

**Movements and distribution of the Bathurst and Ahiak
barren-ground caribou herds**

2005 Annual Report

Submitted to

West Kitikmeot Slave Study Society

Submitted By

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Summary:

Objectives for 2005 included deploying 10 collars on cows from the Bathurst caribou herd and 10 collars on cows from the Ahiak caribou herd. A reconnaissance survey over the winter range of the Bathurst herd found heavy concentrations of caribou at Lac Grandin southeast to Rae Lakes and then low densities of caribou until east of Yellowknife. Of the 10 collars put on the Bathurst range, three died between April and June and the remaining seven calved on the Bathurst calving ground.

Flights over the Ahiak winter range resulted in no caribou seen east of Contwoyto, low concentrations on the Back River and high concentrations east of Artillery Lake and in the Nonacho Lake area. Five collars were deployed east of Artillery Lake and five in the Nonacho Lake area. Of the five collars deployed in the Nonacho Lake area, two caribou migrated to the Bathurst calving ground. The remaining eight collars calved on the Ahiak calving ground.

In 2005, in addition to addressing the objectives of the movement and distribution study for individual herds we successfully collared 12 cows from the Bathurst herd and 8 from the Ahiak herd. We also documented overlap in the winter distribution of Ahiak and Bathurst caribou at Nonacho Lake.

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Objectives

- 1) To measure weekly movements of caribou cows on their seasonal ranges and daily movements on post calving ranges.
- 2) To measure the probability of caribou encountering mine and potential mine sites.
- 3) To determine the geographic scale of the zone of influence for caribou and its relationship to the size of the mine's footprint and duration of operation.
- 4) To assist communities with developing their use of the caribou movements data.

Study Area

The Bathurst and Ahiak herds' seasonal ranges overlap the Slave Geological Province (Figure 1).

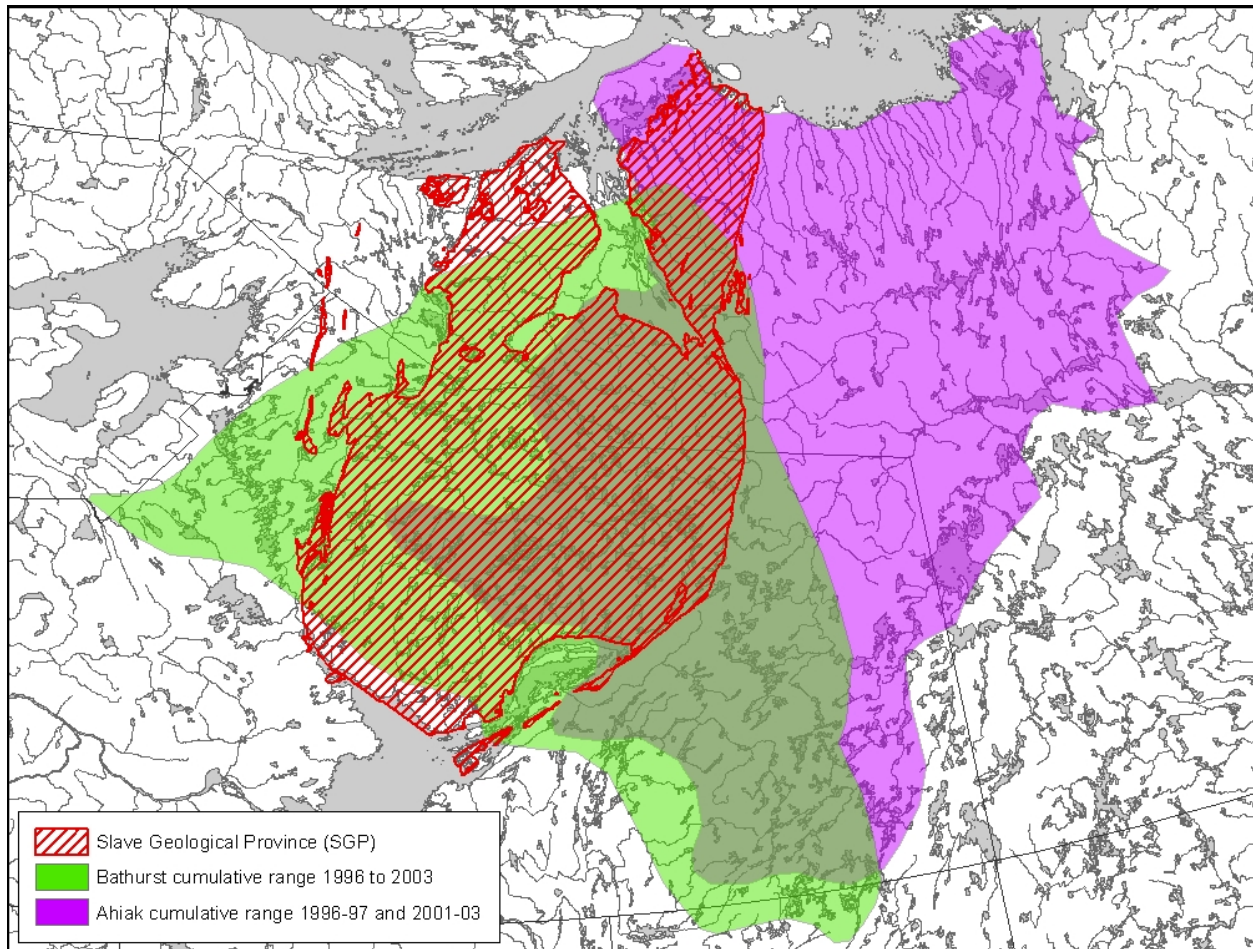


Figure 1. Bathurst and Ahiak barren-ground caribou herds cumulative use ranges from satellite collars in relation to Slave Geological Province.

Project design

- 1) We had previously captured 10 cows from the Bathurst herd in October 2004. We used the locations of those cows in March 2005 to assist in collaring another 10 cows in the Bathurst herd and 10 cows from the Ahiak herd. We need to collar at several locations to ensure that the collars are spread through the herd. The cows are fitted with collars carrying satellite transmitters.
- 2) The movements of collared cows are monitored by satellite and each transmitter is programmed to transmit daily during post-calving and then at five-day intervals for the

remainder of the year.

3) The collars have a 48-month battery life and are fitted with automatic pre-programmed drop-offs.

4) Statistical analyses will be similar to those previously used to analyse the movements of caribou relative to the mine sites (Boulanger et al. 2004). Essentially we will use the movements data with the individual caribou as the sample unit and develop models to examine the caribou movements relative to a number of zones around the mine sites. We will use vegetation data from the WKSS remote sensing study to define caribou habitat for Ekati and Diavik and the Snap Lake vegetation study data. To index seasonality in vegetation we used the Normalized Difference Vegetation Index (NDVI) because caribou mainly select for areas of comparatively high greenness (and forage) value. We will use Resource Selection Functions to assess habitat selection of caribou and the effects of mine sites on caribou distribution.

5) We will provide GIS advice to and work with communities who wish to use the movements database (community capacity-building).

Activities for 2005

The 2005 activities were to firstly collar the caribou and verify their herd identity from their calving distribution. Secondly, we tracked caribou seasonal movements from their locations but analyses of the location data will not be practical until we have data from several years.

To map caribou distribution in March 2005, we used a fixed-wing aircraft flying systematically placed transects to cover as large an area as possible. Once caribou

distribution was mapped, we used a Hughes 500D helicopter, a hand held net-gun and a handler to capture and collar the caribou cows. For the capture and handling, we followed the Standard Operating Protocol from the Animal Care Committee (Environment and Natural Resources). We designated the herd identity for each collared cow based on her location in mid-June 2005 calving ground location.

Results

Collaring March 2005: We flew transects spaced at approximately 25 km intervals during a reconnaissance survey 16-25 March 2005 (10 878 km) in a Helio-Courier aircraft (Figure 2). The Department of Environment and Natural Resources (Sahtu Region) covered the area west of Lac La Martre (Richard Popko pers. comm. 2005). They reported large numbers of caribou near Lac Grandin which was also the location of a collared Bathurst herd cow 06 (collared October 2004). We extended the reconnaissance flight to Lac Grandin (Figure 2) to gauge the relative caribou densities.

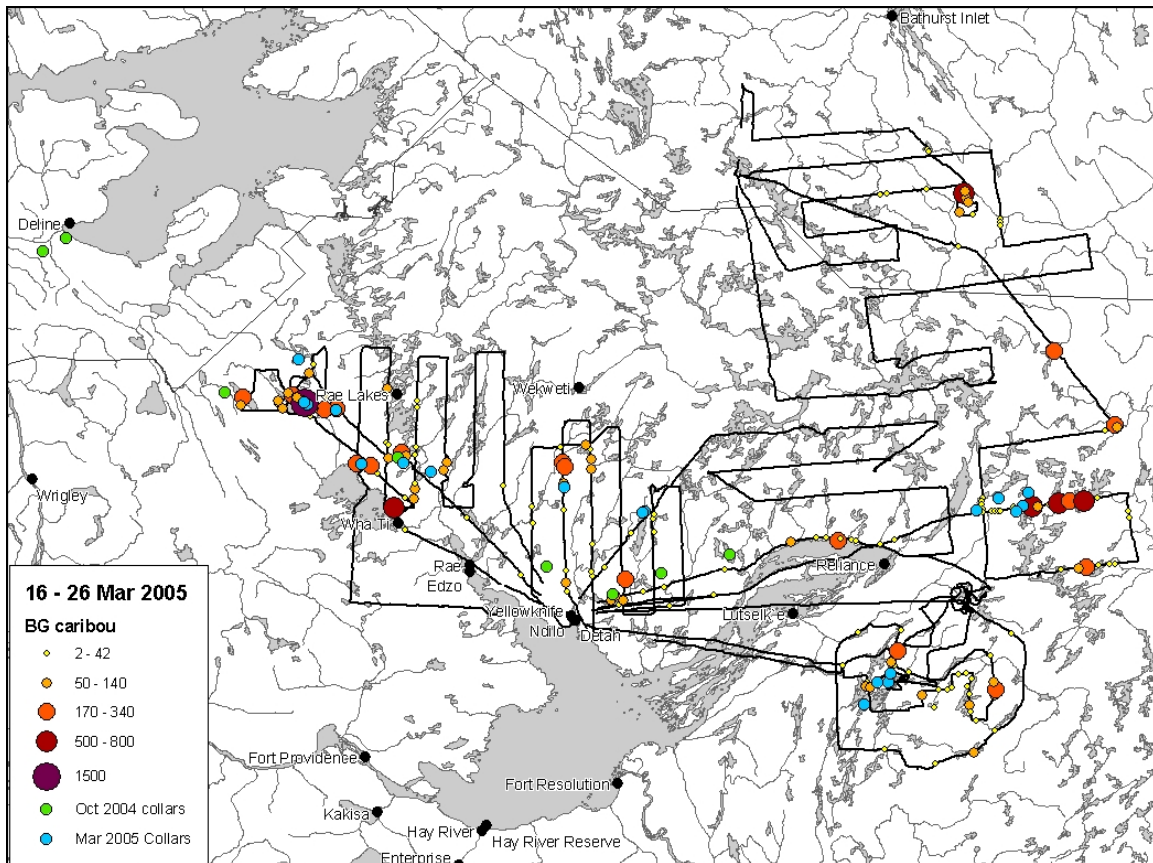


Figure 2. Flightlines, caribou observations, location 2004 satellite collars and collaring locations during March 2005, NWT.

The caribou were distributed from Lac Grandin (the heaviest concentrations of caribou, trails and feeding craters), east to south of Rae Lakes and then relatively low densities until east of Yellowknife. East of Yellowknife we found low thousands of caribou extending north to south of Gordon and Duncan Lakes. There were smaller concentrations of caribou at the north end of Gordon Lake and toward Upper Carp Lake. Along the north shore of McLeod Bay, groups of caribou were filing west and trails indicated that they had moved from at least Kluzial Island. The island was heavily tracked and cratered.

We found caribou in association with all the October 2005 collars (Figure 2). We also found a few thousand caribou between the north end of Gordon Lake and Upper Carp Lake that did not have a satellite collared cow in the area.

We did not find caribou east of Contwoyto Lake, near Pellat Lake or Alymer Lake, which had been areas where collared caribou from the Ahiak herd had previously wintered. However we found a few 100 caribou on the Back River and then thousands of caribou east of Artillery Lake. We found a second concentration of caribou in the Nonacho Lake area and caribou trails and small groups of caribou moving northeast from Nonacho Lake connected the two areas.

The fixed-wing aircraft was also used as a spotter plane and carried extra fuel to support the capture and collaring (22-26 March). We added four satellite collars to the concentration of caribou in the Lac Grandin area and three collars to south of Rae Lakes. Three cows were collared between north Gordon and Upper Carp Lake. Of those 10 collars, three died (Collar 191 by 30 April; 198 by 20 May and 95 by 4 June). The remaining seven migrated to the Bathurst calving ground. The cow 198 was migrating northeast from the Lac Grandin area where she had been collared and we suspect that she was migrating with cows from the Bluenose East herd when she died.

We collared five cows in the area of Nonacho Lake and five cows immediately east of Artillery Lake. Based on the June 2005 distribution of the collared cows, we conclude that we had collared eight cows from the Ahiak herd. Two of the five cows collared at Nonacho Lake migrated to the Bathurst herd's calving grounds west of Bathurst Inlet. By late April 2005, one (85) of the cows collared at Nonacho Lake had joined up with the cows collared east of Artillery Lake, which were moving northeast.

One other cow (88) had crossed the East Arm of Great Slave Lake and by 1 June 2005, she was the first collared cow to reach the Hood River (calving ground). The nine other cows collared at Nonacho Lake and Artillery Lake were all east of Bathurst Inlet by 6 June 2005 and were scattered between Bathurst Inlet and east to the Back River. Then one cow (86 collared at Nonacho Lake) turned west and crossed Bathurst Inlet to the Hood River by 11 June.

Discussions/Conclusions

The use of the locations from the satellite-collared caribou cows of the Bathurst herd for monitoring at the diamond mines is increasing. We are also realizing that measuring caribou responses to the diamond mines depends on the number of collared caribou (Boulanger *et al.* 2004). The objective of collaring cows in March 2003, October 2004 and March 2005 is to maintain a sample size of 10 – 20 satellite-collared cows in the Bathurst herd. An additional objective in 2005 was to have 10 satellite-collared cows in the Ahiak herd.

We successfully collared 12 cows from the Bathurst herd and 8 from the Ahiak herd. We documented overlap in the winter distribution of the Ahiak and Bathurst herds in the vicinity of Nonacho Lake (south of Lutsel K'e).

Links with Parallel Studies

Satellite-tracking of caribou in the Bathurst herd only started in 1996 and for Ahiak herd in 2000 (Gunn *et al.* 2001, Gunn and D'Hont 2003). For the longer-term view of caribou movements, we have to turn to the people who have spent decades and

centuries with the caribou. Our results on the movements will be integrated and compared with the long-term information in the project's final year.

Training Activities and Results

Opportunities for training were not feasible as the 2005 annual activities were the caribou capture, downloading data and providing maps.

References

- Boulanger, J., K. Poole, B. Fournier, J. Wierzchowski, T. Gaines and A. Gunn. 2004. Assessment of Bathurst caribou movements and distribution in the Slave Geological Province. Government of the Northwest Territories Department of Resources, Wildlife and Economic Development Manuscript Report No. 158. 113 pp.
- Gunn, A, and A. D'Hont. 2002. Extent of calving for the Bathurst and Ahiak Caribou herds June 2002. Government of the Northwest Territories Department of Resources, Wildlife and Economic Development. Manuscript Report No. 149. 35pp.
- Gunn, A., J. Dragon and J. Boulanger. 2001. Seasonal movements of satellite-collared caribou from the Bathurst herd. Final report to the West Kitikmeot Slave Study Society, Yellowknife, NWT. 80pp.