

Winter distribution and abundance of mountain caribou in relation to habitat management zones in the Robson Valley: Project report

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Abstract

The purpose of this project was to determine the winter distribution and abundance of mountain caribou (*Rangifer tarandus caribou*) in the Robson Valley Forest District in relation to management zones established to protect their habitat. A caribou census was undertaken by aerial surveys in March of 2000, 2001, and 2002. In each of the three years, 24 caribou were counted; however, the number of caribou using different parts of the District varied among years. The Robson Valley was not a core area for mountain caribou, but appeared to provide peripheral habitat that was used in some winters by caribou from herds that were more abundant outside the District boundary. This project report provides recommendations to refine the boundaries of some caribou habitat management zones and highlights the need to delineate a new zone in the Camp Creek area.

KEYWORDS: *Rangifer tarandus caribou, Robson Valley Forest District, mountain caribou winter distribution, mountain caribou abundance, mountain caribou management zones.*

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Introduction

The Robson Valley in east-central British Columbia (Figure 1) provides habitat for both the “mountain” and the “northern” woodland caribou ecotypes (*Rangifer tarandus caribou*) (Stevenson and Hatler 1985). Throughout most of the year, mountain caribou live in high-elevation forests within the Engelmann Spruce–Subalpine Fir (ESSF) biogeoclimatic zone, and in the alpine. In winter they feed primarily on arboreal lichens, which are most abundant in old forests. Forest harvesting and other stand-destroying events such as wildfire reduce the amount of old-forest habitat and therefore decrease the amount of forage available to caribou. Forest harvesting and road building may also harm caribou populations by disrupting predator–prey relationships, which may lead to increased levels of predation on caribou (Seip 1998). Consequently, at the time of this study, substantial portions of the Robson Valley Timber Supply Area had forest management restrictions in place to protect caribou habitat (see Figure 1). These habitat management zones included:

- “Caribou High Zones” (20 259 ha), where no forest harvesting was permitted; and
- “Caribou Medium Zones” (15 597 ha), where extended rotations and partial cutting were required (B.C. Ministry of Forests 1994).

In general, Caribou High Zones were at upper elevations that are highly preferred by caribou throughout the year, and Caribou Medium Zones occurred at mid-elevations that are used by some caribou in early winter.

Northern ecotype caribou use alpine areas in summer for calving and feeding. In winter, these caribou feed on terrestrial lichens, either in windswept alpine areas or in low-elevation pine forests. Some northern ecotype caribou use alpine habitat in the eastern part of the Robson Valley in summer, but in winter they migrate to low-elevation ranges in Alberta (Brown and Hobson 1998). These caribou pose less of a forest management concern within the Robson Valley, but the potential exists for disturbance related to improved road access, or disruption of predator–prey relationships on their calving and summer range due to the creation of habitat for early seral ungulates (Seip 1998).

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woodland caribou is expressed in the Robson Valley Land and Resource Management Plan (B.C. Ministry of Sustainable Resource Management 1999). Provincially, mountain caribou are designated a “red-listed” species, which means they are considered threatened or endangered within British Columbia (B.C. Ministry of Sustainable Resource Management 2003). Nationally, all caribou occurring within the Robson Valley are listed as “threatened,” as part of the “Southern Mountain National Ecological Area” caribou population (Mountain Caribou Technical Advisory Committee 2002).

At the time of this study, the number of caribou living in the Robson Valley and their contribution to the total provincial mountain caribou population was not known. Concerns also existed about the location of the established habitat management zones. The objective of this project was to determine the abundance of mountain caribou in the Robson Valley Forest District¹ during winter, and evaluate whether the existing habitat management zones were located in the appropriate areas to provide winter habitat.

Methods

In March of 2000, 2001, and 2002, we surveyed caribou distribution and abundance using the standard approach for conducting mountain caribou censuses in British Columbia (Seip 1992a; Resources Inventory Committee 2002). Previous radio-telemetry studies showed that virtually all mountain caribou use subalpine parkland habitat during March (Seip 1990, 1992a; Terry *et al.* 2000).

Caribou or caribou tracks were located by flying in a helicopter along the subalpine treeline. When tracks

¹ Following the 2002 B.C. Ministry of Forests reorganization, the Robson Valley Forest District (previously part of the Prince George Forest Region) was combined with the Clearwater Forest District to become the Headwaters Forest District of the new Southern Interior Forest Region.



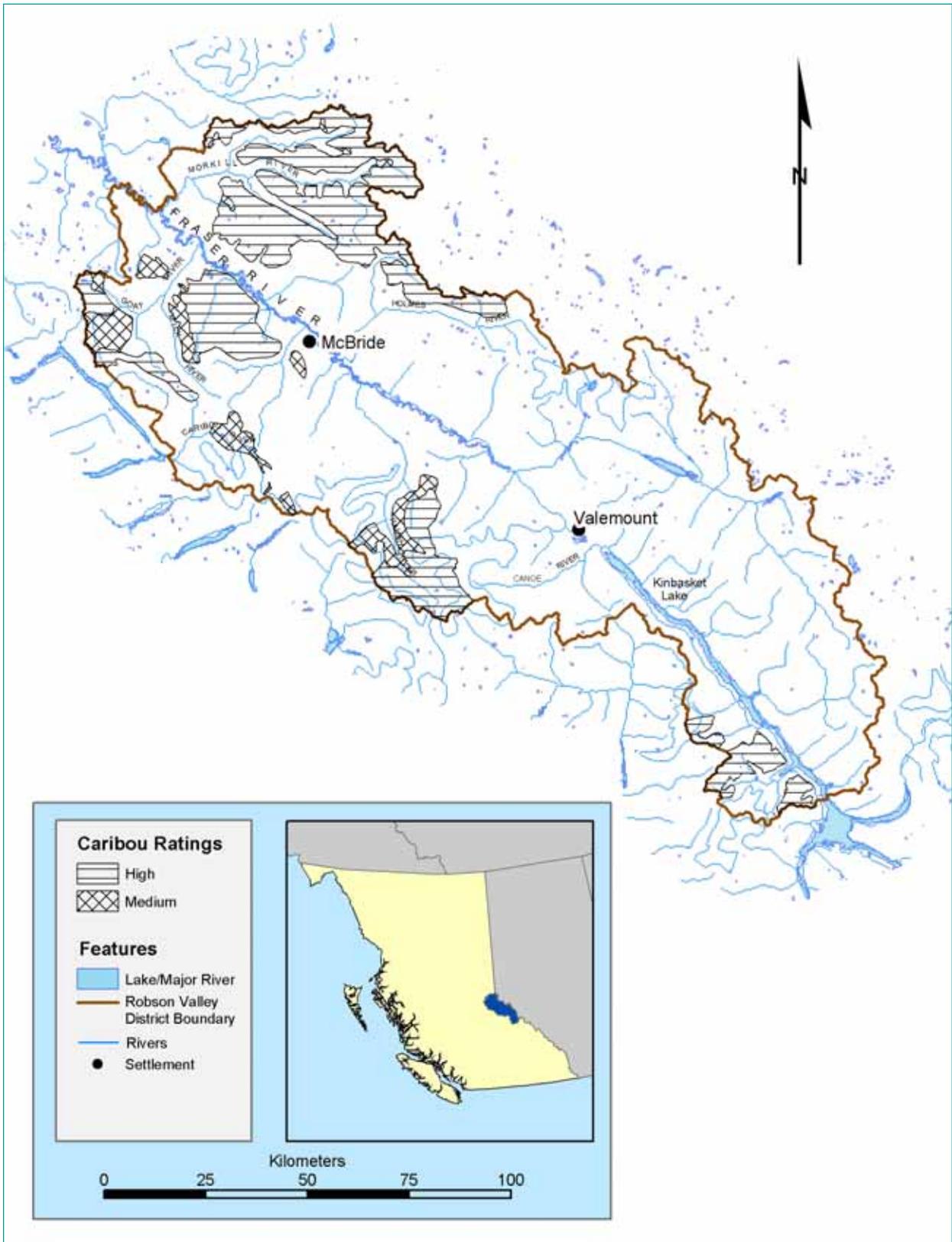


FIGURE 1. Caribou habitat zones in the Robson Valley at the time of this study, 2000–02.

were seen, the area was searched until the caribou were located. The animals were then counted and classified as adults or calves. The co-ordinates of all locations were recorded using a Global Positioning System device.

Year 2000 Survey

The surveys in 2000 provided almost complete coverage of the Robson Valley Forest District, and included all areas that had caribou habitat management zones, and all areas where caribou had recently been reported (Figure 2).

We completely surveyed all watersheds in Robson Valley Forest District west of the Rocky Mountain Trench except for the Cariboo and the Betty Wendle. The Cariboo and Betty Wendle watersheds drain to the west and are included in the Bowron Caribou Census Block, which was surveyed by B.C. Ministry of Environment, Lands and Parks staff from the Cariboo Region. On the east side of the Trench, all watersheds in the Mount Rider area were searched, including the La Salle, Fleet, East Twin, McKale, Cushing, and Hellroaring. All of the Forgetmenot watershed was surveyed as well as the Morkill River up to Renshaw Creek. The Holmes

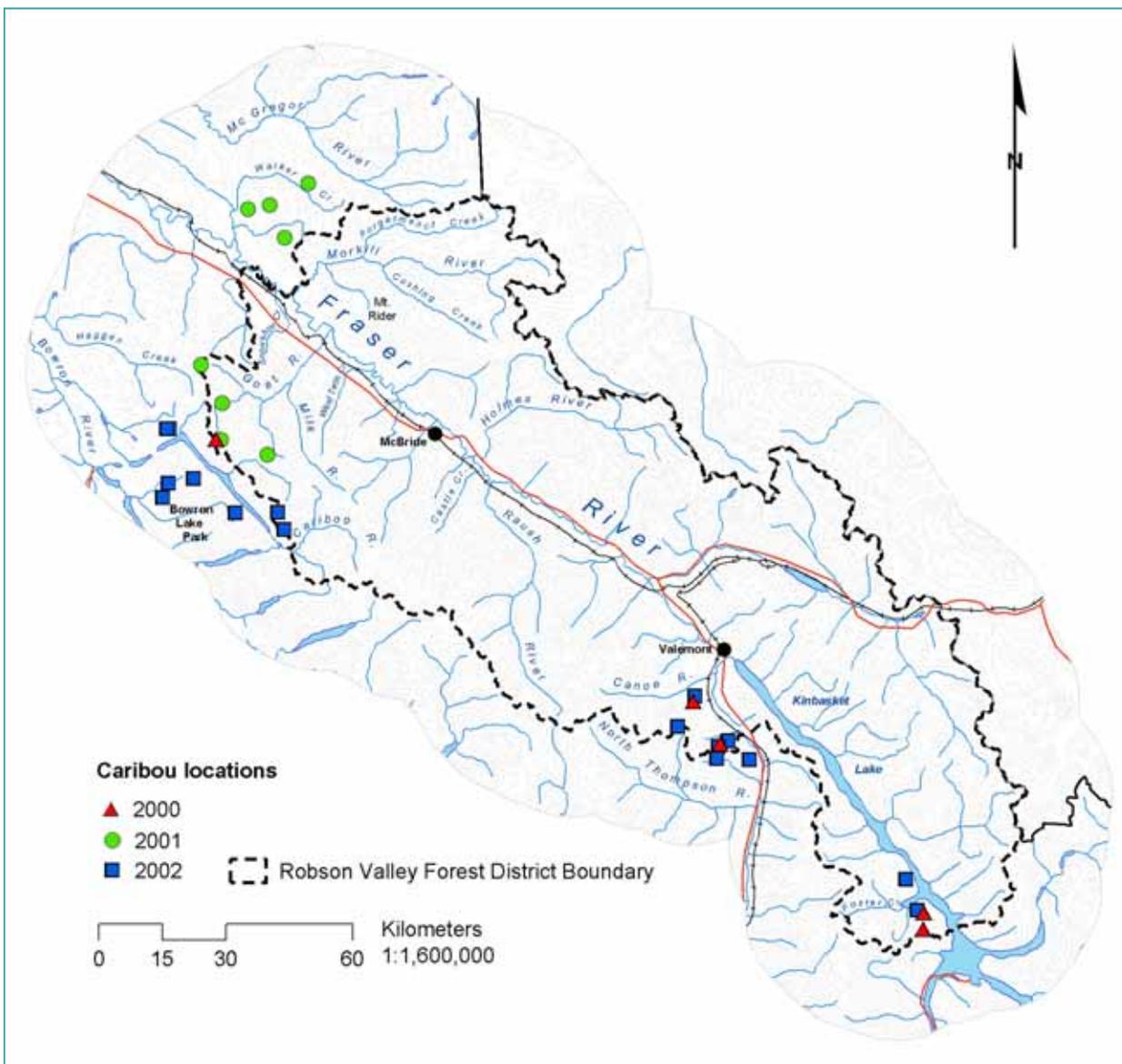


FIGURE 2. Locations of caribou in the Robson Valley Forest District and vicinity during March censuses (2000–2002).

watershed was not surveyed because much of the mature forest habitat was recently eliminated by wildfire. The watersheds south of the Holmes, including the Horsey and the Small, were surveyed down to the Fraser River. Most watersheds were surveyed March 6–8, but the Mt. Rider area was surveyed on March 21.

The remaining watersheds to the south, including the Fraser and the Swift, and the watersheds east of Kinbasket Reservoir are very steep and have no record of caribou in recent times. Because of insufficient funds, these low-priority watersheds were not surveyed.

Year 2001 Survey

In 2001, we undertook a more focused census by surveying all areas that had been mapped as Caribou High and Caribou Medium habitat along with the adjacent watersheds. In addition, we surveyed areas not previously mapped as caribou habitat, but that had caribou present in March 2000. The Walker and Bastille creek areas in Prince George Forest District were also surveyed because of their adjacency to Caribou High habitat in the northeastern portion of the Robson Valley Forest District.

Our surveys were conducted on the following dates.

- March 14: Swift Creek, Camp Creek, Canoe River, upper Rausch River, Castle Creek, and west side of Kinbasket Reservoir
- March 20: Dore River
- March 22: West Twin Creek, the Goat River system, and the Mt. Rider area between the Rocky Mountain Trench and Cushing Creek
- March 26: Morkill River and Walker Creek areas

Year 2002 Survey

In 2002, we again focused on the areas that had recent caribou sightings, or were mapped as caribou habitat. We also surveyed the caribou populations north and east of the Robson Valley Forest District to evaluate the distribution of the caribou herds that extend into the District.

Our surveys were conducted on the following dates.

- March 5: Walker Creek area between the Torpy and Morkill; watersheds in Mt. Rider area between Fraser River and Cushing Creek, including the Hellroaring, LaSalle, Fleet, and East Twin
- March 6: watersheds west of Fraser River and north of Dore River, including the Boreal, West Twin, Milk, Goat, and Snowshoe

- March 18: watersheds west of Kinbasket Reservoir; Camp Creek and Canoe River

Results

In 2000, 24 caribou were detected during the survey (Table 1). Four caribou were counted in the upper Goat River watershed, 8 caribou in the Foster Creek watershed, and 12 caribou in the Camp Creek–Canoe River watersheds (Figure 2). The observed sample contained 19 adults and 5 calves, for a ratio of 26 calves per 100 adults, or 21% calves in the population.

In 2001, 24 caribou were counted within the Robson Valley Forest District, and an additional 26 caribou were counted in the Walker Creek area north of the district boundary. Within the District, all caribou observed were in the headwaters of the Goat River watershed, including the North Star and McLeod tributaries. These included 20 adults and 4 calves, for a ratio of 20 calves per 100 adults, or 17% calves in the population.

In 2002, 24 caribou were counted in or immediately adjacent to the Robson Valley Forest District. Twelve of these were slightly beyond the district boundary when they were located, but their tracks had originated from within the District. Five caribou were located in Foster Creek and the other 19 were in the Camp Creek–Canoe River area. Twenty-one adults and three calves were counted, for a ratio of 14 calves per 100 adults, or 12.5% calves in the population.

During the 2002 survey, the following additional caribou were detected outside the District:

- 3 caribou south of the District at Allen Creek
- 14 caribou north of the District in the Walker Creek area
- 202 caribou northwest of the District in the Sugarbowl–Haggen Creek area

Additional caribou locations from Bowron Park were provided by B.C. Ministry of Water, Land and Air Protection personnel at Williams Lake, B.C. (Jim Young, pers. comm., 2002).

Discussion

Twenty-four caribou were counted in the Robson Valley Forest District during March surveys in each of the three years. However, it is unlikely that these were the same animals, as each year the distribution differed. Studies with known numbers of marked caribou in the survey area have demonstrated that about 83% of the total caribou population is detected during March surveys



TABLE 1. Location of caribou detected in the Robson Valley Forest District and vicinity during March surveys (2000–2002)

Year/Location	Adults	Calves	Total
2000 (District)			
Upper Goat River	2	2	4
Foster Creek	7	1	8
Camp Creek	6	2	8
Canoe River	4	0	4
Total	19	5	24
2001 (District)			
North Star Creek	1	1	2
Upper Goat River	10	2	12
McLeod Creek	9	1	10
Total	20	4	24
2001 (vicinity)			
Walker Creek area	23	3	26
2002 (District)			
Foster Creek	5	0	5
Camp/Canoe/Kimmel	16	3	19
Total	21	3	24
2002 (vicinity)			
Allen Creek	3	0	3
Walker Creek area	11	3	14
Sugarbowl–HaggenCreek	182	20	202
Total	196	23	219

(Seip 1990, Young and Roorda 1999). Applying this correction factor yields a population estimate of 29 caribou for the Robson Valley Forest District in each of the three survey years. Other studies reported detectability as low as 50% (Heard 1993). This correction factor yields a population estimate of 48 caribou. In either case, these estimates represent only a small proportion of 1900 mountain caribou believed to exist in British Columbia (Mountain Caribou Technical Advisory Committee 2002).

Over the three survey years, 60 adults and 12 calves were counted for an average of 20 calves per 100 adults, or 16.6% calves in the population. This level of calf survival is adequate to maintain a stable caribou population (Seip and Cichowski 1996). However, the percentage of calves was lower in each successive year, indicating that the population might be in decline.

Terry (1995) counted 22 caribou within the northern half of the Robson Valley, plus an additional 7 caribou in

the Walker Creek area in 1995. These counts did not include Foster Creek or the Camp Creek–Canoe River area. During our study, 24 caribou were counted in the northern half of the Robson Valley Forest District in 2001. Therefore, no evidence exists of a significant population change since 1995.

It appears that the Robson Valley is not a core area for mountain caribou in British Columbia, but rather provides peripheral habitat that is used in some winters by caribou herds centred outside the district boundary. All caribou observed during our surveys were within a few kilometres of the district boundary.

The caribou observed at Foster Creek represent the northern extent of the Central Rockies caribou population (Mountain Caribou Technical Advisory Committee 2002). The caribou observed in the Camp Creek–Canoe River watersheds represent the northern extent of the Wells Gray South population. Part of that population includes caribou that move back and forth between



tributaries of the North Thompson, and the Camp Creek and Canoe River watersheds. We observed caribou tracks moving between these watersheds during our surveys. The caribou in the upper Goat River watershed belong to the North Cariboo Mountains population, which contains about 350 caribou, primarily to the northwest in the Sugarbowl–Haggen Creek area.

In all three of these areas, we observed caribou in two of the three survey years, which indicates that their winter distribution and use of the Robson Valley varies from year to year. In total, it appears that about 50–60 caribou used the Robson Valley for winter habitat in at least one of the survey years.

Although we detected no caribou in the Mount Rider–East Twin Creek area or the Wallop Creek area over the three survey years, caribou were present in these areas within the past decade. For instance, Terry (1995) counted 9 caribou near Hellroaring Creek in 1995, and Apps and Kinley (2000a) reported on the movements of two radio-collared caribou that used the area in 1996–97. Caribou in Mount Rider–East Twin Creek area represent the southern extent of the Hart Ranges caribou population, which numbers close to 500 animals (Mountain Caribou Technical Advisory Committee 2002). In 2001 and 2002, we counted caribou in the Walker Creek area just north of the district boundary. Consequently, it is possible that some caribou from the Hart Ranges population have extended their range southward and use the Wallop Creek and Mount Rider–East Twin area in some years.

More woodland caribou use the Robson Valley in summer. For instance, some of the radio-collared caribou from the Sugarbowl–Haggen area moved south into the Goat and Milk river watersheds during the summer months (Terry 1995). Although we did not observe any caribou in the upper Rausch River watershed during the winter surveys, some radio-collared caribou that wintered in Wells Gray Park have used the upper Rausch in summer (Seip 1990).

Some northern ecotype caribou that winter in Alberta use the upper Morkill River and Forgetmenot Creek watersheds as summer range (Brown and Hobson 1998), but apparently had left the area by late November. We detected no evidence of caribou use in those watersheds during our winter surveys in 2000 or 2001.

Although mountain caribou use the rugged terrain of the Robson Valley for calving and summer habitat, in winter they avoid very steep terrain and instead select the more moderate slopes of rounded mountains or

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subalpine bowls (Seip 1990; Apps and Kinley 2000b; Terry *et al.* 2000). We observed caribou using this terrain in our March surveys. This type of terrain is also found in the watersheds along the Rocky Mountain Trench where, historically, caribou have been observed (e.g., Lucille and Belle mountains). However, caribou have disappeared from these watersheds in recent years and this may be associated with human disturbance and (or) increased predation. Many of these areas are heavily used by snowmobilers. As well, forest harvesting, land clearing, and settlement in the Trench have improved conditions for early seral ungulates, such as moose (*Alces alces*), elk (*Cervus elaphus*), and deer (*Odocoileus* spp.). Increases in these species may sustain increased predator numbers, which leads to increased predation on caribou (Seip 1992b).

Evaluation of Caribou Habitat Management Zones

At the time of the surveys, caribou habitat management zones had been delineated in nine areas: upper Goat River; West Twin Creek and Milk River; Snowshoe Creek; Mount Rider; Wallop Creek; upper Morkill River and Forgetmenot Creek; upper Castle Creek, upper Rausch River; and Foster Creek. The following recommendations are based on our evaluation of whether these existing habitat management zones are located in the appropriate areas to provide winter habitat, given the surveyed locations of caribou over the last three years.

1. Upper Goat River: This area was one of the three areas that saw repeated winter use by substantial numbers of caribou (see Table 1). Past telemetry and survey data also indicate regular use of this area. Maintaining the habitat management zones in this area is recommended. Much of the caribou habitat is currently managed as Caribou Medium, which allows partial cutting. Given the importance of this area to caribou, relative to other parts of the Robson Valley forest District, reclassification to Caribou High (no harvest) should be considered.



2. West Twin Creek–Milk River: Our surveys showed no evidence of caribou use in this area. However, recent telemetry and survey data indicate use, and it is immediately adjacent to the upper Goat River area where caribou were detected. Consequently, retention of the caribou habitat management zones in this area is recommended.
3. Snowshoe Creek: Our surveys showed no evidence of caribou use in this area, but the helicopter pilot reported recent sightings of caribou (T. Lemke, pers. comm., 2002). Given its proximity to abundant caribou populations to the northwest, continuing to manage it as caribou habitat is recommended.
4. Mount Rider: No caribou were observed in this area during our winter surveys, but caribou have used this locality within the past decade (Terry 1995; Apps and Kinley 2002a). Given its proximity to the abundant Hart Ranges caribou populations to the north, continuing to manage this area as caribou habitat is recommended for now, at least until a longer record of no further use is available.
5. Wallop Creek: This habitat management zone is located along the district boundary between the lower Morkill River and Walker Creek. No caribou were observed in this area during the winter surveys, but it is just over the height of land from the Walker Creek area where caribou were observed. Continued management of this area as caribou habitat is recommended.
6. Upper Morkill River and Forgetmenot Creek: This area does not appear to provide winter habitat for caribou, but it is used as summer range for caribou that winter in Alberta. The area should be managed as caribou summer habitat.
7. Upper Castle Creek: No caribou were observed in this area during the surveys. The terrain is very rugged and appears of limited value as winter habitat. Management as caribou summer habitat is recommended.
8. Upper Rausch River: No caribou were observed in this area during the winter surveys. The terrain appears too rugged for winter use, but some caribou may use it in summer. Therefore, management as caribou summer habitat is recommended.
9. Foster Creek: This area had repeated use by a small number of caribou. Continued management as caribou habitat is recommended.

The Camp Creek–Canoe River area was not previously delineated as a caribou habitat management

zone, but our surveys showed repeated use by significant numbers of caribou (see Table 1). The area also borders additional caribou habitat in the North Thompson region. Appropriate habitats within this area should be delineated and managed as caribou winter range.

In late winter, mountain caribou are primarily located at upper elevations in the Engelmann Spruce–Subalpine Fir biogeoclimatic zone, but in early winter they generally use lower elevations in this zone (Seip 1990; Terry *et al.* 2000). Consequently, to adequately protect winter habitat, management zones should include not only the areas where caribou were located during March surveys, but should extend down to include lower-elevation ESSF forest in the same areas.

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