

# Range Use and Fall Composition of the Liard Plateau Caribou Herd in Yukon and northern British Columbia

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## **Abstract**

The Liard Plateau caribou herd occupies an isolated alpine area in northeastern British Columbia, south and west of the Beaver River in the border region of BC and Yukon. This alpine block is known as the 'Caribou Range' on NTS mapsheets. This small herd was monitored for range use from 2002 to 2004 following the placement of 3 satellite collars placed on mature female herd members. Spatial data suggest that most of the range lies in northeastern British Columbia, with some use of the Larsen Lake area in the Yukon. A composition survey in 2005 revealed a low calf/cow ratio (19.6/100), and a low bull/cow ratio (26/100), with no large bulls present. Spatial information suggests range use doesn't extend far beyond the Caribou Range alpine block and does not include alpine ranges further north and east (ie Beavercrow ridge). Low total numbers observed and current composition suggest that further monitoring of this herd and review of current harvest practises are required by both agencies involved in this herd's management (Yukon Department of Environment, British Columbia Ministry of Environment).

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## **Background**

The Liard Region in Yukon makes up the Southeast corner of the territory which coincides with the Kaska First Nations Traditional Territory. Eleven caribou herds inhabit this region, some of which are transboundary with British Columbia and the Northwest Territories. The border region of Yukon, British Columbia and Northwest Territories is generally sparsely populated by caribou. Only two herds are found in the southeast corner of Yukon; the Lower Nahanni herd, occupying scattered alpine blocks generally 50 km or further north of the Yukon/British Columbia border, and the Liard Plateau herd that spend most of their time in British Columbia, with part of their range in the Larsen Lake area of Yukon.

Prior to 2002, Yukon Department of Environment (YDOE) surveys for caribou presence and composition had not been conducted in the Larsen Lake or Beaver River regions. Reports of caribou close to the Yukon/ British Columbia border did not seem to coincide with what was then called the Labiche and Coal River herds (personal communication, R. Florkiewicz, former Liard Regional Biologist, YDOE). Trappers in the Larsen Lake and Beaver River areas first reported caribou in the region in 1985 and 1992, respectively, commenting on caribou tracks, individuals and small groups of animals being seen in winter on their traplines.

Jean Legare, local trapper based at Larsen Lake, identified areas in his trapping concession where caribou had been found. These include: Larsen Lake (1 cow in the lake, summer 2006, a mature bull alone on lake in winter 2004), several areas with caribou tracks north of Crow River, one area to the west of Crow River (all in Yukon), north of Larsen Lake and at the headwaters of Larsen Creek. Not many tracks have been noted west of Larsen Lake. Caribou sightings typically take place in early October through the winter period, which corresponds to the trapper's active period.

Ralph and Lawrence Lee indicate seeing caribou tracks in the Beaver River watershed as long ago as 1985, southwest of Fantasque Lake as well as in the upper Beaver watershed near Gold Pay creek and Pool Creek. These last two areas are more likely linked to the Lower Nahanni caribou herd that winter in the South Nahanni River watershed.

In a traditional knowledge study focussing on caribou (Sun-Comeau, 2001), the Liard Plateau herd was not discussed. Traditional knowledge may be available for this herd, but it has not been collected or accessed by YDOE. Reports of periodic caribou presence prompted YDOE biologists to examine the area by helicopter and capture a small number of caribou to place satellite transmitter collars in this herd.

The Liard Plateau caribou herd occurs in the vicinity of Larsen Lake (60° 06'N, 125° 35'W coordinates) and to the south in the alpine block above the Crow River (locally known as the Caribou Range (59° 57'N 125° 04'W)) in northern British Columbia. Yukon biologists had not conducted surveys on this herd previous to 2005. Prior contact with the herd took place in February 2002 when satellite transmitters were placed on three adult female caribou. Data was collected for 2.5 years between deployment and drop-offs of these collars. A fall composition survey flight was then flown in September of 2005. The information collected with these activities is contained within this report.

Original funding for this collaring work came from the Yukon Protected Areas Strategy, YDOE due to the interest around the Beaver River as a potential protected area due to the high conservation values for forest birds that have been reported (personal communication with C. Eckert, Conservation Biologist, YDOE). Composition survey funding was received from YDOE Regional Management program funds.

## **Study Area**

The study area lies in Southeast Yukon and Northeast British Columbia, encompassing ca. 2 000 km<sup>2</sup>. This area belongs to the Hyland Highlands ecoregion and is typified by rolling terrain, with warm summers and cold winters. Elevations in this ecoregion generally range between 300 and 750 meters, with few alpine areas. However, the Caribou Range study area exceeded normal elevations for the region and is a gently

sloping raised alpine plateau dominated by low shrubs, grasses and few small, scattered copse of alpine fir. The surrounding boreal forest in lower elevation areas is dominated by white and black spruce overstory and rose, alder, dogwood and horsetail understory (Yukon Wild, 2002). Low lying areas typically contain willow, labrador tea, crowberry and sphagnum moss. Larsen Lake and Crow creek lie north of the Caribou range alpine area, while the Beaver River lies north and east.

## **Methods**

Investigations into this herd took place in two stages. Caribou were located and captured via heli-net gun for collar placement. Following the pre-programmed collar drop off period, a fall composition survey was flown to sample the herd's population structure.

### *Satellite Transmitters*

A Yukon capture team placed 3 collars on adult females in this herd during February 2002. Satellite transmitter collars (Telonics Inc, Meza, Arizona) were placed using a heli-net gunning technique. Collars were deployed February 21, 2002 in Caribou Range alpine area. Each collar was programmed to activate and transmit every 5<sup>th</sup> day, sending location information to the CLS America: Argos satellite system. Monthly downloads of the data were handled by Environment Yukon staff. Drop-off mechanisms were installed and programmed to activate in late 2004.

### *Spatial Analysis*

Spatial analyses of the satellite collar data was assessed in ArcView 3.2 (Environmental Systems Research Institute Inc.) using the Animal Movement extension. Kernel estimation was conducted using 95% and 50% of the range utilizing the entire sample for each animal's set of locations. Biologically seasons were described as calving (May), post calving (June through August), rut (mid-September to mid-October), early winter (mid-October through December), mid winter (January & February), and late winter (March and April) (Kuzyk & Farnell, 1997).

### *Fall Composition Survey*

Methods used to conduct the fall composition survey followed standard protocols used in Yukon. Suspected rutting habitat within the Caribou Range plateau area were searched

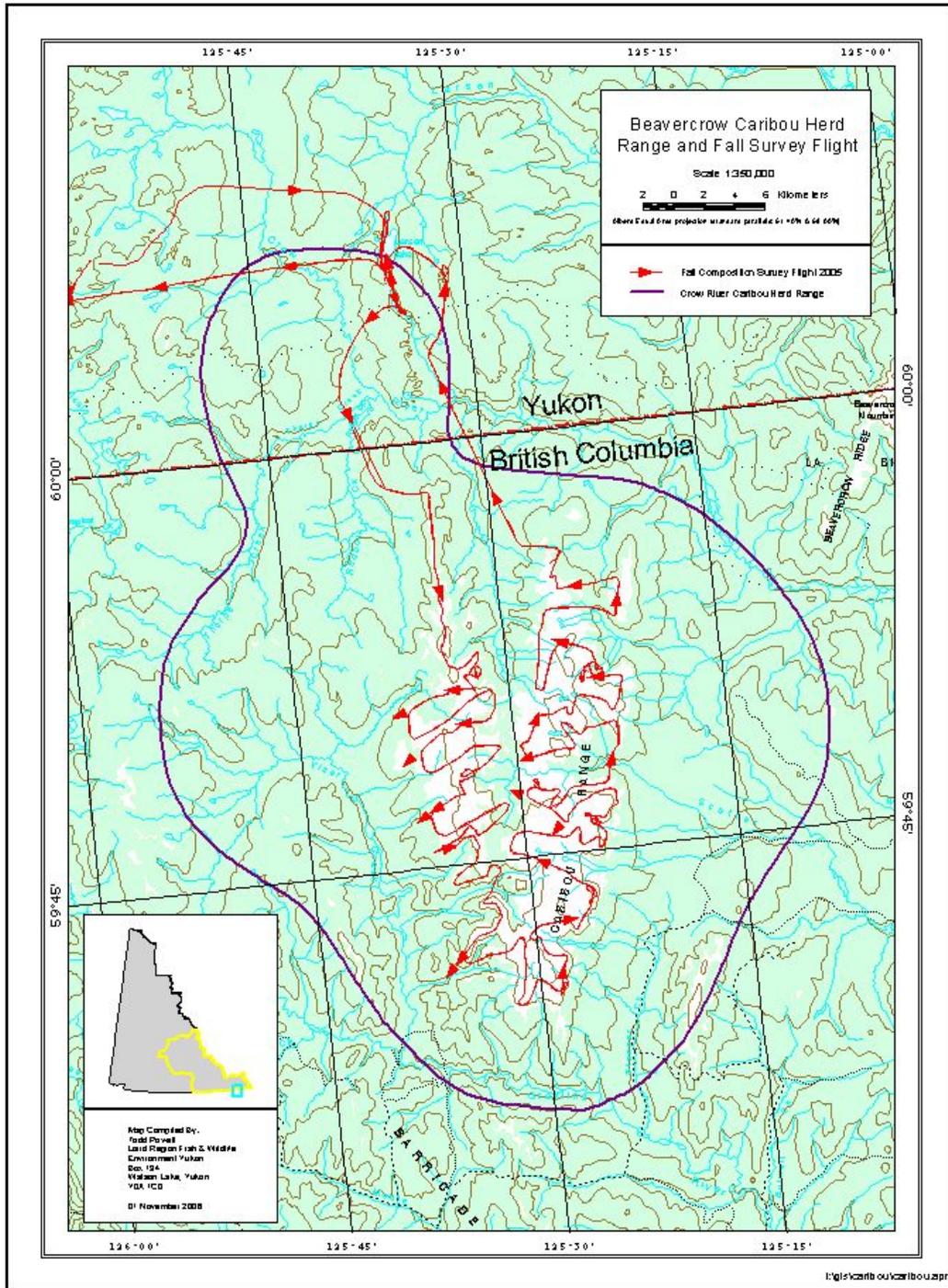
by helicopter (Bell 206 Jet Ranger) about 200 meters above ground level at approximately 120 kph. During the fall survey in 2005, Rick Farnell (Caribou biologist, YDOE) classified caribou from the front seat, while Jan Adamczewski (Liard Regional Biologist, YDOE) filmed with video camera from the back, and Todd Powell (Wildlife Technician, YDOE) recorded. Each group of caribou were recorded by GPS and later downloaded to a GIS. Each group was approached by the helicopter and assessed for numbers of mature bulls, immature bulls, cows and calves. No attempt was made to classify calves by sex.

The search was confined to alpine areas, where the helicopter conducted a search pattern that swept each side of the ridges and plateaus (see Map 1). A total of 2.3 hours were needed to conduct the survey, with an additional 3 hours needed to reach the study area and then return to Watson Lake, Yukon.

## **Results**

All the caribou classified were on the Caribou Range alpine area (see Map 1), south of 60° N. Groups ranged from 1 to 56 (mean 12.8). The only large group encountered numbered 56. One immature bull represented the smallest group. 141 caribou were classified (97 cows, 19 calves, 18 immature bulls and 7 mature bulls) giving a calf:cow ratio of 19.6/100 and a bull:cow ratio of 26/100. Few mature bulls were present in observed groups. Map #1 shows flightlines and group #'s of observed caribou. Light conditions were generally good to excellent. Cloud cover in low valleys was dense to the northeast, but below tree line, leaving good visibility on the plateaus. Other wildlife observed included 1 grizzly, 2 wolves, and several moose. Upon initial deployment of satellite collars in 2002, the capture crew found less than 200 caribou in the areas searched (Jan Adamczewski, personal communication) The survey crew commented that the sampled population likely represented the majority of the herd. This assumption was further bolstered in that rutting locations for the 3 study animals coincided with the alpine area searched. Mark-resight estimates were not available as the 3 collars were suspected to have properly activated and dropped off their host animal the previous year.

# Map 1



### *Collared caribou*

Animal #25 began transmitting on April 1, 2002 and gave the last reliable transmission Sept 22, 2004 (170 usable locations). Animal #26 began transmitting April 1 2002, with the last reliable transmission occurring on Oct 12, 2004 (154 usable locations). Animal #27 began transmitting April 1, 2002, until the last reliable location was collected on Nov 16, 2004 (183 usable locations). Data was collected until Dec 12, 2006, but all 3 collars showed remaining transmissions within ~ 300m proximity of the last, suggesting no animal movement or more likely that the pre-programmed drop-offs had activated effectively and collars became detached from their host animal.

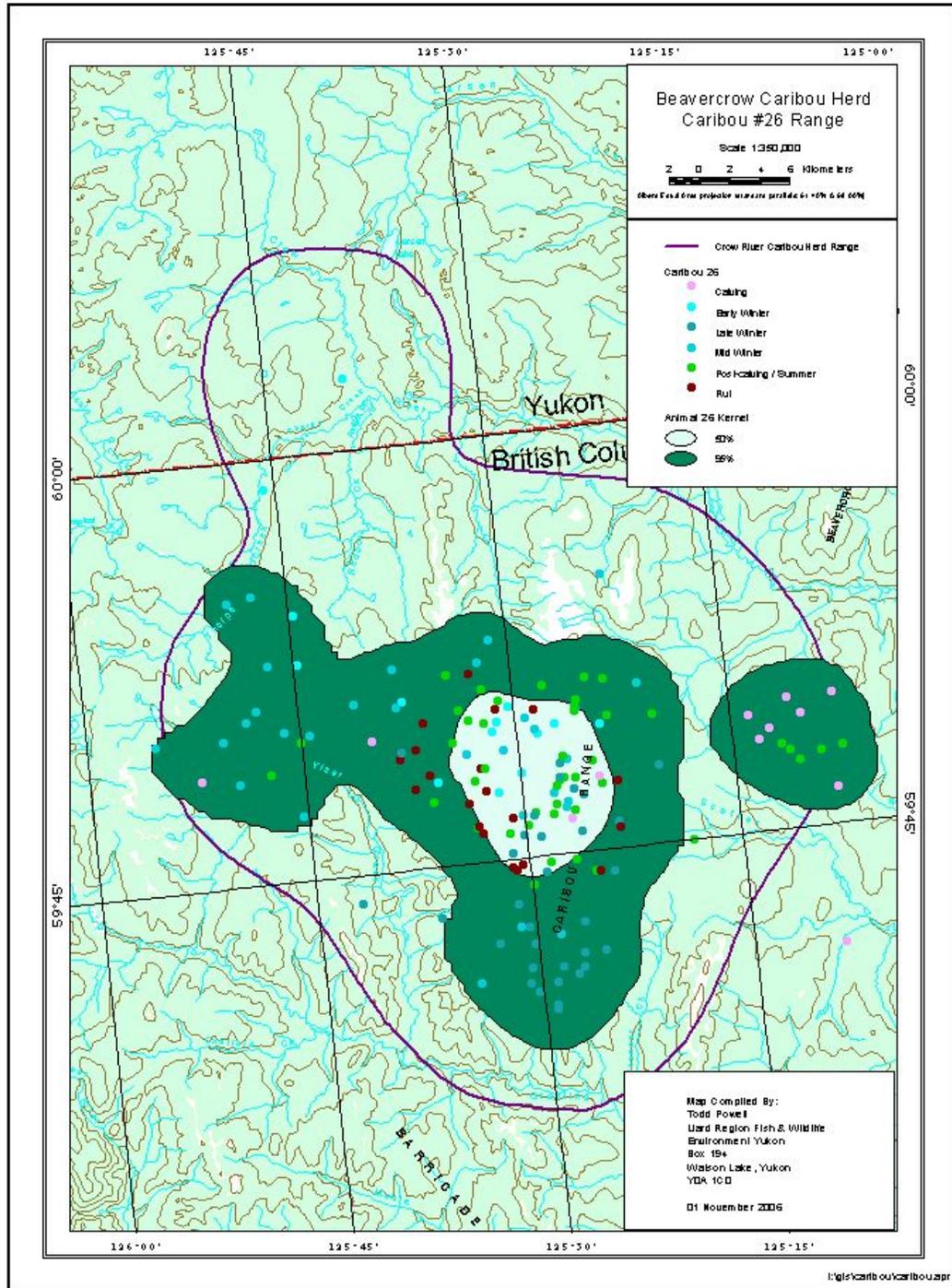
Animal #25 demonstrated the largest home range of the 3 studied female caribou (see map 2). The 95% kernel range was 1196.4 km<sup>2</sup>, with the 50% kernel at 296.4km<sup>2</sup>. Calving occurred in Yukon below treeline in each of the 3 years monitored. The rest of the time was spent mostly on the Caribou Range alpine area or adjacent forested areas.

Animal #26 had a home range about half the size of #25 (see Map 3). This female caribou ranged over a 95% kernel area of 670.6 km<sup>2</sup> over 2.5 years, with a 50% kernel of 95.1km<sup>2</sup>. All seasons were spent in the same general area of the central plateau, with some movement into the forested area during winter and post calving periods. Calving occurred to the east of the Beavercrow ridge during the 3 years of study.

Animal 27: stayed very close to one area of the plateau (see Map 4) and showed a 95% kernel area of 48.2 km<sup>2</sup> over a period of 2.5 years. All seasons were spent in the same general area with few forays into the forested lower regions around the plateau. Rutting, wintering and calving/post calving all occurred in the same general area, with calving in 2002 taking place to the west of the ridge in treed areas.



Map 3





## **Management Implications**

The Caribou Range plateau forms the core habitat of the Liard Plateau caribou herd. The Larsen Lake area forms the calving area for at least one individual cow caribou, but is likely utilized less than forested areas immediately adjacent to the alpine block. Key rutting areas are likely limited to the Caribou Range alpine block, with little, if any rutting activity taking place on the nearby Beavercrow ridge. Informal assessments of the relatively small alpine areas north and east of this area have not yet revealed use by caribou, suggesting that the Liard Plateau herd doesn't extend beyond the currently defined range boundary (see Map #1).

The number of animals observed in 2002 and 2005, coupled with the herd range described by available spatial information, suggests the herd population is likely less than 200 individuals. Further assessment of the herd population and range is required.

This small herd's sustainability may be affected by the low bull to cow ratio coupled with a lack of large breeding bulls. The 2005 composition survey found no large bulls. The male age structure found in rutting groups was skewed to younger, smaller animals. A minimum of 30 bulls per 100 cow caribou is needed to ensure full pregnancy rates (Yukon Caribou Management Guidelines, 1996). An equal number of calves per 100 cows is required to ensure population stability. Neither of these key numbers were found in 2005. Recruitment is affected by many factors (ex: weather, predation, pregnancy rates, birth weights). A low recruitment from one survey cannot lead to speculation on pregnancy rates. However, given small herd size and an apparently skewed bull/cow ratio, further investigation of the herd composition is warranted.

A herd of this size, if occurring totally within Yukon, would be considered for complete hunting closure. Hunting practises have the ability to affect a confined, small herd such as this, and needs to be reviewed considering the current information. As this herd's range occupies two different management jurisdictions, it is recommended that Yukon and British Columbia confer and collaborate to develop a management plan, and if required a recovery plan to ensure the herd's sustainability.

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