: Mountain caribou population census flight-lines and observations for the Central Selkirk Mountains (2005).



**Figure 3: Total count (observed and tracks) of caribou observed during censuses in the Central Selkirks (1996-2005).**

**Table 1: Results of the 2005 mountain caribou census for the Central Selkirk subpopulation.**

Sighting	Adults	Calves	Total	Tracks only
<b>Nakusp Census Block</b>				
1	8	3	11	
2				1
3				1
4	6	3	9	
5	3	1	4	
6	1		1	
7	2		2	
8	3		3	
9	7		7	
10				6
11				3
12	2		2	
13	6	3	9	
14	2		2	
15	7	5	12	
16	5	1	6	
17	2		2	

Sighting	Adults	Calves	Total	Tracks only
<b>Duncan Census Block</b>				
18	1		1	1
19	3		3	
20				3
21	1		1	
22				4
	59	16	75	19

Population estimates based on census data from 1996 to 2002 included both total counts of animals observed and mark-resight population estimates with 90% confidence intervals (White 1996). There are now no known functioning collars left in the Central Selkirk subpopulation.

During censuses when functioning collars were available, 55 of 61 collared caribou were observed, a sightability of 90%. Hooge *et al.* (2004) reported an average sightability of 92% during all mountain caribou censuses conducted in the Columbia Forest District. This suggests that censuses on unmarked mountain caribou subpopulations can provide a reliable index of population size and trend.

Census data suggest that the population of mountain caribou in the Central Selkirk Mountains has remained stable between 2002 and 2005 (Table 2); however, the number of animals observed during censuses has decreased from 93 in 2002 to 72 and 75 in 2004 and 2005 respectively. Coincidentally, the number of caribou tracks has increased proportionately.

**Table 2. Total number of mountain caribou observed (with % calves), tracks counted, and mark-resight population estimates and confidence intervals for the Central Selkirk subpopulation (following Hooge et al. 2004).**

Year	Observed (%calves)	Tracks	Observed + Tracks	# Active Collars	# Collars Observed	Population Estimate	90%CI
1996	211(12)	19	230	12	13	268	230-354
1997	223 (8)	9	232	23	22	231	223-266
1999	181 (9)	17	198	17	14	213	190-266
2002	93 (22)	4	97	9	6	131	105-207
2004	72 (22)	16	88	-	-	-	-
2005	75 (27)	22	97	-	-	-	-

Mark-resight population estimates declined every year from 1996-2002, although only in 2002 was the change from the 1996 estimate statistically significant (Table 2). The number of mountain caribou observed during censuses dropped from 211 in 1996 to 75 in 2005 – a 65% decline.

The decline in adult caribou and the low number of calves observed in 1997 and 1999 followed a deep snow event in the Central Selkirks in the winter of 1996/97. Calves comprised <10% of the total number of caribou observed in 1997 and 1999, but more recently the proportion of calves has exceeded 20% and in 2005 was the highest ever observed (27%).

No caribou but 4 sets of caribou tracks were observed in the Duncan census block during the 2004 census. The 2005 census located 5 adult caribou and 8 sets of tracks, but no calves. Few caribou (<30) have typically been observed in the Duncan during census flights.

Other wildlife observed during the mountain caribou census included 1 grizzly bear den (Burkit Cr.), 1 grizzly bear sighting (Duncan R.), 5 sets of grizzly bear tracks, 2 wolverine sightings (Newbrant Cr. and Duncan R.), and several moose (Duncan R.).

## **Recommendations**

Concern has been expressed regarding stresses to caribou associated with capture and radio-collaring that can result in direct mortality (Hamilton and Wilson 2002). There is also anecdotal evidence that captures can sensitize animals to future disturbances by aircraft and can create additional stresses that might last for years. If the primary goal of deploying additional radio collars is to improve the reliability of population estimates, a lower cost and likely reliable alternative is to develop and apply a sightability correction based on a model developed from data collected on past censuses of marked subpopulations.

A census of the Central Selkirk Mountain subpopulation should be conducted each year to support provincial mountain caribou recovery planning efforts and ongoing operational planning and monitoring at the local level. A continuation of the existing partnership funding should be encouraged.

Efforts to recover mountain caribou in the Central Selkirks should continue to involve collaborations between the forest industry, backcountry recreation users and government.

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