

*Ebbutt Hills Boreal Caribou
Study Progress Report
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Background

In response to the new federal Species at Risk Act (SARA) and following extensive consultations with the Liidlii Kue First Nations (LKFN) and Fort Simpson Métis Local (FSML) membership of Fort Simpson, the Department of Environment and Natural Resources, Dehcho Region, initiated an ecological study of boreal caribou in the Fort Simpson area during spring 2005 (Fig. 1). There was limited scientific knowledge about boreal caribou in the area and LKFN and FSML members saw the benefits of combining their own traditional knowledge of caribou in the area with the scientific information this study could provide. The study area included portions of the proposed Mackenzie Gas Pipeline route. The ecological study involved the deployment of satellite radio collars on female boreal caribou in order to document seasonal range use, seasonal movements, calving areas and calving time, fidelity of range use and seasonal movements over a 4-5 year period. Collared females would also be used to provide information on calf production, calf survival, and adult female survival. This study would be one of a number of ecological studies being conducted on boreal caribou in this and other regions of the Northwest Territories to increase our knowledge of boreal caribou so that in the face of increasing development pressures informed decisions regarding land use could be made.



Figure 1. The Ebbutt Hills study area outlined in red. Five satellite radio collars were deployed on female boreal caribou in the study area in March 2005.

Satellite Collar Descriptions and Deployment

The satellite collars were designed to provide as much information on caribou locations data as possible over a minimum 4-year period. We deployed ST-20 collars, manufactured by Telonics, on 5 adult female boreal caribou in 2005. Three collars were of the type with a release mechanism (Fig. 2 at right red arrow) to release off the animal after the 4-year study period. Two collars had previously been retrieved from caribou killed by predators in the Trout Lake study and did not have the release mechanism. All 5 collars were of the preferred teardrop design with both a satellite (Fig. 2 at left blue arrow) and a VHF (Fig. 2 at the top black arrow) transmitting beacon. All collars were programmed with the same duty cycle that provided satellite locations daily from 1 May to 14 June, the presumed calving period, and provided satellite locations once every 3 days for the remainder of the year. The 2 redeployed collars began transmissions immediately upon deployment whereas the 3 new collars started their transmissions on 1 April 2005.

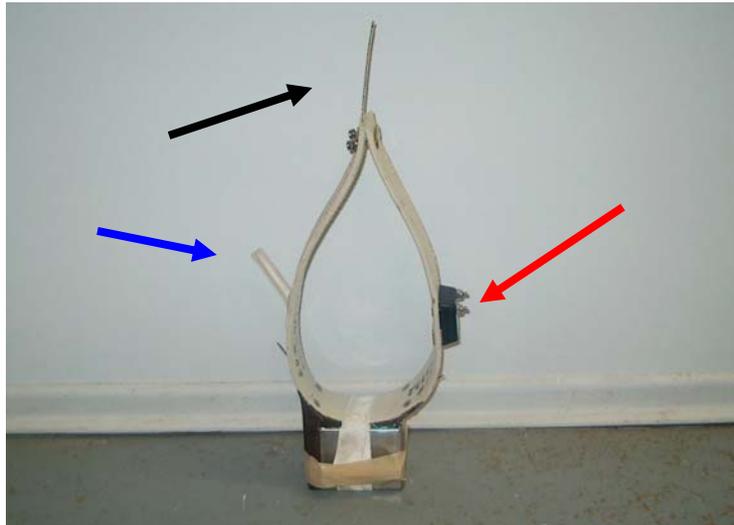


Figure 2. Telonics ST-20 satellite collar teardrop design with a release mechanism (right red arrow), a satellite beacon (left blue arrow) and a VHF beacon (top black arrow).

Caribou were captured by net-gunning them from a helicopter. ENR contracted a professional net-gunning crew to do the work. The crew had to follow strict animal care guidelines during the operation. Blood and fecal samples and an ear plug were collected from each captured animal as long as the opportunity presented itself. Handling times were kept to a minimum. Immediately prior to the deployment of the satellite collars we made a reconnaissance flight in a fixed-wing aircraft to locate animals that could potentially be collared and to direct the capture crew in as efficient a manner as possible. Snow conditions were ideal for the capture as the deeper snow restricted movements. The 5 caribou were collared in different parts of the study area on 4 March 2005 (Fig. 3).

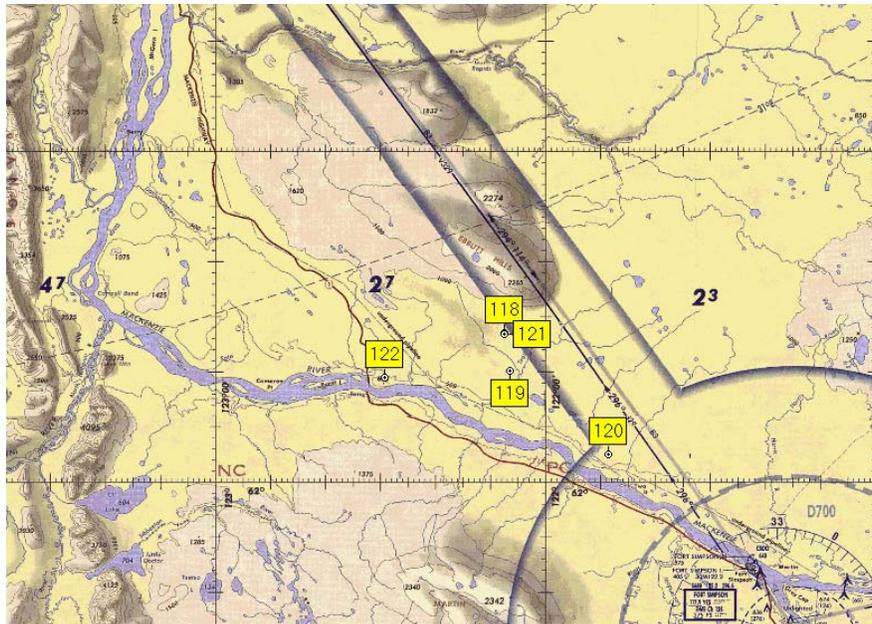


Figure 3. The locations of the 5 female boreal caribou collared 4 March 2005.

Aerial Relocation Flights

We planned on making a relocation flight shortly after the collars were deployed to check on the newly collared animals as well as planning for two annual relocation flights; one post-calving (late May-early June) and one in late-fall (late-September). These flights were scheduled so that we could determine how many female caribou had borne calves and whether the calves survived through the summer to the fall. Flight time over the animals is kept to a minimum. We photograph the groups to verify the presence of calves. Additional flights would be made if and when we had indication that collars were stationary for an extended period of time or we had an indication of collar malfunction. Relocation flights were made primarily with a Cessna 172 fixed-wing aircraft, sometimes a Bell 206B helicopter and were dependent upon aircraft availability and suitable weather conditions for flying. Retrieving downed collars generally required helicopter support.

- On 21 March we checked on the newly collared animals and located all of them in different groups.
- On 30 March we did an additional flight to check on a suspected downed collar. We located two fresh carcasses in one area and obvious signs of predation by a pack of wolves. Upon a ground investigation we determined one carcass was from a collared animal. We retrieved the collar and teeth from the site. The teeth were subsequently aged and this caribou was 10 years old at the time of her death.
- On 1 June we did a post-calving flight with fixed-wing aircraft but half of the animals were in heavy timber and we were unable to get visual observations.
- On 4 June we used a rotary aircraft and got a visual observation of a third collared caribou.

- On 6 September we boated to and hiked in on a suspected downed collar west of NDulee Crossing. We located and retrieved the collar and teeth from what strongly appeared to be another wolf kill site. We have not received the age of the teeth from the lab yet.
- On 23 September we did a late-fall flight but inclement weather prevented us from getting visuals on all but 1 caribou.
- On 20 October we attempted to get visuals on the 2 caribou missed on the previous flight but were unsuccessful.

Preliminary Findings

We discovered just how elusive boreal caribou were especially in the snow free seasons. The boreal caribou's natural colour scheme blended in well with the ground vegetation, even before leafout and after leafdrop caribou were extremely difficult to get positive observations from the aircraft. It was only during winter that we had a 100% success rate of observing all collared animals that we were searching for using the VHF telemetry equipment. We also discovered that the female boreal caribou collared in their wintering areas, calve and summer over a much larger range of the landscape. One collared caribou spent much of the rest of the year in the Fish Lake area, some 100km north of where she was collared (see Fig. 4). The Fish Lake area has been used by Bluenose-East barren-ground caribou during late winters in recent years (John Nagy pers. comm.; Richard Popko pers. comm.) The unexpectedly wide distribution of boreal caribou in this area adds to the challenge of getting visual observations of collared animals with an increased diversity of land cover types and localized weather conditions. Because we did not observe each collared female during the post-calving and late-fall flights, and we had two mortalities prior to the fall we have limited information on calf production and survival through the summer. None of the 3 remaining collared females appear to have had calves with them going into the winter.

There were 2 collared caribou mortalities during the first year of the study, one (10 years old) in late-March and the other in May-June (age still being determined). The collars were retrieved from both animals. There is strong evidence that both animals were preyed upon by wolves. Studies elsewhere (Trout Lake and Cameron Hills) have shown that most adult female caribou mortality is during the spring and early-summer (Larter and Allaire 2005; D. Johnson pers. comm.). The Ebbutt Hills area has an abundance of moose, as well as boreal caribou, which increases the overall prey base. This may result in increased predator numbers in the area.

As found in other studies, boreal caribou certainly do not have a common calving area and do not congregate during calving (Nagy et al 2005; Larter and Allaire 2005; D. Johnson pers. comm.) Collared females were more widely dispersed in and beyond the initial study area than anticipated (Fig. 4). During calving and summer, caribou were in small groups of 1 or 2 animals with or without calves and daily movements were relatively restricted, findings similar to those found in the Inuvik region and Trout Lake study (Nagy et al 2005; Larter and Allaire 2005).

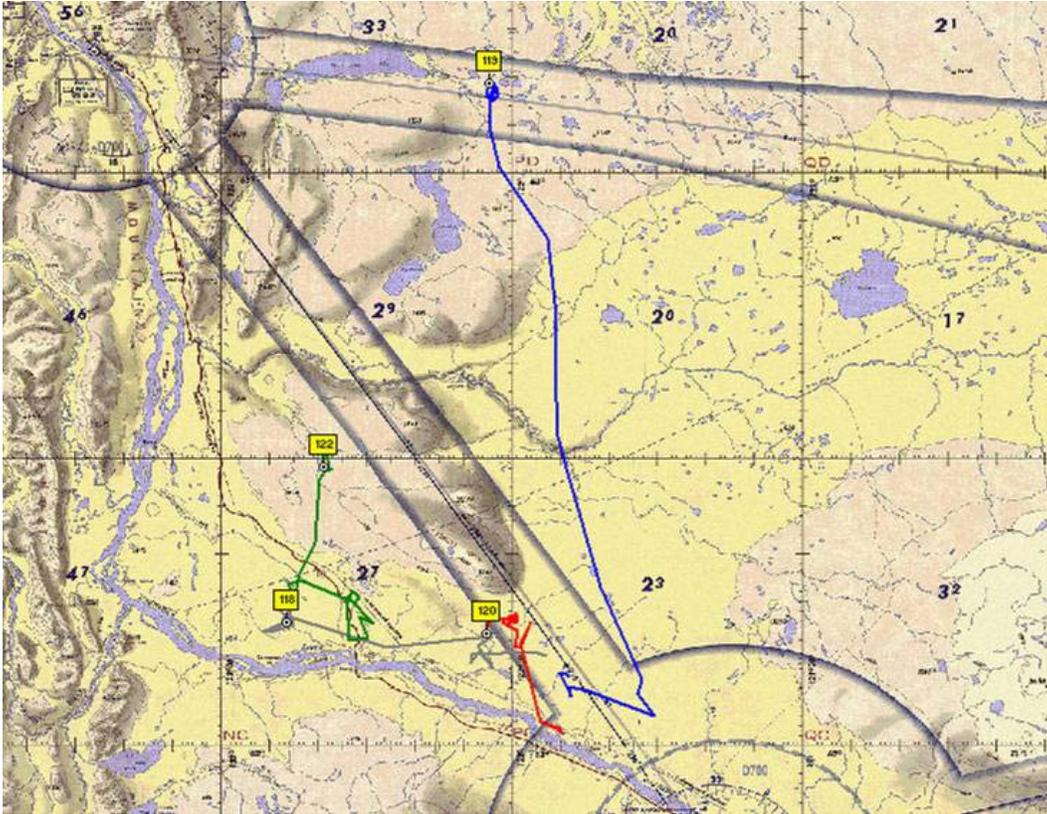


Figure 4. The wide dispersal of 4 collared females prior to the onset of the calving season.

During fall group size increased and was largest during winter. Group sizes of up to 14 were not uncommon. Similar seasonal changes in group size have been documented in the Inuvik region (Nagy et al 2005). During winter we observed the greatest movements both in distance and direction. It was not unusual to see minimum straight-line distances between locations (3 days apart) of up to 20km. One animal moved 125km north between 4 successive locations. Collared females made movements in and out of groups during winter and sometimes joined groups with other collared females.

We calculated an annual home range size based upon 10 months of data and approximately 125 locations per currently collared female boreal caribou. This is not strictly an annual home range estimate being based on only 10 months of data. Using the minimum convex polygon estimator to determine range, the 3 currently collared caribou had ranges of 432.5km², 1060.3km², and 2739.6km²; average of 1410.8km² (Fig. 5). The range sizes we report are similar to those reported from the Cameron Hills area (D. Johnson pers. comm.) and Trout Lake area (Larter and Allaire 2005), but are somewhat smaller than those reported for the Inuvik region (Nagy et al. 2005).

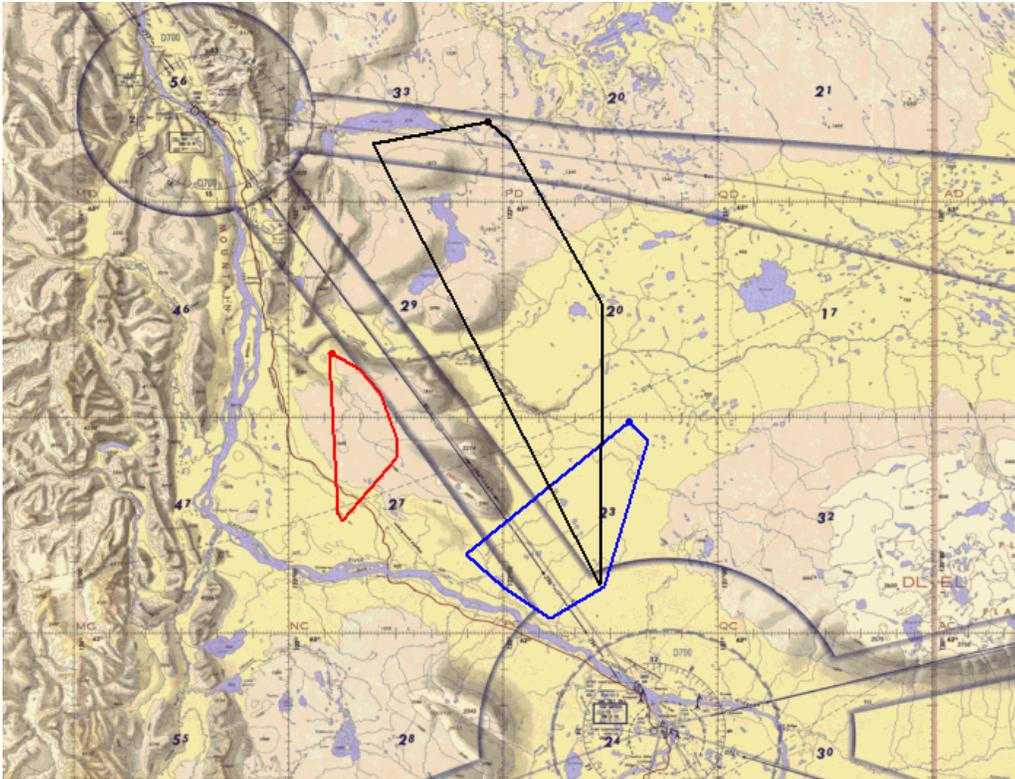


Figure 5. The minimum convex polygon of the ranges of 3 collared female boreal caribou from 1 April 2005 – 11 January 2006, based upon 120-125 locations.

Traditional knowledge from local harvesters and elders indicated the likelihood of an east-west migration of boreal caribou across the Mackenzie River and a north-south migration from the Ebbutt Hills area. We observed caribou crossing the Mackenzie River during late-winter and one collared caribou spent much of the year in the Fish Lake-Willowlake River area. The analysis of DNA from captured and harvested boreal caribou indicates north-south and east-west gene flow patterns.

We realize the need to increase the number of collared animals in this area, especially given the mortalities over the past year. An additional 9 collars were deployed into an enlarged study area during 20-22 January 2006. Five of these collars are satellite collars with the same duty cycle as the satellite collars already on caribou in the study area. Four collars are VHF collars which require us to track their locations by relocating them from the air. We will be increasing the number of relocation flights this year to monitor these collared animals. Maps showing animal movements will be provided to local First Nations on a monthly basis and annual progress reports will updating the caribou program.

We have recently experienced satellite transmission problems from one of the collars in this study (animal #122) and 2 of the collars in the Trout Lake study. We are working with the manufacturing company to try and determine the cause(s) and to rectify the situation. All newly deployed collars are functioning as expected.

References

Larter NC, Allaire DG. 2005. Trout Lake boreal caribou study progress report, February 2005. ENR Fort Simpson.

Nagy JA, Aurait A, Wright W, Slack T, Ellsworth I, Kienzler M. 2005. Ecology of boreal woodland caribou in the Lower Mackenzie Valley, NT: April 2003-November 2004.

Personal Communications

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A time line of each collared caribou over the past year.

Animal # 118

- 4 March collared
- 21 March seen in group of 10
- 30 March seen in group of 9
- 1 June no visual
- 4 June no visual
- Died before end of June, likely wolf predation
- 6 September collar retrieved

Animal # 119

- 4 March collared
- 21 March seen in group of ≥ 8
- 30 March no visual
- 1 June seen alone (no calf)
- 23 September no visual
- 10 October no visual

Animal #120

- 4 March collared
- 21 March seen in group of 13
- 30 March seen in group of 3
- 1 June no visual
- 4 June seen alone (no calf)
- 23 September seen in group of 14
- 10 October no visual

Animal #121

- 4 March collared
- 21 March seen in group of 3
- 26-27 March predated by wolves
- 30 March collar retrieved

Animal # 122

- 4 March collared
- 21 March seen in group of 3
- 30 March seen in group of 3
- 1 June seen alone (no calf)
- 4 June no visual
- 23 September no visual
- 10 October no visual