

Ecological Relationships Between Threatened Caribou Herds and Their Habitat in the
Central Rocky Mountains Ecoregion

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2001-02 Report

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Abstract:

The purpose of this project was to determine the distribution and abundance of threatened caribou (*Rangifer tarandus caribou*) populations within the Central Rocky Mountains Ecoregion. We conducted late winter population surveys and counted a total of 687 caribou in this area. Using correction factors and/or other information to account for missed animals, we arrive at a total population estimate of 1050 caribou. The overall calf recruitment was 17% calves which indicates a stable population.

Caribou were distributed throughout most of the ecoregion, but were largely absent from the steep terrain along the central divide. Caribou on the west side of the ecoregion were located primarily in subalpine ESSF forests where they were feeding on arboreal lichens. Caribou on the east side of the ecoregion were located primarily in windswept alpine areas where they were feeding on terrestrial lichens.

This information improves our understanding of the current status of threatened caribou populations within this area, and provides good background information for the start of a radio-telemetry project in 2002-03.

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Introduction:

Woodland caribou (*Rangifer tarandus caribou*) in the “Southern Mountain National Ecological area” of Canada were listed as “Threatened” by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in the year 2000. This area includes all of the caribou herds living in the southern two-thirds of B.C. As a signatory to the National Accord for the Protection of Species at Risk, B.C. has an obligation to develop a recovery plan that addresses the current threats to the species and its habitat.

The caribou living in this area include both the “mountain ecotype” and the “northern ecotype” of woodland caribou. The mountain ecotype lives in the mountains of south-eastern B.C. Deep winter snow depths in this area limit opportunities for feeding on ground vegetation so the caribou feed primarily on arboreal lichens in old and mature subalpine forests during winter. The northern ecotype lives in the northern and western parts of the province. Caribou select areas with low snow depths in winter, either windswept alpine areas or low elevation pine forests. The low snow depths in these areas allow the caribou to crater through the snow to feed on terrestrial lichens.

The Central Rocky Mountains Ecoregion occurs at the transition zone between the northern and mountain ecotype. Several different caribou herds have been described within this area, but most have received very limited study. The current status of all but one of these herds is listed as unknown. It is important to understand the habitat requirements and feeding ecology of these caribou to ensure that forest management activities are compatible with maintaining caribou habitat.

The original objective of this project was to conduct a 5 year radio-telemetry study of caribou within the Central Rocky Mountains Ecoregion to determine movements, habitat use and populations status. When the funding for the project was limited to one year, radio-telemetry was no longer feasible so the project was changed to using aerial surveys of the area to determine caribou abundance, distribution, calf recruitment, habitat use and feeding activities within the area during winter.

Methods:

Caribou were surveyed from a helicopter during the winter of 2001-02. Most surveys were conducted between mid-February and late March of 2002, except for one survey of the Kennedy siding herd on their low elevation range in December.

Most of the potential habitat within the ecoregion, south of Peace Arm, was surveyed. The survey method involved flying along treeline in each watershed looking for tracks or caribou. When tracks were located we attempted to follow them until we located the caribou. Caribou were classified as calves or adults. Habitat type was recorded and coordinates of tracks and caribou were recorded using the helicopter GPS.

Results:

Moberly block:

This survey area included the area north of Highway 97 through the Pine Pass, up to the Peace arm, east of the continental divide, and west of Carbon Creek. The area included the west side of the Carbon Creek drainage and the watersheds draining into the Pine River and the upper Moberly River. Major mountains included Mt. Bickford, Mt. Frank Roy, Mt. Monteith, Beattie Peak, and the Monarch. Note that this survey area did not include Mt. McAllister east of Carbon Creek, or Mt. Stephenson and Mt. Le Hudette south of the Pine River, areas which were included in the census area reported in TERA 1997.

The survey was conducted on February 18 and 20. About 5 hours of survey time were spent searching for caribou. Strong winds made the survey conditions difficult.

A total of 18 caribou were located at 4 different locations, plus one additional set of tracks where we could not locate the caribou. Of the 5 locations where caribou or tracks were found, 3 were in alpine areas where the caribou appeared to be cratering for terrestrial lichens, and 2 were in subalpine parkland where the caribou appeared to be feeding on arboreal lichens.

<u>Location</u>	<u>Habitat</u>	<u>Calves</u>	<u>Adults</u>	<u>Total</u>
Big Boulder	Subalpine Parkland			tracks
Mt. Bickford	Subalpine Parkland	0	9	9
Monarch	Alpine	1	2	3
Mt. Wrigley	Alpine	0	2	2
Little Boulder	Alpine	<u>0</u>	<u>4</u>	<u>4</u>
TOTAL		1	17	18

This count provided a major underestimate of the caribou population between Highway 97 and Peace arm. Monthly surveys in winter by TERA environmental consultants from 1995 to 1997 found between 24 and 152 caribou in the area we surveyed and between 35 and 191 caribou in the area north of highway 97 including Mt. McAllistar (TERA 1997).

Given the major variability in counts, and the extensive recent survey data available in TERA 1997, we decided not to expend any additional time and money on this area but rather to concentrate on the area south of the highway.

Kennedy siding:

In December, caribou were concentrated at low elevations in the Kennedy siding area, between the Misinchinka River and the rail line. About one quarter of the extensive pine stand that the caribou traditionally used for early winter range was clearcut logged about 5 years ago.

We surveyed the area on December 4, 2001 and located 85 caribou, 40 in the pine forest and 45 in the clearcut.

We sampled feeding sites in both habitat types:

	<u>Clearcut</u>	<u>Forest</u>
Subzone	SBSwk2	SBSwk2
Elevation (m)	751	758
Snow depth (cm)	23	15
Feeding type	cratering for lichens	cratering for lichens
Ground cover	lichen, moss, bearberry, blueberry	lichen, moss, bearberry, blueberry

It appeared that the harvesting had not significantly altered the forest floor ground cover, and that the caribou were cratering for terrestrial lichens (*Cladina* spp.) in both the clearcut and the forest. Although snow depths were greater in the clearcut, they apparently were not deep enough to deter feeding.

We intend to revisit these sites in the summer for more detailed habitat evaluations.

We surveyed the Kennedy Siding area again on February 20 and 25, 2002 and saw no caribou. However, a large amount of recent caribou tracks and feeding craters were present in the forest. There was no evidence of recent caribou use within the clearcut. It appears that the caribou had just recently moved from low elevation range to high elevation range. Also, it appeared that prior to that movement, their feeding activity had been limited to the pine forest rather than the clearcut that they used earlier in the winter. Use of the forest was probably due to poorer cratering conditions within the clearcut, including deeper snow and more crusting.

On February 28, 2002, we surveyed the adjacent mountains that provide late winter habitat for the Kennedy siding caribou. The survey area was bounded by the Parsnip River to the west, the north side of Anzac River to the south, the continental divide to the east and the Missinchinka River to the north.

We saw 24 different groups of caribou with a total of 138 caribou, 24 calves and 114 adults (17.4 calves).

The conditions for this survey were ideal, with clear sunny weather immediately following a new snowfall. Under those conditions, we expect to see about 83% of the caribou, based on studies where sightability was determined for collared animals (Seip 1990, Young and Roorda 1999). Applying this sightability correction factor gives a population estimate of 166 caribou within this census area.

Caribou were present in all the watersheds including Fast, Colburne, Reynolds, Anzac, and Missinchinka. We also recorded tracks at 3 additional sites for a total of 27 locations. Habitat at those locations was:

<u>Habitat</u>	<u># groups</u>	<u>% groups</u>
Alpine	3	11
Parkland	12	44
ESSF forest	12	44

The majority of the feeding activity appeared to be on arboreal lichens in ESSF forest or parkland, but there was also some evidence of cratering in alpine areas.

Burnt River/Pine River Block:

This survey area included the Burnt River watershed as well as the Mt. Stephenson and Mt. Le Hudette area. It was bounded by the continental divide on the west, the edge of the mountains in the east, Highway 97 in the north and the Burnt River height of land in the south. Caribou in the Mt. Stephenson and Mt. Le Hudette area are sometimes included with the Moberly caribou north of the highway (TERA 1997), but it seems likely that the highway, railroad and Pine River pose a significant barrier to movement whereas there are no obvious barriers between that area and the Burnt River.

The area was surveyed on February 25. Conditions during this survey were poor with high winds. We were unable to properly survey the entire area, and were unable to locate caribou in areas where we found extensive tracks.

We located 8 caribou in the upper Burnt near the continental divide that were in parkland habitat and appeared to be feeding on arboreal lichens. We located extensive tracks in several areas further down the valley on windswept alpine ridges. We also saw 12 caribou on the windswept alpine ridges of Mt. Le Hudette. The total count for this area was 20 caribou, with 1 calf and 19 adults. This is a significant underestimate of the caribou in the area, given the failure to locate caribou in several areas with tracks, and the presence of up to 37 caribou in the Mt. Stephenson/Mt. Le Hudette area in recent years (TERA 1997).

Quintette:

This census area was bounded by the continental divide on the west, the Kinuseso River on the south, the edge of the mountains in the east, and the Sukunka River to the north. However, we did not extensively search the top end of the watersheds near the continental divide because generally the habitat appeared to be too steep and rugged for caribou. The area included Quintette mountain, the mountains between the Murray and Wolverine rivers, and the mountains between the Wolverine and the Sukunka. The survey was conducted on March 1.

We located 15 different groups of caribou for a total of 154 animals, including 31 calves and 123 adults (20% calves). We do not have any objective way to correct this total count for sightability, although it is highly likely that we did not see every caribou in the area and this number is an underestimate of the total population.

Of the 15 different locations, 14 were in the alpine and 1 was in subalpine parkland. It appeared that the vast majority of these caribou were feeding on terrestrial vegetation in the alpine.

Parsnip:

This census area included the watersheds draining into the Parsnip River from the east, south of the Anzac River (the boundary with the Kennedy siding census area). It included the south side of the Anzac, Table, Hominka, Missinka, and upper Parsnip. The surveys only extended about one-half to two-thirds up each watershed to the point where they became very steep and no longer provided suitable habitat. Within each watershed, there was an obvious point where the terrain started to rise steeply from valley bottom to alpine and lacked the subalpine bowls favoured by caribou in the lower sections of the watersheds.

The entire area was surveyed on March 20. In an area between the Table and Hominka river, we recorded extensive tracks but were unable to locate the caribou due to the lack of recent snow. We recounted this area on March 25 and located 19 caribou. We were concerned that we may have double counted some caribou so we cross referenced the GPS co-ordinates for the two dates. All of the caribou recorded on March 25 were in areas close to where we saw tracks on March 20, but were not close to any caribou that

we recorded on March 20. Therefore we concluded that these were caribou that we had not recorded previously and incorporated them into the count.

We recorded 12 different groups of caribou for a total of 82 caribou, including 70 adults and 12 calves (14.6% calves). Conditions for the survey were fairly good, although the lack of fresh snow made it difficult to locate caribou when tracks were located. However, we eventually found caribou at almost all the places where we saw tracks. Applying an 83% sightability correction provides a population estimate of 99 caribou, but this is probably a slight underestimate given the less than ideal conditions.

We located caribou or tracks at 23 different locations. Habitat at those locations was:

<u>Habitat</u>	<u># groups</u>	<u>% groups</u>
Parkland	6	26
ESSF forest	17	74

Feeding activity appeared to be restricted to arboreal lichen feeding, with no evidence of any cratering.

Hart Range Caribou:

The Hart Range Caribou herd were divided into 4 different census blocks, i) Walker Creek/Mt. Rider, ii) Torpy, iii) Herrick and iv) Otter Lake.

Walker Creek/Mt Rider:

This census block included the mountains between the Torpy River and the Morkill River which includes Walker Creek and POB Creek. This block was surveyed on March 8.

Two groups of caribou, for a total of 14, were located in or near Walker Creek. There were 11 adults and 3 calves. One group was in parkland habitat, the other was in ESSF forest.

No other caribou or tracks were seen in the remaining area.

Torpy:

This census block included Bearpaw Ridge, between the Fraser and the Torpy; the ridge between the upper and lower Torpy; and the mountains between the McGregor and the Torpy. This census block was surveyed on March 12.

A total of 24 groups of caribou were located for a total of 148 caribou. There were 120 adults and 28 calves (18.9% calves). Survey conditions were good but not perfect. Some local snowsqualls limited our search in some areas. The 83% sightability correction factor yields a population estimate of 178 caribou, but this is probably a slight underestimate.

For the 25 locations where caribou or tracks were recorded, the habitat was:

<u>Habitat</u>	<u># groups</u>	<u>% groups</u>
Parkland	8	32
ESSF forest	17	68

All caribou appeared to be feeding on arboreal lichens.

Otter Lake block:

This census block included the mountains between the MaGregor River and the Parsnip River, including James, Captain and Otter Creek. The majority of this area was censused on March 14, but the area between James Creek and the upper Parsnip was surveyed on March 20 as part of the Parsnip survey.

A total of 14 groups of caribou were located for a total of 90 caribou, consisting of 74 adults and 16 calves (17.8% calves). Survey conditions were poor since most of the survey was conducted in a snowstorm. Seip (1990) reported that sightability of radio-collared caribou in similar conditions was only 66%. Applying a 66% correction factor to the population count yields an estimate of 136 caribou, whereas the 83% correction factor yields an estimate of 108 caribou. The actual number of caribou was probably somewhere within this range.

For the 21 locations where caribou or tracks were found, the habitat was:

<u>Habitat</u>	<u># groups</u>	<u>% groups</u>
Parkland	4	19
ESSF forest	17	81

All caribou appeared to be feeding on arboreal lichens.

Herrick Block:

This area included the mountains between the McGregor River and the Herrick, as well as the front of the mountains north of Herrick Creek. It included the Logan, Gleason, Hedrick and McCullagh Creek drainages, as well as the front ends of the Framestead, Muller, Spakwaniko and Fontoniko drainages. The count was conducted on March 19.

Caribou were located at 7 different locations for a total of 23 caribou, consisting of 22 adults and 1 calf. Survey conditions were excellent so the 83% sightability correction factor was applied to give a population estimated of 28 caribou.

Habitat at the 9 locations where caribou or tracks were located was:

<u>Habitat</u>	<u># groups</u>	<u>% groups</u>
Alpine	1	11
Parkland	5	56
ESSF forest	3	33

Caribou appeared to be feeding on arboreal lichens. There was no evidence of cratering, even for the group travelling through the alpine.

Hart Range Total:

	<u>Calves</u>	<u>Adults</u>	<u>Total Count</u>	<u>Corrected Estimate</u>
Walker/Morkill block	3	11	14	17
Torpy block	28	120	148	178
Otter Lake block	16	74	90	108-136
Herrick block	1	22	23	28
TOTAL	48	227	275	331-359

The percent calves for the entire Hart range is 17.4%

Incompletely Surveyed Areas within the Central Rocky Mountains Ecoregion:

This project did not fully survey the entire Central Rocky Mountains Ecoregion due to lack of time and funds, but also because areas that were not surveyed were generally not likely to provide good caribou habitat.

There did not appear to be much suitable caribou habitat at the back ends of most of the watersheds along either side of the continental divide. Also, in the northeastern portion of the Ecoregion, south of Peace Arm, the ecoregion boundary extends out to include forested foothills all the way to Chetwynd. These hills do not provide windswept alpine and are unlikely to support caribou. Finally, we did not have sufficient funds to survey the area between highway 97 and Peace arm, west of the continental divide. This area is known to support a small number of caribou that appear to feed on arboreal lichens in subalpine forests (Hengeveld and Wood 1998; Backmeyer 1991).

The back ends of all the drainages along the continental divide are generally too steep and rugged to provide good caribou habitat in late winter. Although we partially surveyed many on these areas, there was little or no sign of caribou activity until we got further out the valleys to gentler terrain on the west, or large windswept ridges to the east.

We did partially survey the upper ends of the following watersheds along the continental divide:

Misinchinka River
Burnt River
Anzac River
Sukunka River
Murray River
Framstead Creek

but ,we found only one group of 8 caribou at the top end of the Burnt River.

Seip (1990) and Seip (2001) reported that caribou were largely absent from steep mountainous terrain in Wells Gray Park and the Robson Valley during late winter surveys.

Total Population Estimate for the Central Rocky Mountains Ecoregion:

	<u>Calves</u>	<u>Adults</u>	<u>Total Count</u>	<u>Corrected Estimate</u>
Moberly	1	17	18	191 ¹
Kennedy	24	114	138	166
Burnt/Pine	1	19	20	45 ²
Quintette	31	123	154	154+
Parsnip	12	70	82	99
Hart Range	48	227	275	345 ³
North Misinchinka	<u>-</u>	<u>-</u>	<u>-</u>	<u>50⁴</u>
TOTAL	117	570	687	1050

¹ Based on maximum total count in TERA (1997)

² Based on up to 37 caribou in Mt. Stephenson/Mt Le Hudette area (TERA 1997) plus additional 8 we saw in other areas.

³ Mid-point of the range of sightability estimates

⁴ Count of 39 (Hengeveld and Wood 1998) corrected for sightability

The percent calves for the entire area is 17.0%.

Late Winter Caribou Distribution within the Central Rocky Mountains Ecosection:

During late winter, caribou were concentrated on the western or eastern boundary of the ecosection, and largely absent from the steeper terrain along the continental divide (Figure 1). However, caribou are known to use that steeper terrain in summer.

Along the western side of the ecosection, caribou were found on rounded mountains and subalpine bowls in subalpine parkland or ESSF forested habitat. They appeared to be feeding exclusively on arboreal lichens. There was a continuous distribution of caribou along the western boundary from Kennedy siding, along the Parsnip, along the McGregor, the Torpy, and down to Walker Creek. Thus, the past practice of dividing this area into different herds is somewhat arbitrary.

Along the eastern side of the ecosection, caribou were found almost exclusively on windswept, alpine ridges where they were cratering for terrestrial forage. These caribou appeared to have a continuous distribution from the upper Moberly to the Pine, Burnt, Sukunka, Wolverine and Murray River.

Summary:

1. A total of 687 caribou were counted within the study area. The actual population estimate for the area is 1050 caribou when the counts are corrected for sightability, and previous censuses are used to fill in missing data.
2. The population estimates for the Hart and Quintette herds are comparable to previous estimates, but the new data indicates that the Kennedy siding herd is larger than previously thought, and the Parsnip herd represents an area where caribou were previously reported to only occur as “trace occurrences”.
3. The overall calf recruitment for the area is 17% calves which is indicative of a stable population (Bergerud 1992; Seip and Cichowski 1996). Calf counts for the individual herds for which there was adequate data ranged from 14.6-20% which also suggests that the individual herds were stable.
4. Caribou were largely absent from the central divide of the ecosection and were concentrated on both the western and eastern side. Caribou on the western side were found almost exclusively in subalpine parkland or subalpine ESSF forests in late winter where they appeared to be feeding on arboreal lichens. Caribou on the eastern side of the ecosection were found almost exclusively on windswept alpine ridges where they were cratering for terrestrial forage.
5. Most of the caribou at Kennedy siding used low elevation early winter range from November to mid-February. These caribou cratered for terrestrial lichens in a clearcut

and a young pine forest in December, but were restricted to the pine forest by February.

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Figure 1. Winter distribution of caribou detected in the Central Rocky Mountains Ecosession, winter 2001-02.

