



Dehcho Boreal Caribou Study Progress Report, April 2019

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Photo: GNWT/D. Allaire, ENR

A TRIBUTE TO DANNY ALLAIRE

The boreal caribou world was shocked by the sudden passing of Danny Allaire (ENR Fort Simpson) on 12 January 2019. Danny was an integral part of the Dehcho Boreal Caribou Study since its inception in 2004. Danny maintained the location database for all boreal caribou collared in the study and completed all of the GIS analysis and created all the maps that have been key components of our progress reports. Danny was also an avid photographer. Many of his photos are featured in our progress reports. Danny was a caribou classifier extraordinaire! This talent was crucial to not only the Dehcho annual sex and age classification survey, but to classification surveys for the North and South Slave studies over the years. Danny loved field work and being out on the land, he was responsible for retrieving many of the collars from caribou that had either died during the study or released on schedule. The consummate professional, Danny was out retrieving collars just weeks before he was too ill to continue working. Danny has left a lasting legacy of commitment and dedication to boreal caribou conservation. He will be greatly missed.





The Dehcho boreal caribou study was initiated in 2004 with the deployment of ten satellite collars on adult female caribou at the request of, and after consultation with Smbaa K'e Dene Band. Extensive consultations in response to requests from other First Nations since have increased the study area and number of First Nations partners in this study. From 2004-2019 a total of 195 collars (mostly ARGOS DS or GPS) have been deployed on 179 adult female boreal caribou and 16 adult male boreal caribou (Appendix 1, Figure 1). The first males were collared in 2017; their movements and locations during the rut being of particular interest. A more detailed background history of the program, the collars used, and the deployment procedures can be found in Larter and Allaire (2010).

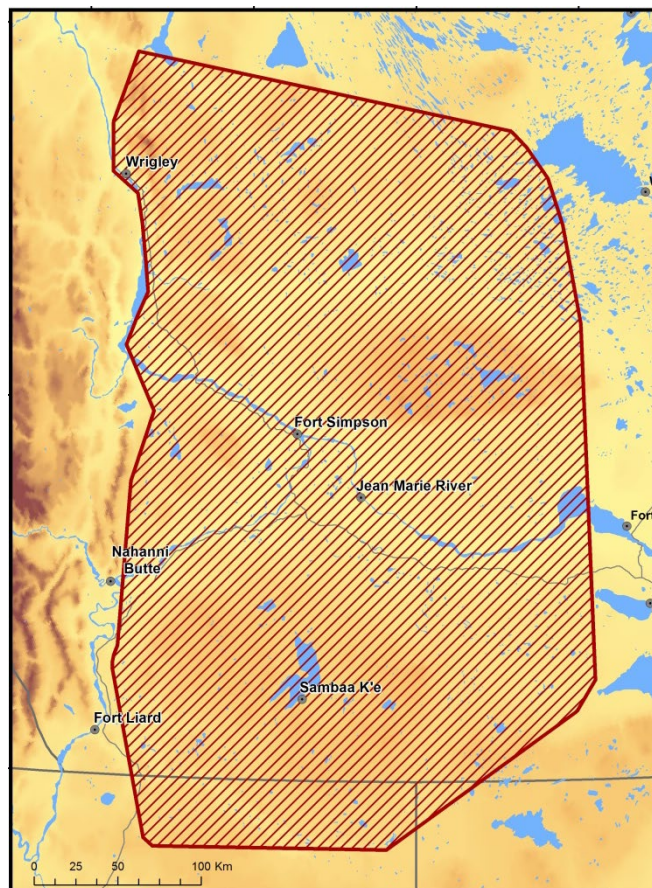


Figure 1. The Dehcho boreal caribou study area (115,952 km²), based upon the locations of satellite/GPS collared adult female and male boreal caribou.

Home Ranges

To date, 135 collared (DS or GPS) female caribou have provided locations for ≥ 12 months, with 89 providing locations for ≥ 24 months. We used all locations for these 135 caribou to calculate 100% minimum convex polygons (MCP) (Figure 2). The MCP is a line connecting all of the outside points where a specific caribou has been located and represents the cumulative range used by individual female caribou. For one female caribou, originally collared in the Cameron Hills (Johnson 2007) and recaptured near Trainor Lake in February 2007, we calculated her home range only from post-recapture locations. Mean range size was 3,118.70 km² (median 2,810.12 km²; range 260.6-14,419.9 km²). Home range sizes we report are similar to those reported for females in other study areas in the Northwest Territories (NWT) including the Cameron Hills and Hay River Lowlands (HRL) (Kelly and Cox 2011), Gwich'in study areas (means of *ca.* 3,000 km²; Nagy 2011), and the North Slave near Whatì (James Hodson personal communication).

Six collared male caribou have provided locations for ≥ 12 months with an average home range size of 2,608.3 km² (median 1,506.9 km²; range 520.9-9,344.1 km²; Figure 3). There are no comparative male home range sizes from elsewhere in the NWT.

Collared female and male caribou continue to move back and forth across the northeastern British Columbia (NE BC) border south of Trout Lake and Celibeta Lakes (Figures 2, 3).

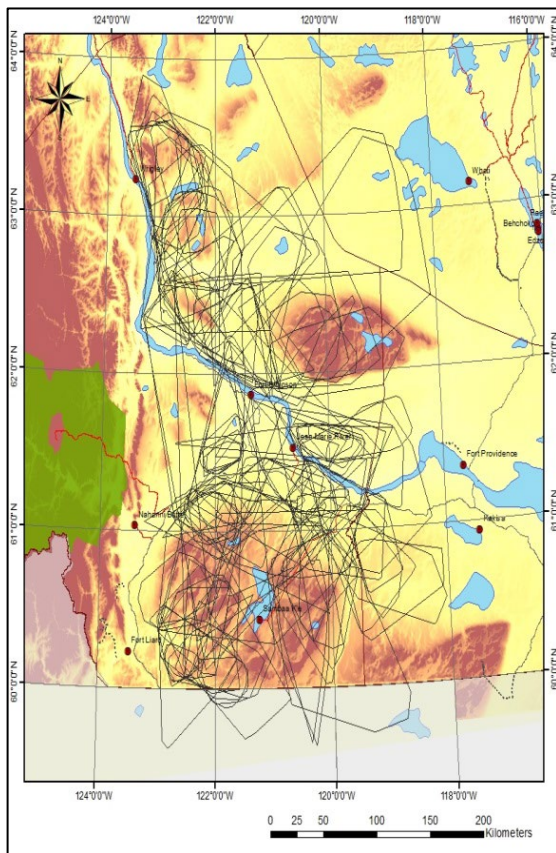


Figure 2. Cumulative ranges (100% MCP) of 135 collared female boreal caribou.

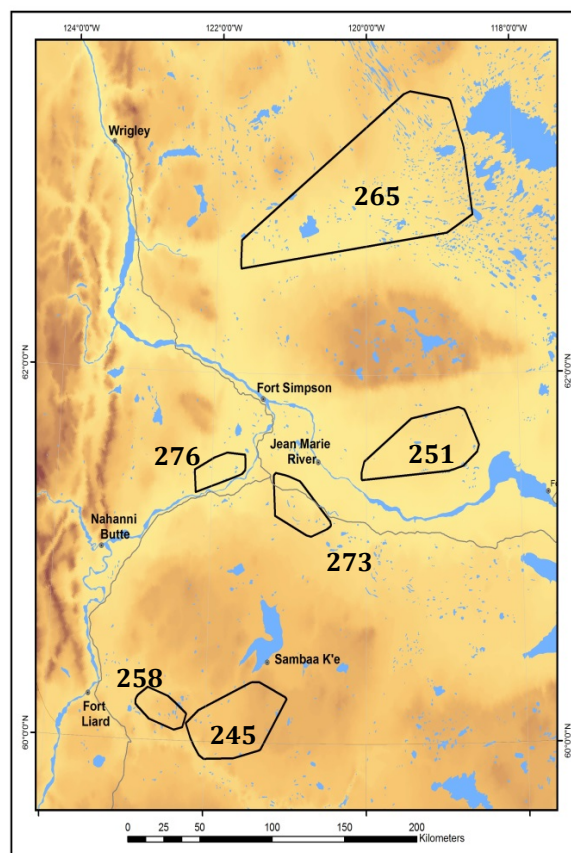


Figure 3. Cumulative ranges (100% MCP) of 6 collared male boreal caribou.

Calving and Calving Events

Boreal caribou, like other deer, have a high probability of conceiving after reaching maturity at two to three years old. Based upon the level of progesterone in blood serum, 92% (164 of 179) of collared females were pregnant; nine (5.0%) not pregnant and the remaining six borderline (Table 1). For 2019, all but 1 of 9 captured females tested positive for pregnancy; this female tested borderline. Similarly high levels of pregnancy based upon blood progesterone have been found in boreal caribou females residing in the South Slave (Kelly and Cox 2013), North Slave (James Hodson personal communication), and northern Saskatchewan (SK) (McLoughlin et al. 2019). The high number of births and pregnancies from collared females implies that capture and wearing a collar has not prevented females from becoming pregnant nor bearing calves.

Table 1. The number of blood samples indicating pregnant, borderline, and not pregnant for collared boreal caribou females 2004-2019. Pregnancy determination based upon progesterone levels in blood serum. No collaring occurred in 2011.

	2004	2005	2006	2007	2008	2009	2010	2012
Pregnant	10	12	10	16	7	7	17	14
Borderline	0	0	2	1	0	0	1	0
Not Pregnant	0	1	1	0	1	1	0	2
Total	10	13	13	17	8	8	18	16

	2013	2014	2015	2016	2017	2018	2019	Totals
Pregnant	10	12	11	8	8	13	9	164
Borderline	0	0	0	1	0	0	1	6
Not Pregnant	0	0	0	0	0	2	1	9
Total	10	12	11	9	8	15	11	179

Female boreal caribou spread out during the calving period, likely to avoid predation (Figure 4). Daily movement rates drop dramatically from *ca.* 6 km/day two days prior to calving, to *ca.* 0.2 km/day on the day of calving, and remain at ≤ 1 km/day for about a week post-calving (Nagy 2011). Looking at daily movement patterns of collared female caribou we can determine when and where a female boreal caribou calved or not; a reliable non-invasive way to monitor calving (Nagy 2011, Demars et al. 2013). Using movement data instead of flying aerial survey(s) reduces disturbance during the calving period, and does not risk surveying before calves are born or after newborn calves may have died, thus getting a more accurate assessment of calf production. Based upon 404 calving events, the peak of calving in our study area is 15 May ± 7 days; 49.7% of calves have been born by 14 May.



Using movement data, we determined the potential calving events for all collared caribou (2004-2018) where we had location data from 1 May - 1 June. Of 404 potential calving events (from 157 females), there were 378 births (94%) and 21 times (5%) when a caribou did not give birth. In five cases calving or not could not be determined.

In May 2018, 33 of 38 collared females calved. Calving events could not be determined for caribou 228 or caribou 237. Calves were born from 7-22 May with 73% born by 15 May. Caribou 257, 264 and 268 did not calve.

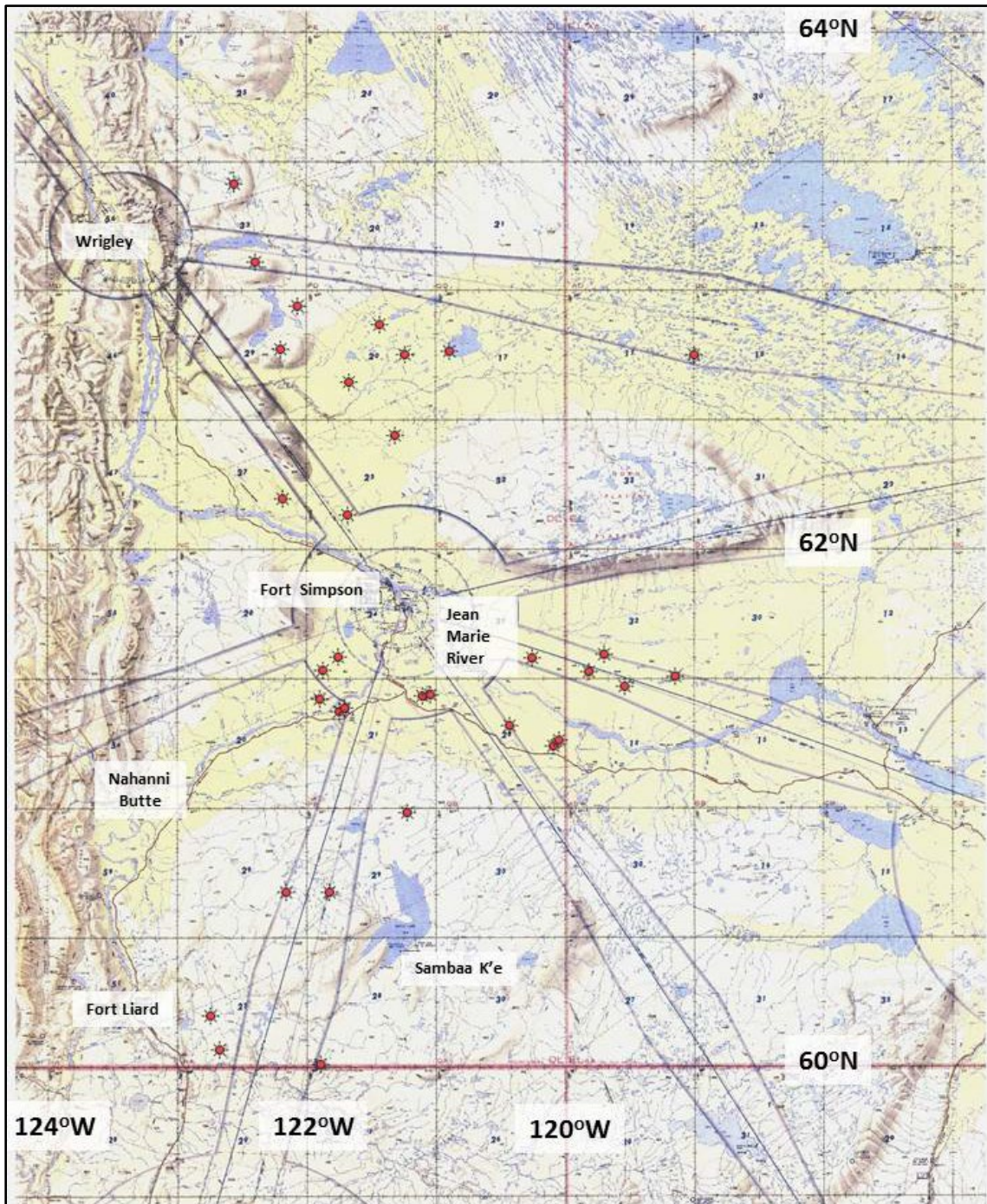


Figure 4. Calving locations of collared boreal caribou ● during 7-22 May, 2018. Note the wide dispersal throughout the range.

Timing and Fidelity of Calving

Individual females have remarkable consistency in calving dates. Of two females that calved successfully for six consecutive years, one had all of her calves within a four day

period. Thirty-seven females have calved successfully for four consecutive years: two females had three calves born on the same date and five females had all of their calves born within a four-day span. In most years as many as five calves are born to collared caribou on the same day.

We determined the Julian date for all of the 378 calving events from 2004 - 2018. The Julian date is the continuous count of days from January, and in leap years the Julian date of calving would be one more than in non-leap years. Interestingly, there is evidence of a decreasing trend in Julian date of calving females (Figure 5). This implies that calving dates of female boreal caribou in our study area are earlier in 2018 than in 2004. Why calving in 2013 was so late is unknown.

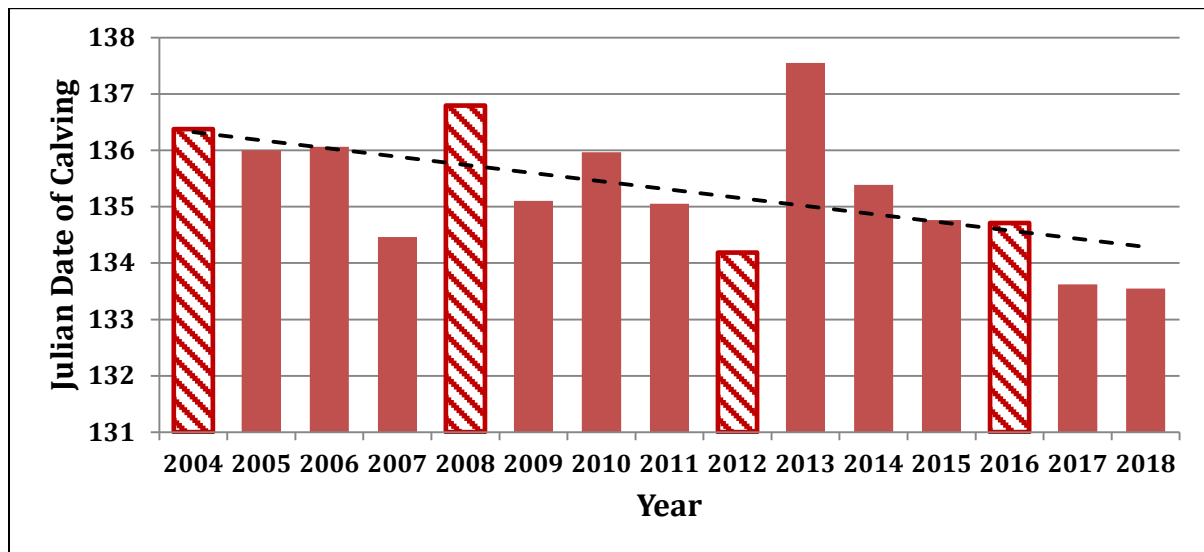


Figure 5. The mean annual Julian date of calving by collared female boreal caribou in the Dehcho study area from 2004 - 2018. Leap years indicated by diagonal lines.

Whether or not collared caribou show fidelity to calving location is a topic of great debate. From this study we know that female caribou can live to 22 years, have a calf as early as two years and as late as 21 years, and have an average home range of *ca.* 3,100 km². We have four consecutive calving events for 37 females and six consecutive calving events for two females. This provides information for only up to about one-quarter of a potential maximum 19 calving events in a lifetime. However, fidelity to an area for calving for four to six six-year period may have implications related to disturbance mitigation.

Some females calve in the same general area while others do not. Six females had successive calving locations <300 m distant. The average distance between four calving locations for one female was <500 m, contrastingly, for six females the average distance between four calving locations was >30 km.

Breeding Season and Male Caribou

Nagy (2011) used movement rates of satellite collared boreal caribou in the southern NWT to determine activity periods. Peak breeding was defined as 20 September - 4 October. Four collared males moved very little during the breeding period in 2017

(Table 2), possibly implying that breeding males stay in small areas waiting for females to come to them for breeding. Individual females get bred on a remarkably consistent date year after year, based upon consistency of calving dates. From the 2018 breeding season we have a second year of information for one male and a first year of information from four additional males (Table 2, Figure 6). Based upon ≥ 30 locations/male/year the average range used during the breeding season annually was 229 km² (Table 2, Figure 6). Ranges in 2018 were generally smaller than those in 2017. The male with movement data for two consecutive breeding seasons showed fidelity to the area and a consistently small size of range (Figure 6). These data further support the hypothesis that males wait in small discrete areas for females to come to them for breeding.

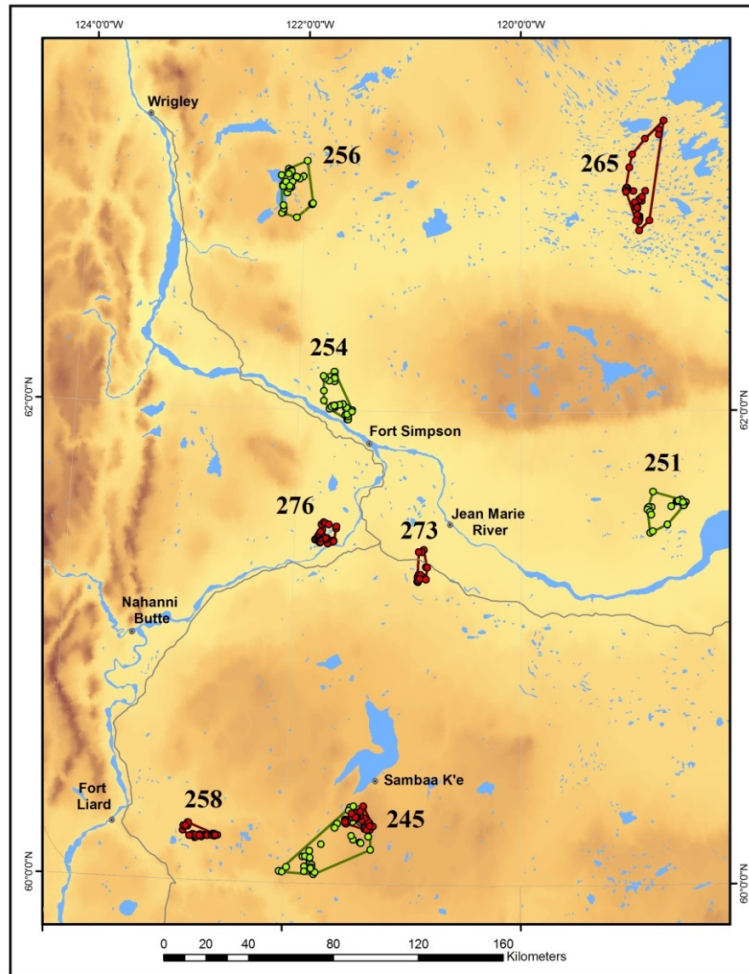


Figure 6. The locations (coloured dots) and areas used by eight collared male boreal caribou during the peak of the breeding season 20 September - 4 October. Green for 2017, red for 2018, note male 245 has data for two years. Polygons are 100% minimum convex.

Table 2. The areas (km²) used by the eight males during the peak breeding season (20 September - 4 October) and the number of locations used to calculate the area. For male 245 we have two years of data.

	245	251	254	256	258	265	273	276
Locations - 2017	45	31	33	45	n/a	n/a	n/a	n/a
Area (km ²) - 2017	573	109	157	300	n/a	n/a	n/a	n/a
Locations - 2018	45	n/a	n/a	n/a	35	42	16	44
Area (km ²) - 2018	83	n/a	n/a	n/a	61	481	52	70
Locations - pooled	90	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Area (km ²) - pooled	695	n/a	n/a	n/a	n/a	n/a	n/a	n/a

February/March Classification Survey

This survey is conducted with a helicopter because we need to see all collared caribou and determine the sex/age class of all other caribou we see. Caribou are classified into calves (9-10 months old), yearlings (21-22 months old), females (≥ 32 months old), and males (≥ 32 months old), based upon antler size and shape, and animal size. There is the potential for some yearlings to be mistakenly classified as females or males ≥ 32 months old. Photographs of caribou groups are used to verify classification and the presence of calves. We assume that calves of the year observed in this survey are recruited into the population.

The survey was flown 10-13 March 2019. Although we had sunny and clear conditions for the whole survey there had been no new snowfall for at least a week prior to the survey which sometimes made tracking challenging. Collared caribou were widely dispersed throughout the Dehcho, from Bulmer Lake to the Ochre River and down to NE BC. Our flight line was *ca.* 2,554 km, observing 331 boreal caribou, 24 moose, and two wolves (Table 3). This was the second most caribou classified, and the sixth survey of 14 that wolves were observed.

Boreal caribou have now been collared in three adjacent regions: Dehcho, South Slave, and North Slave. Individual caribou do not respect arbitrary boundaries and have wandered back and forth between regions. Regional classification surveys are scheduled in such a way as to maintain the consistency of observer classification and to maximize the efficiency of aircraft time and routing. In the past this has meant that during the Dehcho survey we relocate caribou collared as part of the South Slave study. However this year, two caribou collared in the Dehcho were located near Whatì and were classified during the North Slave survey (Table 3).

Fifteen of 36 collared females were observed with calves, estimating 41.7 calves per 100 adult females. Using all females observed in classification survey the estimate was slightly higher at 38.1 (Table 3). The ratios we report are similar to those reported from both the South Slave and North Slave surveys this March (Allicia Kelly personal communication; James Hodson personal communication). Despite annual variation in the number of calves per 100 adult females and the number of collared females, estimates of annual calves per 100 adult females has been similar over the course of the study (Appendix 3).

Table 3. The total number of caribou classified, and other wildlife observed, during sex/age classification surveys conducted in February-March, 2006-2019.

	2006	2007	2008	2009	2010	2011	2012
#of active collars	24	33	35	37	39 ¹	24 ²	30
Total # of caribou observed	170	216	241	291	235	161	197
# of groups observed	30	39	42	41	47	33	46
# of females (≥ 32 mo.)	94	114	145	160	128	74	104
# of calves (8-10 mo.)	27	26	34	50	45	33	40
# of yearlings (20-22 mo.)	13	6	1	1	1	2	1
# of males (≥ 32 mo.)	35	70	61	80	61	50	52
# unknown sex/age caribou	1	0	0	0	0	2	0
# of calves per 100 females	28.7	22.8	23.4	31.3	35.2	44.6	38.5
# of moose observed	18	38	15	31	23	22	25
# of wolves observed	2	1	0	0	0	0	0
Flight line length (km)	1,200	1,600	1,700	2,000	1,750	1,655	1,900

	2013	2014	2015	2016	2017	2018	2019
#of active collars	35 ²	32 ²	39 ¹	34	30 ¹	48 ²	46 ³
Total # of caribou observed	282	196	303	213	337	318	331
# of groups observed	46	42	44	46	56	67	69
# of females (≥ 32 mo.)	153	106	139	119	150	172	189
# of calves (8-10 mo.)	43	29	63	37	62	56	72
# of yearlings (20-22 mo.)	2	1	2	2	1	0	0
# of males (≥ 32 mo.)	84	59	99	53	117	90	67
# unknown sex/age caribou	0	1	0	2	7	0	0
# of calves per 100 females	28.1	27.4	45.3	31.1	41.3	32.6	38.1
# of moose observed	18	23	11	17	20	13	24
# of wolves observed	0	2	0	13	0	2	2
Flight line length (km)	1,865	1,787	2,242	1,966	2,845	2,941	2,554

¹ One collared animal located during the South Slave classification survey.

² Two collared animals located during the South Slave classification survey.

³ Two Dehcho collared animals were located during the North Slave classification survey.

Calf Survival/Recruitment

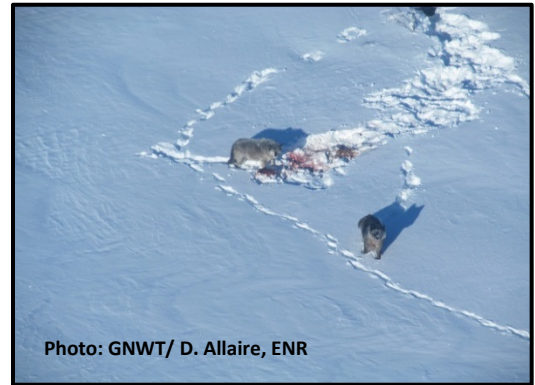
Larter et al. (2017) used the estimated number of calves per 100 adult females from all caribou observed on surveys (Table 3) to investigate whether the depth of snow in late winter had a significant effect on recruitment over 12 years (2006-2017). They found no significant effect over snow cover ranging from 41-89 cm. They found a similar result when using the estimated number of calves per 100 adult females based upon only collared animals (Appendix 3).

Twenty-seven of the collared females that calved in May 2018 were relocated in the March 2019 classification survey (the collars on four females with calves released during summer 2018). Of these 27 females, 11 were accompanied by calves resulting in

an estimated 41% survival. This is an above average overwinter survival mirroring the above average cow:calf ratio from the classification survey.

Caribou Deaths

Since the start of the study (March 2004), 80 collared caribou have died (78 females and two males). Most female caribou deaths (excluding harvest) occur between late-March and mid-July (65%; n=46). We have visited 64 potential female death sites successfully retrieving collars. Based on death site visits, suspected wolf predation (n=48; 62%) has been the greatest mortality factor. Seven caribou were harvested (9%), five died of natural causes associated with malnutrition (6%), and one was black bear predation (Table 4). The two male deaths occurred in April 2017 (of unknown causes) and August 2018 (of wolf predation). Visits to two other potential death sites this year confirmed collars were stationary because they had broken off.



We have age at death for 31 of the 80 caribou that have died during the study. Age at death is determined by counting stained cementum annuli on teeth (preferably the incisor), similar to counting the rings of a tree (Figure 7). June 1 has historically been used as the birth date for caribou (Matson 1981). Some boreal caribou in our study area live very long lives. One of the oldest caribou aged in North America is from this study, a 22 year-old female that had calves at 20 and 21 years of age (Larter and Allaire 2016). Nine other caribou have died as teenagers in our study (age range 4-22, mean 10.5, median 10 years; Figure 7).

Wolves have greater access to boreal caribou habitat by using seismic lines (Neufeld 2006), and increased access has resulted in more caribou mortalities (McLoughlin et al. 2003). Nagy (2011) reported that boreal caribou in the NWT use areas ≤ 400 m from anthropogenic linear features less than other areas, and travel faster when they encounter linear features. In this study the remains of 16 of 47 (34%) caribou predated by wolves or black bears were located ≤ 400 m from anthropogenic linear features. Two additional caribou were predated on a lake or a lake shoreline.

Table 4. The number of collared caribou (female and male) deaths and the suspected cause for each year of the study. Yearly percentages are reported in parentheses. The maximum number of collared animals for each calendar year is indicated.

April-March Year	Max. Collars	Total Deaths	Suspect Wolf (%)	Suspect Bear (%)	Harvest (%)	Natural Causes ¹ (%)	Unknown ² (%)
04/05	10	3	3 (100)	0	0	0	0
05/06	21	7	6 (85.7)	0	0	1 (14.3)	0
06/07	27	8	7 (87.5)	0	0	1 (12.5)	0
07/08	35	4	2 (50)	1 (25)	1 (25)	0	0
08/09	36	6	3 (50)	0	2 (33.3)	0	1 (16.7)
09/10	39	7	5 (71)	0	2 (29)	0	0
10/11	40	4	2 (50)	0	0	0	2 (50)
11/12	26	6	3 (50)	0	1 (16.7)	0	2 (33.3)
12/13	33	3	2 (66.7)	0	0	0	1 (33.3)
13/14	37	8	1 (12.5)	0	0	3 (37.5)	4 (50)
14/15	32	2	1 (50)	0	0	0	1 (50)
15/16	43	9	6 (66.7)	0	0	0	3 (33.3)
16/17	45	8 ³	5 (62.5)	0	0	0	3 (37.5)
17/18	57	3 ³	1 (33.3)	0	1 (33.3)	0	1 (33.3)
18/19	57	2	1 (50)	0	0	0	1 (50)
TOTAL		80	48	1	7	5	19

¹ This includes five caribou suspected of succumbing to malnourishment.

² The vast majority of these death sites have never been investigated.

³ A number of the unknown sites were investigated resulting in changes to their status.

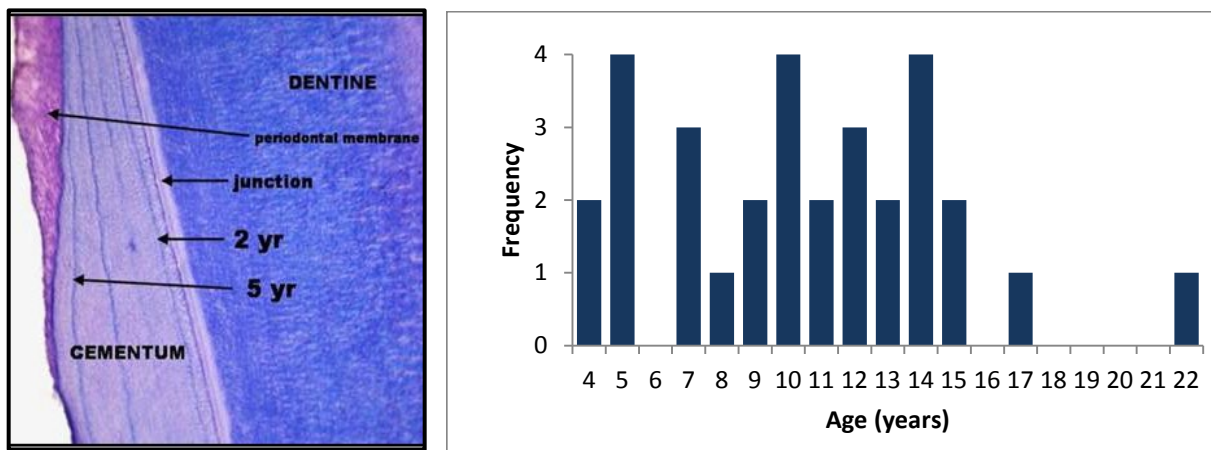


Figure 7. *Left:* The stained section of a tooth root. The dark blue lines are stained cementum. *Right:* The frequency of age at death for 31 female boreal caribou. Age was determined by counting cementum annuli.

Released Collars

This year, because it was a slow fire season, we were fortunate to receive a lot of access to helicopter time from Forest Management Division. We managed to retrieve 14 collars including many releases, some which had been on the ground for more than a year. Two of those collars (females #212 and #216) provided us with information on six

additional calving events. We also managed to determine that four collars were unretrievable. Of the almost 50 collars that have remained on caribou until their scheduled release date, this past year one collar did not release on schedule. The other seven collars released on schedule 15 June 2018. The unreleased collar continues to transmit location data to the satellite and should until at least the end of April 2020. The VHF has ceased to transmit. We may get an extra calving event from female #220. We were also able to determine that two of the male collars that had gone stationary had broken and fallen off. Retrieved collars are refurbished if possible.

Adult Female Survival

Annual adult female survival of collared females was based upon 32 females that were alive with functioning collars on 1 April 2018 and had functioning collars on 31 March 2019. We followed Kaplan and Meier (1958) and Pollock et al. (1989). Five collars released in summer and two collars that had not been transmitting since summer 2018, were not included in the analysis. One collar did not release on schedule was included in the analysis. Annual adult female survival estimated for 2018/2019 was 96.9% (Table 5); higher than all but one of the previous 13 years (Figure 8; range 62-100%, average 81.7%). We did not include estimates from 2004/2005 due to a small sample size (n=10) and a restricted area of deployment. Estimated annual adult female survival rates we report are similar to those reported for the Cameron Hills (81% average from five years; Kelly and Cox 2011), but lower than those for the HRL (86% average from seven years; Kelly and Cox 2011), the Gwich'in areas of the Lower Mackenzie ($\geq 95\%$ average from three years; Nagy 2011), for most populations in Alberta (AB) (range 78-91%; Hervieux et al. 2013) and SK (89.5% McLoughlin 2019). Low adult female survival reduces the population rate of increase.

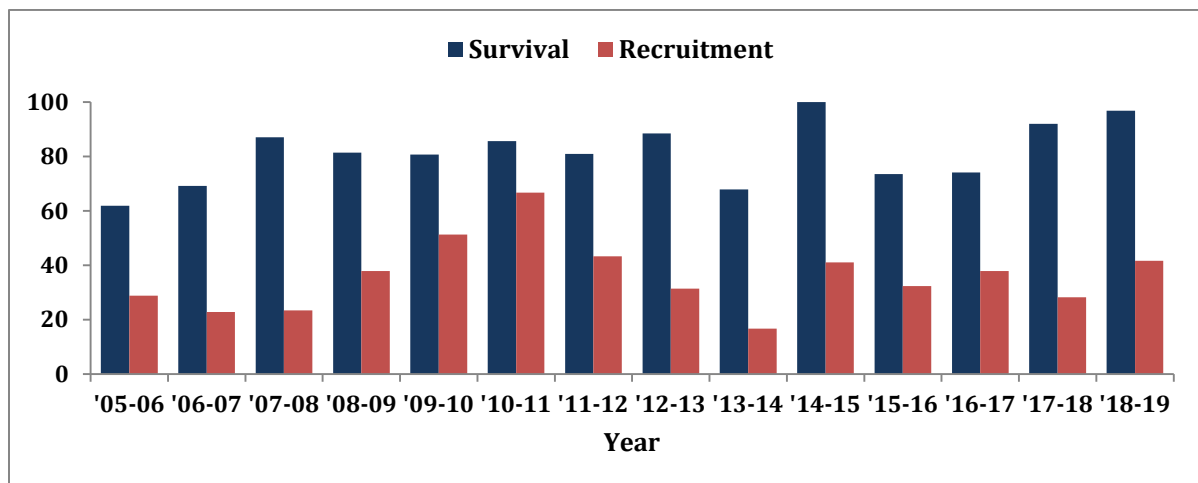


Figure 8. Adult female survival (%) and recruitment (calves:100 adult females in March) for the Dehcho study area from 2005/2006 to 2018/2019 based on radio collared female caribou.

Adult Male Survival

Of the five males collared in February 2018, four were observed during the February 2019 classification survey. The other male (#262) was killed by wolves in August 2018.

This limited sample size estimates an 80% annual survival. Unfortunately, of the five males collared in 2017, one collar broke, one male died, and another collar only provided sporadic transmissions during their first year; the remaining two collars broke off during year two. Six more collars were deployed on males in February 2019. We hope to deploy eight to ten collars on males in 2020 to ensure an adequate sample size to assess adult male survival and increase our confidence in documenting a lack of movement by males during the breeding period.

Estimated Population Rate of Increase

We based the λ estimate on annual female survival and calf:cow reported in March (Hatter and Bergerud 1991). We report estimated λ values, measured from April 1 - March 31, for the Dehcho using two different cow:calf estimates: 1) derived solely from collared animals and 2) derived from all animals observed in classification surveys. Because it is collared females that are used to estimate adult survival, and adult females are harvested, we feel an estimated calf:cow solely from collared females is the most appropriate estimation of recruitment assuming that the collared females are a representative sample of all females. Prior to 2009 sample sizes of collared females were small so we used the estimate derived from all animals for both. A rate of increase, or λ , of one indicates population stability, <1 indicates population decrease, and >1 indicates population increase. Small sample sizes affect the confidence of the estimate. A breakdown of the λ estimate by north and south Mackenzie areas can be found in Appendix 4.

Table 5. The estimated annual population rate of increase (λ) for 14 successive years. ¹Ratio and λ determined from collared caribou only. ²Ratio and λ determined from all caribou surveyed. *Due to small sample size of collared animals ratio determined from all caribou surveyed.

Year	Female Survival Rate	Calf:100 Females ¹	Calf:100 Females ²	Rate of Increase (λ) ¹	Rate of Increase (λ) ²
2005-2006*	0.6191	28.81	28.81	0.7232	0.7232
2006-2007*	0.6923	22.86	22.86	0.7817	0.7817
2007-2008*	0.8710	23.35	23.35	0.9861	0.9861
2008-2009	0.8148	37.83	31.25	1.0049	0.9657
2009-2010	0.8077	51.28	35.16	1.0862	0.9800
2010-2011	0.8571	66.67	44.59	1.2857	1.1031
2011-2012	0.8095	43.33	38.46	1.0334	1.0023
2012-2013	0.8846	31.43	28.11	1.0496	1.0293
2013-2014	0.6786	16.67	27.36	0.7403	0.7861
2014-2015	1.0000	41.03	45.32	1.2581	1.2930
2015-2016	0.7353	32.35	31.09	0.8772	0.8706
2016-2017	0.7419	37.93	41.33	0.9156	0.9352
2017-2018	0.9200	28.21	32.56	1.0711	1.0989
2018-2019	0.9688	41.67	38.09	1.2237	1.1967

Figure 9 shows how “good years”, ones with a combination of both high adult female survival and high recruitment, and conversely “bad years”, ones with low adult female survival and low recruitment, can have a major impact on annual population rates of increase. Over the past four or five years we have been fortunate in having more of the

good than bad years. The estimated average λ over the past 14 years is now 0.987 slightly below a value of 1 or stability (Table 5). However, the population has not completely recovered from the bad years earlier in the study. If we had a population numbering 1,000 adult female caribou in 2004 at the start of the study and applied our estimated annual λ , in 2019 the population would be 841 (95% CI 788-868) adult females (Figure 9).

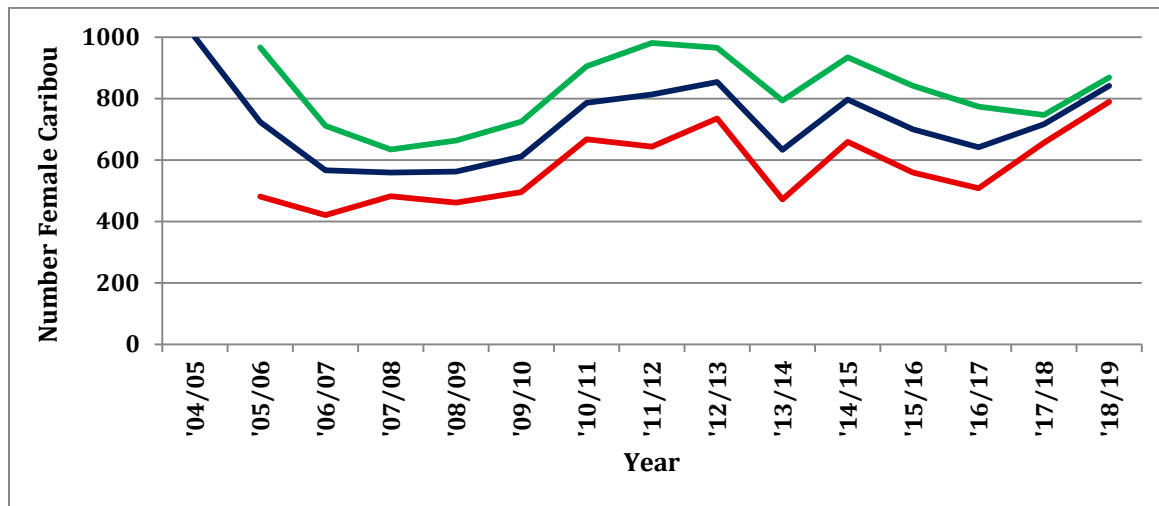


Figure 9. The estimated number of female caribou in each year of the study starting with a population of 1,000 and using the annual rates of increase (λ) calculated for the 14 successive years. The green and red lines represent the upper and lower 95% confidence intervals.

The population rate of increase we report ($\lambda = 0.99$ geometric mean over 14 years) is less than that reported for the Gwich'in area in the Lower Mackenzie over two to three years was $\lambda = 1.08-1.20$ (Nagy 2011). It is similar to the $\lambda = 1.00$ over three years reported from northern SK (McLoughlin et al. 2019), but greater than most boreal caribou populations in AB (Hervieux et al. 2013) and that found in the Cameron Hills (CH; $\lambda = 0.87$ mean over five years) study area (Kelly and Cox 2011). In the Gwich'in area both adult female survival and late winter calf:cow ratios are higher than in other study areas. Adult female survival is higher in HRL, CH, SK, and most populations in AB than in the Dehcho but the Dehcho consistently has higher late winter calf:cow ratios. Low calf recruitment may be a factor in reducing λ for HRL, CH, SK, and AB boreal caribou populations regardless of higher adult female survival. In recent years HRL has had increased recruitment based upon late winter calf:cow. This has resulted in an increasing λ .

Disease and Parasites

A previous study of boreal caribou in the Dehcho found them to be relatively disease and parasite free with low numbers of parasites and disease antibodies; none were a cause of concern (Johnson et al. 2010). Analysis of 18 fecal samples from February/March 2019 capture reported no positives for *Giardia* spp. or *Cryptosporidium* spp. and single occurrences of *Eimeria* spp., *Moniezia* spp. and a

trichostrongyle. These results are is similar to those reported since 2011; the prevalence of common diseases and parasites remains low.

We continue to provide serum samples to investigate a bacterium *Erysipelothrix rhusiopathiae*, which has been reported in boreal caribou populations in NEBC. This bacterium has the potential to adversely affect survival and reproduction (Schwantje et al. 2014). Of the 115 samples submitted 18 (15.7%) indicated exposure to the bacterium (Bryan Macbeth personal communication). Caribou that showed exposure to bacterium were located throughout the entire study area, not being confined to any geographic area.

Winter ticks (*Dermacentor albipictus*) were first documented on captured boreal caribou in the Dehcho and South Slave regions in 2015 (Brad Culling personal communication). Since then the prevalence of ticks had increased: one of nine caribou in 2016, four of 13 in 2017, and ten of 20 in 2018. Interestingly, during the 2019 capture no ticks were found on any of the 18¹ caribou captured in the Dehcho. Not only was there a noticeable absence of ticks, but also a noticeable absence of animals showing hair loss both during the capture operations and the classification survey. This past winter was the first one in a number of years where temperatures had been below -40C for an extended period of time.



Present and Future of the Study

We continue to work collaboratively with other researchers conducting boreal caribou studies, see Deliverables. Data from this study have been incorporated into various territorial-wide analyses, and used as part of a Master's program at the University of AB. Data are being used by The Department of Environment and Natural Resources (ENR) in the development of range management plans for boreal caribou. The boreal caribou program was endorsed by delegates of the 9th biannual regional wildlife workshop, in October 2018. Delegates support the continued monitoring of boreal caribou in the region by maintaining an adequate number of collared female and male boreal caribou. Program results will be updated and the program critiqued at the tenth biennial Dehcho regional wildlife workshop, in Fort Simpson, October 2020.

We continue to make every attempt to visit death sites during and to retrieve collars so they can be refurbished for re-deployment. We will continue to deploy only GPS collars with release mechanisms on both female and male caribou.

Deliverables

ENR provides this annual progress report to its First Nations partners, to the Western Northwest Territories Biophysical Study, and to the Cumulative Impacts Monitoring Program. The report is posted on the ENR website. ENR provides quarterly maps to its First Nations partners. The maps show the ranges used by individual collared female caribou over the previous three months. Unfortunately due to the high demand of work

¹This includes one female caribou captured in the Wrigley area as part of a different study.

related duties this year, a map from September 2017 – March 2018 was provided to First Nations. ENR has since resumed providing quarterly maps to its First Nations partners.

A scientific paper was recently published.

Jung, T.S., N.C. Larter and D.G. Allaire. 2019. Social organization of boreal woodland caribou (*Rangifer tarandus caribou*) in response to decreasing annual snow depth. Mammal Research 64DOI 10.1007/s13364-019-00420-x

A scientific paper is being prepared for submission.

Larter, N.C. T.S. Jung and D.G. Allaire. In prep. Calving by boreal caribou 2004-2018: Evidence of earlier calving and a lengthening calving period. European Journal of Wildlife Research

A presentation and a critique of the study were made at the ninth biennial Dehcho Regional Wildlife workshop in Fort Simpson, October 2018. The presentation and discussion are part of the workshop final report which has been distributed and posted on the ENR website.

Collaborative use of data collected as part of the Dehcho study was incorporated into poster presentations for the 17th North American Caribou Workshop in Ottawa, and the AB Chapter of the Wildlife Society outlined below.

Temporal patterns in boreal caribou mortality: factors limiting caribou survival in an intact environment. Allicia P. Kelly, Nicholas C. Larter, Eliezer Gurarie, Danny Allaire, Evelyn Merrill, and Andrew E. Derocher.

Multi-regional comparisons among woodland caribou populations reveal geographic patterns of body condition and pregnancy in Ontario, British Columbia, and Northwest Territories. John G. Cook, Rachel C. Cook, Glen S. Brown, Brad A. Culling, Diane E. Culling, Allicia Kelly, Megan E. Watters, Dale R. Seip, Nicholas C. Larter, Ashley McClaren, and Krista Sittler.

Modest overwinter changes in body condition suggests environmental conditions on summer-autumn ranges control annual patterns of body condition of woodland caribou in Northwest Territories. John G. Cook, Rachel C. Cook, Brad A. Culling, Diane E. Culling, Allicia Kelly, Ashley McLaren, and Nicholas C. Larter.

An inter-jurisdictional scan of spatial structure of caribou populations. S. Wilson, G. Sutherland, N. Larter, A. Kelly, A. McLaren, J. Hodson, T. Hegel, R. Steenweg, D. Hervieux, and T. Nudds.

Seasonal patterns in body condition of adult, female woodland caribou: Evidence for a summer nutritional bottleneck with implications to mortality risk in southern Northwest Territories. John G. Cook, Allicia Kelly, Rachel C. Cook, Brad A. Culling, Diane E. Culling, Ashley McLaren, and Nicholas C. Larter.

Data from this study were used in a report by ABMI on the Influence of climate on the demography of woodland caribou. C. DeMars, R. Serrouya, S. Gilbert, A. Kelly, N. Larter, and S. Boutin.

We continue our collaborative work on nutritional condition of boreal caribou in western Canada with the South Slave and the National Council for Air and Stream Improvement (NCASI).

Acknowledgements

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Allicia Kelly provided comparative data from the South Slave region. James Hodson provided comparative data from the North Slave region. Forest Management, Department of Environment and Natural Resources (ENR), Fort Simpson, provided access to helicopter fuel for collar deployment and the March survey; they also provided substantial helicopter support which let us retrieve over a dozen collars. Woods Hole Groups, Metocean Telematics, Vectronics Aerospace, and AssetLink Global LLC provided satellite location data. Telonics and Vectronics Aerospace provided GPS collars. Matson's Lab aged caribou teeth. Great Slave Helicopters provided aircraft for the March classification survey and collar retrievals. Trinity Tactical Consulting deployed collars. Funding for the past year came from Wildlife Division, ENR, and the Western Northwest Territories Biophysical Study (GNWT). Judy Williams and Cyprian Ngolah downloaded location data from retrieved collars and transferred the historic data into the Wildlife Management Information System (WMIS) system for future collaborative work.

Personal Communications

Brad Culling, Diversified Environmental Services, Fort St. John, BC
James Hodson, ENR Wildlife, Yellowknife, NT
Allicia Kelly, ENR Wildlife, Fort Smith, NT
Bryan Macbeth, DVM, PhD., University of Calgary, Calgary, AB

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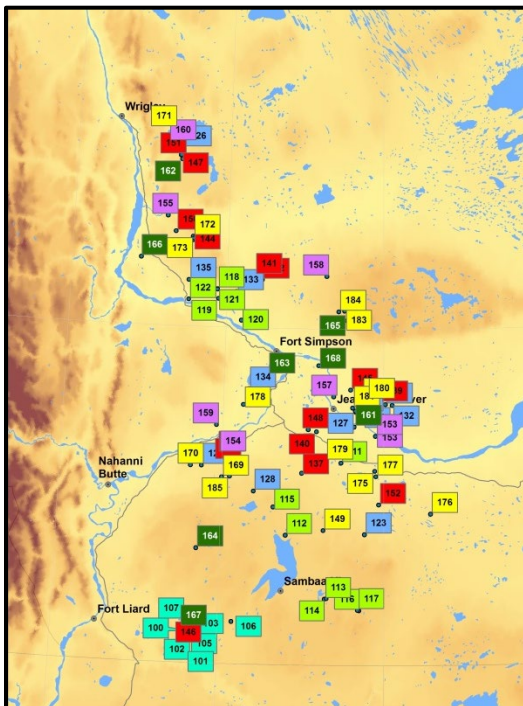
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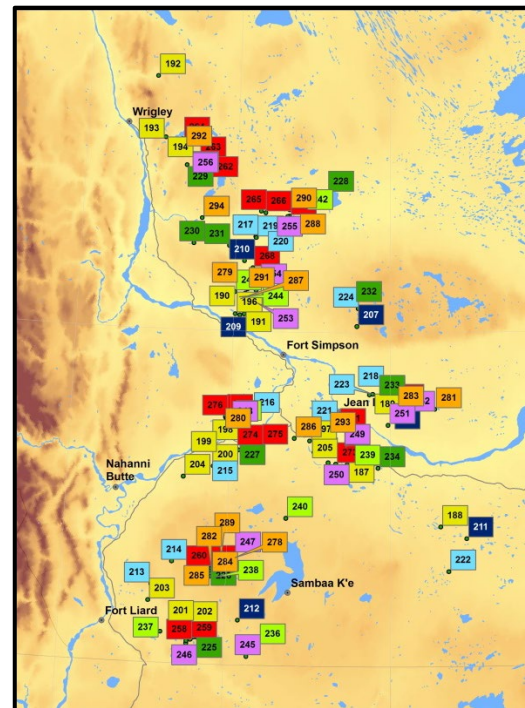


Appendix 1. The number and type of collars deployed on adult females during the study are shown in the table. Note: all but one of the Recon 4660-3 and 4660-4 collars were deployed on adult males; one was accidentally deployed on a female (2019). The locations where collars were deployed on individual caribou during the study are shown in the figures.

Date caribou collared	Satellite (ST-20-3610 or TAW-4610H)	GPS (TGW-3680 or TGW-4680)	GPS (TGW-4670) Iridium	VHF (Mod 600)	Vectronic GPS-PLUS 2	Recon (4660-3-4) males	Totals
March 2004	10						10
March 2005	13						13
January 2006	9			4			13
January 2007	8	9					17
February 2008	4	4					8
February 2009	1	7					8
February 2010	9	9					18
February 2012	2	14					16
February 2013	1	8			1		10
February 2014		12					12
February 2015		9			2		11
February 2016		5	3		1		9
February 2017			8			5	13
February 2018		4	11			5	20
Feb/Mar 2019		9	2			6	17
TOTAL	57	90	24	4	4	16	195



Locations of 87 female boreal caribou collared in 2004, 2005, 2006, 2007, 2008, 2009, 2010 (see colour for locations).



Locations of 108 female boreal caribou collared in 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019 (see colour for locations).

Appendix 2. Collar retrievals during the past year.

- 31 July, 2018, helicopter to Rabbitskin, Checkpoint and Antoine Lake areas retrieving female caribou collars #216, 221, and 223. #216 had four years of data on board that had not been transmitted to the satellite.
- 1 August, 2018, helicopter to Bulmer, Greasy, and Fish Lakes area in the north and the Arrowhead and Celibeta Lakes area in the south, retrieving male caribou collar #254 discovering that the collar had broken and dropped off, and retrieving female caribou collars #214, 217, 225, 229, 238, 244, and 247. Female collar #231 was deemed unretrievable.
- 10 September, 2018, helicopter to the Bovie and Celibeta Lakes area retrieving female caribou collar #212 she had over three years of data on board that had not been transmitted to the satellite. Female collars #189 and 218 were deemed unretrievable.
- 11 September, 2018, helicopter to Willowlake River area, retrieved male collar #262. Female collar #195 was deemed unretrievable.
- 1 November, 2018 helicopter towards Mills Lake, retrieved male collar #251 discovering that the collar had broken and dropped off.
- 13 February, 2019, helicopter to BC border, unable to retrieve male collar #245 could be kill site or broken collar; will retry in May 2019 after snowmelt.
- Nine of the retrieved female collars were refurbished and deployed in February/March 2019.

Appendix 3. Annual estimates of cow:calf derived from only collared females and from all caribou classified in spring air surveys and a weighted average over all surveys. n/a indicates no value calculated because of small sample size ($n < 12$).

Year	05/06	06/07	07/08	08/09	09/10	10/11	11/12	12/13	13/14
Collars	n/a	n/a	n/a	37.83	51.28	66.67	43.33	31.43	16.67
All	28.72	22.81	23.35	31.25	35.16	44.59	38.46	28.11	27.36

Year	14/15	15/16	16/17	17/18	18/19	Avg.
Collars	42.01	32.35	37.93	28.21	41.67	38.95
All	45.32	31.09	41.33	32.56	38.10	33.45

Appendix 4. The estimated annual population rate of increase (λ) for 14 successive years. Rates for the south Dehcho are calculated for caribou collared south of the Mackenzie River, rates for the north Dehcho for caribou collared north of the Mackenzie River. Calf:100 Females derived from collared females only.

South Dehcho

Year	Female Survival Rate	Calf:100 Females	Rate of Increase (λ)
2005-2006	0.6250	25.87	0.7179
2006-2007	0.6429	26.16	0.7396
2007-2008	0.9412	25.84	1.0808
2008-2009	0.9333	39.13	1.1604
2009-2010	0.9375	45.83	1.2162
2010-2011	0.7333	58.33	1.0353
2011-2012	0.8750	24.43	0.9968
2012-2013	0.9231	55.55	1.2781
2013-2014	0.6429	20.00	0.7143
2014-2015	1.0000	42.11	1.2667
2015-2016	0.6875	23.53	0.7792
2016-2017	0.7647	33.33	0.9176
2017-2018	0.8181	16.67	0.8926
2018-2019	1.0000	33.33	1.2000

North Dehcho

Year	Female Survival Rate	Calf:100 Females	Rate of Increase (λ)
2005-2006	0.6000	33.18	0.7193
2006-2007	0.7500	19.99	0.8333
2007-2008	0.7857	19.64	0.8713
2008-2009	0.6667	35.71	0.8116
2009-2010	0.6000	60.00	0.8571
2010-2011	1.0000	75.00	1.6000
2011-2012	0.7692	62.50	1.1189
2012-2013	0.8462	5.88	0.8718
2013-2014	0.7143	13.33	0.7653
2014-2015	1.0000	40.00	1.2500
2015-2016	0.7778	41.18	0.9794
2016-2017	0.7143	42.86	0.9091
2017-2018	1.0000	38.10	1.2353
2018-2019	0.9412	50.00	1.2549

Appendix 5. A timeline of each collared caribou since 2004. The collar type (GPS, Sat = Satellite, VHF) is noted as well as whether most recently only VHF signals are being received. **Black font** indicates currently active collars on caribou. **Blue font** indicates released caribou collars. **Green font** indicates unknown status/no release mechanisms on caribou collars. **Red font** indicates collars of known dead caribou. **Orange font** indicates collars of known dead caribou where death was natural causes which included being related to malnutrition. **Purple** indicates collars of known harvested caribou.

Caribou #294 (GPS, Recon, male)

- 4 Feb/19 collared
- 10 Mar/19 seen with another bull

Caribou #293 (GPS, Argos)

- 19 Mar/19 collared

Caribou #292 (GPS, Argos)

- 4 Feb/19 collared
- 10 Mar/19 seen in group of 7 without calf

Caribou #291 (GPS, Argos)

- 3 Feb/19 collared
- 12 Mar/19 seen in group of 9 without calf

Caribou #290 (GPS, Recon, male)

- 4 Feb/19 collared
- 10 Mar/19 seen alone

Caribou #289 (GPS, Argos)

- 2 Feb/19 collared
- 11 Mar/19 seen in group of 5 without calf

Caribou #288 (GPS, Recon, female)

- 4 Feb/19 collared
- 10 Mar/19 seen in group of 15 with calf

Caribou #287 (GPS, Recon, male)

- 3 Feb/19 collared
- 10 Mar/19 seen in group of 3

Caribou #286 (GPS, Iridium)

- 19 Mar/19 collared

Caribou #285 (GPS, Argos)

- 2 Feb/19 collared
- 11 Mar/19 seen in group of 5 with calf

Caribou #284 (GPS, Iridium)

- 2 Feb/19 collared
- 11 Mar/19 seen in group of 4 with calf

Caribou #283 (GPS, Argos)

- 1 Feb/19 collared
- 12 Mar/19 seen in group of 3 with calf

Caribou #282 (GPS, Argos)

- 2 Feb/19 collared
- 11 Mar/19 seen alone

Caribou #281 (GPS, Recon, male)

- 1 Feb/19 collared
- 12 Mar/19 seen with another bull

Caribou #280 (GPS, Recon, male)

- 3 Feb/19 collared
- 12 Mar/19 seen in group of 8 caribou

Caribou #279 (GPS, Argos)

- 3 Feb/19 collared
- 12 Mar/19 seen in group of 14 without calf

Caribou #278 (GPS, Argos, male)

- 2 Feb/19 collared
- 11 Mar/19 seen in group of 4 with #226

Caribou #277 (GPS, Iridium)

- 8 Feb/18 collared
- 5 Mar/18 seen in group of 8 without calf
- 12 Mar/19 seen in group of 9 without calf

Caribou #276 (GPS, Recon, male)

- 8 Feb/18 collared
- 5 Mar/18 seen in group of 2
- 12 Mar/19 seen in group of 5

Caribou #275 (GPS, Iridium)

- 7 Feb/18 collared
- 5 Mar/18 seen in group of 11 with #274 without calf
- 11 Mar/19 seen in group of 6 without calf

Caribou #274 (GPS, Iridium)

- 7 Feb/18 collared
- 5 Mar/18 seen in group of 11 with #275 without calf
- 13 Mar/19 seen in group of 3 without calf

Caribou #273 (GPS, Recon, male)

- 7 Feb/18 collared
- 6 Mar/18 seen in group of 6
- 13 Mar/19 seen in group of 3 bulls

Caribou #272 (GPS, Iridium)

- 7 Feb/18 collared
- 6 Mar/18 seen in group of 8 without calf
- 11 Mar/19 seen in group of 5 with calf

Caribou #271 (GPS, Iridium)

- 7 Feb/18 collared
- 6 Mar/18 seen in group of 8 with calf
- 11 Mar/19 seen in group of 4 without calf

Caribou #270 (GPS, Iridium)

- 7 Feb/18 collared
- 5 Mar/18 seen in group of 7 without calf
- 12 Mar/19 seen in group of 3 with calf

Caribou #269 (GPS, Argos)

- 7 Feb/18 collared
- 5 Mar/18 seen in group of 7 without calf
- 12 Mar/19 seen in group 7 with calf

Caribou #268 (GPS, Iridium)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 3 with calf
- 10 Mar/19 seen in a group of 7 with #253 without calf

Caribou #267 (GPS, Iridium)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 8 without calf
- 10 Mar/19 seen in group of 11 without calf

Caribou #266 (GPS, Argos)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 9 without calf
- 10 Mar/19 seen in a group of 12 without calf

Caribou #265 (GPS, Recon, male)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 9
- 12 Mar/19 seen in a group of 5 bulls

Caribou #264 (GPS, Iridium)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 3 with calf
- 10 Mar/19 seen in a group of 3 without calf

Caribou #263 (GPS, Argos)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 6 without calf
- 10 Mar/19 seen in a group of 4 without calf

Caribou #262 (GPS, Recon, male, died)

- 6 Feb/18 collared
- 4 Mar/18 seen in group of 3
- Died 21 Aug/18 at 10 years
- 11 Sep/18 collar retrieved

Caribou #261 (GPS, Argos)

- 5 Feb/18 collared
- 6 Mar/18 seen in group of 6 without calf
- 11 Mar/19 seen in group of 6 with calf

Caribou #260 (GPS, Iridium)

- 5 Feb/18 collared
- 6 Mar/18 seen in group of 7 without calf
- 11 Mar/19 seen in group of 5 without calf

Caribou #259 (GPS, Iridium)

- 5 Feb/18 collared
- 6 Mar/18 seen in group of 4 without calf
- 11 Mar/19 seen in group of 5 without calf

Caribou #258 (GPS, Recon, male)

- 5 Feb/18 collared
- 6 Mar/18 seen in group of 2
- 11 Mar/19 seen with another bull

Caribou #257 (GPS, Iridium)

- 8 Feb/17 collared
- 27 Feb/17 seen in group of 2 with calf
- 4 Mar/18 seen in group of 6 without calf

- 10 Mar/19 seen in group of 2 without calf

Caribou #256 (GPS, Recon, male, unknown)

- 8 Feb/17 collared
- 27 Feb/17 seen in group of 4
- No location since 19 Nov/17

Caribou #255 (GPS, Iridium)

- 7 Feb/17 collared
- 27 Feb/17 seen in group of 5 without calf
- 4 Mar/18 seen in group of 8 with calf
- 10 Mar/19 seen in group of 6 with calf

Caribou #254 (GPS, Recon, male, broke)

- 7 Feb/17 collared
- 27 Feb/17 seen in group of 7
- 21 Dec/17 collar broke off animal
- 1 Aug/18 collar retrieved

Caribou #253 (GPS, Iridium)

- 7 Feb/17 collared
- 27 Feb/17 seen in group of 7 without calf
- 4 Mar/18 seen in group of 5 without calf
- 10 Mar/19 seen in group of 7 with #268 with calf

Caribou #252 (GPS, Iridium)

- 7 Feb/17 collared
- 27 Feb/17 seen in group of 8 with calf
- 5 Mar/18 seen in group of 4 without calf
- 12 Mar/19 seen in group of 8 with calf

Caribou #251 (GPS, Recon, male, broke)

- 7 Feb/17 collared
- 27 Feb/17 seen in group of 3
- 5 Mar/18 seen in group of 6
- 1 Oct/18 collar broke off animal
- 1 Nov/18 collar retrieved

Caribou #250 (GPS, Recon, male, died)

- 7 Feb/17 collared
- 1 Mar/17 seen in group of 3
- Died 23 Apr/17
- 11 May/17 collared retrieved

Caribou #249 (GPS, Iridium)

- 7 Feb/17 collared
- 1 Mar/17 tried locating caribou, no luck, thought it was a mortality, but movement proved otherwise
- 6 Mar/18 seen in group of 3 without calf
- 11 Mar/19 seen in group of 4 without calf

Caribou #248 (GPS, Iridium, unknown)

- 6 Feb/17 collared
- 26 Feb/17 seen in group of 10 without calf
- No satellite locations since 26 Jul/17
- 5 Mar/18 seen in group of 7 with #216 without calf

Caribou #247 (GPS, Iridium, died)

- 6 Feb/17 collared
- 28 Feb/17 seen in group of 3 without calf
- Died 23 Dec/17 at 14 years
- 1 Aug/18 collar retrieved

Caribou #246 (GPS, Iridium)

- 6 Feb/17 collared
- 28 Feb/17 seen in group of 8 without calf
- 6 Mar/18 seen in group of 5 without calf
- 11 Mar/19 seen in group of 5 with calf

Caribou #245 (GPS, Recon, male, released)

- 6 Feb/17 collared
- 28 Feb/17 seen in group of 3
- 6 Mar/18 seen in group of 2
- 27 Jan/19 collar stationary died or broken is unknown

Caribou #244 (GPS, died)

- 15 Feb/16 collared
- 29 Feb/16 seen in group of 7 with calf
- Died 16 Oct/16 at 13 years
- 1 Aug/18 collar retrieved

Caribou #243 (GPS, Iridium)

- 15 Feb/16 collared
- 29 Feb/16 seen in group of 2 with calf
- 27 Feb/17 seen in group of 10 with calf
- 4 Mar/18 seen in group of 4 without calf

Caribou #242 (GPS, Iridium)

- 15 Feb/16 collared
- 29 Feb/16 seen in group of 3 with calf
- 27 Feb/17 seen in group of 2 without calf
- 4 Mar/18 seen in group of 2 without calf
- Missed in 2019 survey

Caribou #241 (GPS, Iridium)

- 9 Feb/16 collared
- 1 Mar/16 seen in group of 12 with calf

- 26 Feb/17 seen in group of 7 without calf
- 5 Mar/18 seen in group of 3 without calf
- 12 Mar/19 seen in group of 6 without calf

Caribou #240 (GPS)

- 9 Feb/16 collared
- 1 Mar/16 seen in group of 11 with calf
- 27 Feb/17 seen in group of 6 with calf
- 5 Mar/18 seen in group of 3 with calf
- Could not locate in 2019 survey

Caribou #239 (GPS-PLUS 2)

- 9 Feb/16 collared
- 2 Mar/16 seen in group of 4 with #221 without calf
- 1 Mar/17 seen in group of 2 without calf
- 5 Mar/18 seen in group of 2 with calf
- 28 Jun/18 last satellite location

Caribou #238 (GPS, died)

- 8 Feb/16 collared
- 1 Mar/16 seen in group of 4 without calf
- Died 20 April/16
- 1 Aug/18 collar retrieved

Caribou #237 (GPS)

- 8 Feb/16 collared
- 1 Mar/16 seen in group of 9 with #212 without calf
- 28 Feb/17 seen in group of 7 without calf
- 6 Mar/18 seen in group of 5 without calf
- 11 Mar/19 seen alone

Caribou #236 (GPS)

- 8 Feb/16 collared
- 1 Mar/16 seen in group of 2 without calf
- 28 Feb/17 seen in group of 2 without calf
- 6 Mar/18 seen in group of 1 without calf
- 11 Mar/19 seen alone

Caribou #235 (GPS-PLUS 2, died)

- 20 Feb/15 collared
- 4 Mar/15 seen in group of 6 without calf
- Died 30 Jun/15 at age 8 years
- 18 Aug/15 collar retrieved, five wolves still at kill site

Caribou #234 (GPS, died)

- 20 Feb/15 collared
- 4 Mar/15 seen in group of 3 with calf
- Died 15 Jul/15 at age 7 years
- 18 Aug/15 collar retrieved

Caribou #233 (GPS-PLUS 2)

- 20 Feb/15 collared
- 3 Mar/15 seen in group of 8 with #218, #223 without calf
- 2 Mar/16 seen in group of 4 with calf
- Died 25 May/16

Caribou #232 (GPS)

- 19 Feb/15 collared
- 3 Mar/15 seen in group of 3 without calf
- 29 Feb/16 seen in group of 6 with calf
- 1 Mar/17 seen in group of 9 without calf
- 5 Mar/18 seen in group of 2 with calf
- 12 Mar/19 seen in group of 3 with calf

Caribou #231 (GPS, died)

- 19 Feb/15 collared
- 2 Mar/15 seen in group of 6 with calf
- 29 Feb/16 seen in group of 4 with calf
- 27 Feb/17 seen in group of 5 with calf
- 4 Mar/18 seen in group of 6 without calf
- Died 2 Jul/18
- 31 Jul/17 collar deemed not retrievable

Caribou #230 (GPS)

- 19 Feb/15 collared
- 2 Mar/15 seen in group of 13 without calf
- 29 Feb/16 seen in group of 4 without calf
- 27 Feb/17 seen in group of 14 without calf
- 4 Mar/18 seen in group of 9 with calf
- 10 Mar/19 seen in group of 6 with calf

Caribou #229 (GPS, died)

- 19 Feb/15 collared
- 2 Mar/15 seen in group of 10 without calf
- 29 Feb/16 seen in group of 7 without calf
- Died 16 Nov/16
- 1 Aug/18 collar retrieved

Caribou #228 (GPS)

- 19 Feb/15 collared
- 2 Mar/15 seen in group of 15 without calf
- 2 Mar/16 seen alone without calf
- 26 Feb/17 seen in group of 14 without calf
- 5 Mar/18 seen in group of 5 without calf

Caribou #227 (GPS, harvested)

- 18 Feb/15 collared
- 3 Mar/15 seen in group of 2 with calf
- 1 Mar/16 seen in group of 10 without calf
- Died 11 Apr/17, was harvested by TL harvester, shot with 5 other caribou; age 4 years.
- 13 Apr/17 collar retrieved

Caribou #226 (GPS)

- 18 Feb/15 collared
- 3 Mar/15 seen in group of 6 with calf
- 1 Mar/16 seen in group of 8 without calf
- Unable to locate during 2017 survey, no GPS locations
- Unable to locate during 2018 survey, no GPS locations
- 11 Mar/19 seen in group of 4 with #278 with calf

Caribou #225 (GPS, died)

- 18 Feb/15 collared
- 3 Mar/15 seen in group of 10 with calf
- 1 Mar/16 seen alone without calf
- Died 12 Jul/16
- 1 Aug/18 collar retrieved

Caribou #224 (GPS, died)

- 10 Feb/14 collared
- Unable to relocate 3 Mar/14, GPS didn't initialize properly during deployment
- Received transmissions in April
- Unable to relocate 3 Mar/15, no VHF signal at waypoint
- Died 31 May/15 at 15 years
- 21 Aug/15 collar retrieved

Caribou #223 (GPS, released)

- 10 Feb/14 collared
- 5 Mar/14 seen in group of 2 with #206 without calf

- 3 Mar/15 seen in group of 8 with #218, #233 without calf
- 2 Mar/16 seen in group of 4 without calf
- 27 Feb/17 seen in group of 4 without calf
- 5 Mar/18 seen in group of 4 with calf
- 15 Jun/18 collar released
- 31 Jul/18 collar retrieved

Caribou #222 (GPS, died)

- 8 Feb/14 collared
- 5 Mar/14 seen in group of 3 without calf
- 4 Mar/15 seen in group of 8 without calf
- 2 Mar/16 seen in group of 6 without calf
- Died 10 Apr/16

Caribou #221 (GPS, released)

- 8 Feb/14 collared
- 4 Mar/14 seen in group of 2 without calf
- 3 Mar/15 seen in group of 4 without calf
- 2 Mar/16 seen in group of 6 with #239 without calf
- 1 Mar/17 seen in group of 3 without calf
- 6 Mar/18 seen in group of 1 without calf
- 15 Jun/18 collar released
- 31 Jul/18 collar retrieved

Caribou #220 (GPS)

- 8 Feb/14 collared
- 3 Mar/14 seen in group of 3 without calf
- 2 Mar/15 seen in group of 7 with calf
- 29 Feb/16 seen in group of 3 without calf
- 27 Feb/17 seen in group of 9 with calf

- 4 Mar/18 seen in group of 12 with calf
- 15 Jun/18 scheduled release did not occur
- 3 Jan/19 last transmission
- Unable to locate during 2019 survey

Caribou #219 (GPS, died)

- 8 Feb/14 collared
- 3 Mar/14 seen in group of 5 without calf
- 2 Mar/15 seen in group of 5 with calf
- Died 28 Apr/15 at age 7 years
- 19 Aug/15 collar retrieved

Caribou #218 (GPS, released)

- 7 Feb/14 collared
- 5 Mar/14 seen in group of 5 without calf
- 3 Mar/15 seen in group of 8 with #223, #233 without calf
- 2 Mar/16 seen in group of 2 with calf
- 27 Feb/17 seen in group of 7 with calf
- 5 Mar/18 seen in group of 5 without calf
- 15 Jun/18 collar released
- 10 Sep/18 collar deemed unretrievable

Caribou #217 (GPS, released)

- 7 Feb/14 collared
- 3 Mar/14 seen in group of 4 without calf
- 2 Mar/15 seen in group of 8 without calf
- 29 Feb/16 seen alone without calf
- 1 Mar/17 seen in group of 4 without calf
- 4 Mar/18 seen in group of 14 with calf
- 15 Jun/18 collar released
- 1 Aug/18 collar retrieved

Caribou #216 (GPS, released)

- 6 Feb/14 collared
- 3 Mar/14 seen in group of 12 without calf
- 3 Mar/15 seen in group of 12 with calf
- 1 Mar/16 seen in group of 4 without calf
- 26 Feb/17 seen in group of 8 with calf
- 5 Mar/18 seen in group of 7 with #248 without calf
- 15 Jun/18 collar released
- 31 Jul/18 collar retrieved
- Additional 4 years of on board data acquired

Caribou #215 (GPS, died)

- 6 Feb/14 collared
- 4 Mar/14 seen in group of 9 with #204 without calf
- 3 Mar/15 seen in group of 3 with #204 without calf
- Died 21 May/15
- 9 Sep/15 collar retrieved

Caribou #214 (GPS, died)

- 6 Feb/14 collared
- 4 Mar/14 seen in group of 6 with #202 without calf
- 3 Mar/15 seen in group of 3 without calf
- 1 Mar/16 seen in group of 2 without calf
- Died 29 Apr/16
- 1 Aug/18 collar retrieved

Caribou #213 (GPS, unknown)

- 6 Feb/14 collared
- 4 Mar/14 seen in group of 3 without calf
- 3 Mar/15 seen in group of 10 with #212 without calf
- 1 Mar/16 seen in group of 4 without calf
- 28 Feb/17 seen in group of 5 with calf

- No locations since 19 Oct/17

Caribou #212 (GPS, released)

- 27 Feb/13 collared
- 5 Mar/13 seen in group of 7 with calf
- 4 Mar/14 seen in group of 5 without calf
- 3 Mar/15 seen in group of 10 with #213 without calf
- 1 Mar/16 seen in group of 9 with #237 with calf
- 28 Feb/17 seen in group of 4 with calf
- 15 Jun/17 collar released

Caribou #211 (Sat, died)

- 14 Feb/13 collared
- 6 Mar/13 seen in group of 5 with calf
- 5 Mar/14 seen in group of 6 without calf
- 4 Mar/15 seen in group of 12 without calf
- Died 18 Aug/15

Caribou #210 (GPS, died)

- 12 Feb/13 collared
- 4 Mar/13 seen in group of 16 without calf
- 3 Mar/14 seen alone without calf
- 2 Mar/15 seen alone without calf
- Died 27 Jun/15

Caribou #209 (GPS-PLUS 2, died)

- 12 Feb/13 collared
- 4 Mar/13 seen in group of 6 with #196 without calf
- 3 Mar/14 seen in group of 2 with calf
- 4 Mar/15 seen in group of 23 without calf
- 29 Feb/16 seen in group of 3 without calf
- Died 7 Oct/16 at age 10 years

Caribou #208 (GPS, died, non-predation)

- 12 Feb/13 collared
- 5 Mar/13 seen in group of 8 without calf
- Died 30 Jun/13 at age 12 years, death related to malnutrition
- 11 Sep/13 collar retrieved

Caribou #207 (GPS, died)

- 12 Feb/13 collared
- 4 Mar/13 seen alone without calf
- Died 15 Nov/13

Caribou #206 (GPS, died)

- 12 Feb/13 collared
- 5 Mar/13 seen in group of 4 without calf
- 5 Mar/14 seen in group of 2 with #223 without calf
- 3 Mar/15 seen in group of 2 with calf
- Died 17 Jul/15 at age 22 years
- 18 Aug/15 collar retrieved
- Oldest caribou aged out of over 42,000 aged by Matson's Lab

Caribou #205 (GPS, died, non-predation)

- 11 Feb/13 collared
- 5 Mar/13 seen in group of 5 without calf
- Died 30 Jun/13 at age 14 years
- 9 Oct/14 collar retrieval

Caribou #204 (GPS, released)

- 11 Feb/13 collared
- 5 Mar/13 seen in group of 10 with #169, #170 with calf
- 4 Mar/14 seen in group of 9 with #215 with calf
- 3 Mar/15 seen in group of 3 with #215 with calf
- 1 Mar/16 seen in group of 6 with calf
- 28 Feb/17 seen in group of 5 without calf

- 15 Jun/17 collar released

Caribou #203 (GPS, released)

- 11 Feb/13 collared
- 5 Mar/13 seen in group of 7 without calf
- 4 Mar/14 seen in group of 7 with calf
- 3 Mar/15 seen in group of 3 with calf
- 1 Mar/16 seen in group of 2 without calf
- 28 Feb/17 seen in group of 6 with calf
- 15 Jun/17 collar released

Caribou #202 (GPS, no visual, released)

- 14 Mar/12 collared
- Did not relocate in 2012, was collared after survey
- 5 Mar/13 seen in group of 6 without calf
- 4 Mar/14 seen in group of 6 with #214 without calf
- Unable to relocate 3 Mar/15, waypoint was older, no VHF signal
- 1 Jul/16 collar released

Caribou #201 (GPS, no visual, released)

- 14 Mar/12 collared
- Did not relocate in 2012, was collared after survey
- 5 Mar/13 seen in group of 11 without calf
- 4 Mar/14 seen in group of 6 with calf
- Unable to relocate 3 Mar/15, no GPS locations during survey
- GPS locations restart in April
- 1 Jul/16 collar released

Caribou #200 (GPS, died)

- 17 Feb/12 collared
- 2 Mar/12 seen with #199 but

- without calf
- 5 Mar/13 seen in group of 4 with calf
- 4 Mar/14 seen alone without calf
- 3 Mar/15 seen in group of 2 with calf
- Died 17 Mar/15

Caribou #199 (Sat, no visual, released)

- 17 Feb/12 collared
- 2 Mar/12 seen with #200 but without calf
- 5 Mar/13 seen in group of 13 without calf
- 4 Mar/14 seen in group of 4 without calf
- 3 Mar/15 seen in group of 5 without calf
- Unable to relocate 2 Mar/16, no GPS locations during survey
- 15 Jun/16 collar released

Caribou #198 (GPS, died)

- 17 Feb/12 collared
- 2 Mar/12 seen in group of 4 without calf
- 5 Mar/13 seen in group of 13 with calf
- Died 14 July/13 at age 12 years
- 21 Oct/13 collar retrieved

Caribou #197 (GPS, died)

- 17 Feb/12 collared
- 1 Mar/12 seen in group of 6 without calf
- 5 Mar/13 seen in group of 2 with calf
- 4 Mar/14 seen alone without calf
- 3 Mar/15 seen alone without calf
- Died 9 Sep/15

Caribou #196 (GPS, released)

- 16 Feb/12 collared
- 29 Feb/12 seen in group of 4 with calf

- 4 Mar/13 seen in group of 6 with #209 without calf
- 3 Mar/14 seen in group of 2 with calf
- 2 Mar/15 seen in group of 7 with calf
- 29 Feb/16 seen in group of 4 without calf
- 1 Jul/16 collar released

Caribou #195 (GPS, unknown status, released)

- 16 Feb/12 collared
- 29 Feb/12 seen in group of 7 without calf
- 4 Mar/13 seen in group of 4 without calf
- 3 Mar/14 seen in group of 8 without calf
- No GPS locations last 6 months
- 1 Jul/16 collar released
- 11 Sep/18 collar was deemed unretrievable

Caribou #194 (Sat, died)

- 16 Feb/12 collared
- 29 Feb/12 seen in group of 4 without calf
- 4 Mar/13 seen in group of 3 without calf
- Died 20-22 Dec/13

Caribou #193 (GPS, released)

- 16 Feb/12 collared
- 29 Feb/12 seen in group of 7 with calf
- 4 Mar/13 seen in group of 4 without calf
- 3 Mar/14 seen in group of 5 without calf
- 2 Mar/15 seen in group of 5 with calf
- 29 Feb/16 seen in group of 3 without calf
- 1 Jul/16 collar released

Caribou #192 (GPS, died)

- 16 Feb/12 collared
- 29 Feb/12 seen alone
- 4 Mar/13 seen in group of 5 without calf
- Died 11 Jan/14
- 14 Jan/14 collar retrieved by trapper

Caribou #191 (GPS, released)

- 15 Feb/12 collared
- 29 Feb/12 seen in group of 4 with calf
- 4 Mar/13 seen in group of 5 without calf
- 3 Mar/14 seen in group of 7 without calf
- 2 Mar/15 seen in group of 19 without calf
- 29 Feb/16 seen in group of 4 without calf
- 1 Jul/16 collar released

Caribou #190 (GPS, died)

- 15 Feb/12 collared
- 29 Feb/12 seen in group of 3 with calf
- Died 25 Mar/12 at age 11 years
- 19 Jun/13 collar retrieved

Caribou #189 (GPS, VHF only, released)

- 15 Feb/12 collared
- 1 Mar/12 could not relocate in area
- 15 Mar/12 relocated in fixed-wing weak VHF signal
- 21 Jun/12 no satellite location
- 1 Jul/16 collar released
- 10 Sep/18 collar was deemed unretrievable

Caribou #188 (GPS, died, non-predation)

- 15 Feb/12 collared
- 1 Mar/12 seen in group of 3 without calf

- 6 Mar/13 seen in group of 3 with #151.790 without calf
- Died 27 Jun/13 at age 13 years, death related to malnutrition
- 11 Sep/13 collar retrieved

Caribou #187 (GPS, died)

- 15 Feb/12 collared
- 1 Mar/12 seen in group of 4 without calf
- 6 Mar/13 seen in group of 4 with #151.980 without calf
- Died 10 Jul/13

Caribou #186 (GPS, released)

- 27 Feb/10 collared
- 2 Mar/10 seen with calf
- 2 Mar/11 seen in group of 5 with calf
- 2 Mar/12 seen in group of 4 with calf
- 5 Mar/13 seen in group of 13 without calf
- 15 Jun/13 released
- 11 Sep/13 collar retrieved

Caribou #185 (GPS, died)

- 27 Feb/10 collared
- 2 Mar/10 seen alone, collar is resetting
- 3 Aug/10 located, no visual
- 2 Mar/11 seen in group of 4 with calf
- Died 22 Apr/11
- 24 Aug/12 unsuccessful retrieval attempt
- 11 Sep/13 collar retrieved

Caribou #184 (GPS, released)

- 26 Feb/10 collared
- 1 Mar/10 seen in group of 6 with calf
- 1 Mar/11 seen in group of 7 with calf
- 1 Mar/12 seen in group of 4 with calf

- 4 Mar/13 seen in group of 4 without calf
- 15 Jun/13 released

Caribou #183 (Sat)

- 26 Feb/10 collared
- 1 Mar/10 seen in group of 6 without calf
- 1 Mar/11 seen in group of 13 without calf
- 29 Feb/12 seen in group of 2 without calf
- 4 Mar/13 seen in group of 5 without calf
- 3 Mar/14 seen alone without calf
- 3 Mar/15 seen in group of 9 without calf
- 15 Jun/15 released

Caribou #182 (GPS, died)

- 26 Feb/10 collared
- 1 Mar/10 seen with cow
- 1 Mar/11 seen in group of 7 with calf
- 1 Mar/12 seen in group of 3 with calf
- Died 5 Aug/12 at age 4 years
- 2 Oct/12 collar retrieved

Caribou #181 (Sat, died)

- 26 Feb/10 collared
- 1 Mar/10 seen in group of 3 without calf
- 1 Mar/11 seen in group of 4 with calf
- Died 25 Apr/11

Caribou #180 (Sat, died)

- 26 Feb/10 collared
- 1 Mar/10 seen in group of 8 with calf
- 1 Mar/11 seen in group of 5 with calf
- 29 Feb/12 seen in group of 3 without calf
- Died 12 Jul/12

Caribou #179 (GPS, died)

- 25 Feb/10 collared
- 2 Mar/10 seen in group of 11 with calf
- Died 25 Nov/10
- 22 Feb/11 collar retrieved on Trout Lake

Caribou #178 (Sat, died)

- 25 Feb/10 collared
- 1 Mar/10 seen in group of 3 with calf
- Died 8 Oct/10
- 1 Mar/11 no signal at location

Caribou #177 (GPS, released)

- 25 Feb/10 collared
- 2 Mar/10 seen alone
- 25 Feb/11 seen with calf
- 1 Mar/12 seen in group of 9 without calf
- 6 Mar/13 seen in group of 2 with calf
- 15 Jun/13 released
- 11 Sep/13 collar retrieved

Caribou #176 (Sat, died)

- 25 Feb/10 collared
- 2 Mar/10 seen in group of 3 without calf
- 25 Feb/11 seen in group of 7 without calf
- 1 Mar/12 seen with calf
- Died 13 Aug/12 at age 10 years
- 2 Oct/12 collar retrieved

Caribou #175 (Sat, died)

- 25 Feb/10 collared
- 2 Mar/10 seen in group of 5 without calf
- Died 6 Sep/10
- 23 Nov/10 no caribou at signal location - inaccessible

Caribou #174 (GPS, released)

- 24 Feb/10 collared
- 1 Mar/10 seen with cow

- 1 Mar/11 seen in group of 5 with calf
- 29 Feb/12 seen in group of 8 with calf
- 4 Mar/13 seen in group of 11 without calf
- 15 Jun/13 released
- 11 Sep/13 collar retrieved

Caribou #173 (GPS, died)

- 24 Feb/10 collared
- 1 Mar/10 seen in group of 8 with calf
- 1 Mar/11 seen in group of 5 without calf
- Died 16 Apr/11 at age 9 years
- 24 Apr/12 collar retrieved

Caribou #172 (Sat)

- 24 Feb/10 collared
- 1 Mar/10 seen with calf
- 1 Mar/11 seen in group of 3 with calf
- 29 Feb/12 seen in group of 4 without calf
- 4 Mar/13 seen in group of 15 without calf
- 3 Mar/14 seen in group of 2 without calf
- 2 Mar/15 seen in group of 5 with calf
- 15 Jun/15 released

Caribou #171 (Sat)

- 24 Feb/10 collared
- 1 Mar/10 seen in group of 13 with #160 with calf
- 1 Mar/11 seen in group of 7 with calf
- 29 Feb/12 seen in group of 5 with calf
- 4 Mar/13 seen in group of 3 with calf
- 3 Mar/14 seen in group of 4 without calf
- 2 Mar/15 seen in group of 5 with calf

- 15 Jun/15 released

Caribou #170 (Sat, died)

- 23 Feb/10 collared
- 2 Mar/10 seen in group of 7 with #137 with calf
- 2 Mar/11 seen in group of 7 without calf
- 2 Mar/12 seen in group of 4 with #169 but without calf
- 5 Mar/13 seen in group of 10 with #169, #204 with calf
- 5 Mar/13 seen in group of 10 with #169, #204 with calf
- Died 29-31 Oct/13

Caribou #169 (GPS, released)

- 23 Feb/10 collared
- 2 Mar/10 seen alone
- 2 Mar/11 seen with calf
- 2 Mar/12 seen in group of 4 with #170 but without calf
- 5 Mar/13 seen in group of 10 with #170, #204 with calf
- 15 Jun/13 released

Caribou #168 (GPS, released)

- 19 Feb/09 collared
- 2 Mar/09 seen in group of 5 without calf
- 1 Mar/10 seen in group of 4 with calf
- 1 Mar/11 seen in group of 9 with calf
- 1 Jan/12 ceased satellite transmissions
- 29 Feb/12 seen in group of 4 with calf
- 10 Jun/12 released

Caribou #167 (GPS, died)

- 18 Feb/09 collared
- 3 Mar/09 seen in group of 7 without calf
- Died 22 Mar/09
- 5 Jun/09 collar retrieved

Caribou #166 (GPS, died)

- 19 Feb/09 collared
- 2 Mar/09 seen in group of 10 with #155 but without calf
- 1 Mar/10 seen in group of 4 without calf
- 1 Mar/11 seen alone
- Died 30 Oct/11

Caribou #165 (GPS, released)

- 19 Feb/09 collared with calf
- 2 Mar/09 seen in group of 14 with calf
- 1 Mar/10 seen in group of 10 with calf
- 1 Mar/11 seen in group of 9 with calf
- 29 Feb/12 seen with calf
- 10 Jun/12 released

Caribou #164 (GPS, released)

- 18 Feb/09 collared
- 3 Mar/09 seen in group of 4 without calf
- 2 Mar/10 seen in group of 3 without calf
- 2 Mar/11 seen with calf
- 2 Mar/12 seen in group of 6 without calf
- 10 June/12 released

Caribou #163 (GPS, died)

- 19 Feb/09 collared
- 3 Mar/09 seen in group of 9 without calf
- 1 Mar/10 seen with calf
- Died 15 April/10
- 14 Jun/10 signal from under ice on Liard River
- 3 Aug/10 collar unfrozen, ice has melted
- 5 Aug/10 collar retrieved

Caribou #162 (GPS, harvested)

- 19 Feb/09 collared
- 2 Mar/09 seen in group of 11 without calf

- 3 May/09 shot by harvester
- 24 May/09 collar retrieved

Caribou #161 (Sat, released)

- 18 Feb/09 collared
- 2 Mar/09 seen in group of 5 without calf
- 2 Mar/10 seen with cow
- 12 Nov/10 satellite transmission ceased
- 2 Jun/11 released

Caribou #160 (Sat, released)

- 17 Feb/08 collared with calf
- 3 Mar/08 seen in group of 5 with calf
- 28 May/08 no visual
- 2 Mar/09 seen in group of 14 without calf
- 1 Mar/10 seen in group of 13 with #171 and with calf
- 1 Mar/11 seen alone
- 29 Feb/12 seen in group of 6 with calf
- 4 Mar/13 seen in group of 4 without calf
- 7 Mar/13 released

Caribou #159 (Sat, released)

- 16 Feb/08 collared
- 4 Mar/08 seen in group of 24 without calf
- 21 Apr/08 located with 134
- 28 May/08 seen without calf
- 3 Mar/09 seen in group of 8 without calf
- 1 Mar/10 seen in group of 10 without calf
- 2 Mar/11 seen in group of 16 with #134 but without calf
- 2 Mar/12 seen in group of 7 without calf
- 5 Mar/13 seen in group of 8 with calf
- 7 Mar/13 released

Caribou #158 (Sat, died)

- 17 Feb/08 collared
- 3 Mar/08 seen with cow
- 28 May/08 seen with calf
- 2 Mar/09 seen in group of 6 with calf
- Died 2 June/09, couldn't find death date, was underwater
- 2 Jun/09 collar retrieved

Caribou #157 (Sat, released)

- 17 Feb/08 collared
- 3 Mar/08 seen in group of 5 without calf
- 23 May/08 lost satellite signal
- 29 May/08 seen in group of 3 with calf
- 2 Mar/09 seen in group of 5 with calf
- 1 Mar/10 seen in group of 5 without calf
- 30 Sep/10 collar released

Caribou #156 (GPS, died)

- 18 Feb/08 collared with calf
- 4 Mar/08 seen in group of 4 with calf
- 29 May/08 seen without calf
- 3 Mar/09 seen in group of 14 with calf
- Died 14 Apr/09
- 13 Jul/09 collar retrieved

Caribou #155 (GPS, harvested)

- 17 Feb/08 collared
- 3 Mar/08 seen in group of 6 without calf
- 28 May/08 seen with calf
- 2 Mar/09 seen in group of 10 with #166 but without calf
- Died 29 Jul/09 shot by harvester
- 21 Sep/09 collar retrieved

Caribou #154 (GPS, released)

- 17 Feb/08 collared
- 5 Mar/08 seen in group of 19 without calf

- 29 May/08 seen with calf
- 4 Mar/09 seen in group of 5 with calf
- 2 Mar/10 seen in group of 7 with calf
- 2 Mar/11 seen with calf
- 1 Jul/11 collar released

Caribou #153 (GPS, released)

- 16 Feb/08 collared with calf
- 4 Mar/08 seen in group of 4 without calf
- 29 May/08 seen without calf
- 2 Mar/09 seen in group of 5 with calf
- 2 Mar/10 seen in group of 4 with calf
- 2 Mar/11 seen in group of 6 without calf
- 1 Jul/11 collar released

Caribou #152 (GPS, died)

- 23 Jan/07 collared
- 27 Feb/07 seen in group of 6 without calf
- 30 May/07 seen with calf
- 4 Mar/08 seen with cow
- 30 May/08 seen with calf
- 3 Mar/09 seen in group of 10 without calf
- 2 Mar/10 seen in group of 9 with calf
- Died 25 Mar/10
- 21 May/10 tried to relocate by helicopter, too much water
- 22 Feb/11 ground relocation attempt but no signal
- 28 Aug/12 collar retrieved, VHF stopped working

Caribou #151 (GPS, harvested)

- 22 Jan/07 collared
- 26 Feb/07 seen in group of 6 without calf
- 29 May/07 seen with calf
- 3 Mar/08 seen in group of 8 without calf

- 28 May/08 seen with calf
- Died 9 Aug/08 by Fish Lake likely shot by harvester
- 2 Jun/09 collar retrieved

Caribou #150 (GPS, harvested)

- 22 Jan/07 collared
- 26 Feb/07 seen in group of 2 without calf
- 29 May/07 seen with calf
- 3 Mar/08 seen with cow
- Died 15 May/08 likely shot by harvester
- 17 Jun/08 collar retrieved

Caribou #149 (GPS, released)

- 24 Feb/07 collared
- 27 Feb/07 seen in group of 7 without calf
- 30 May/07 seen with calf
- 4 Mar/08 seen in group of 10 without calf
- 29 May/08 seen with calf
- 3 Mar/09 seen in group of 9 with calf
- 3 Mar/10 seen in group of 12 without calf
- 2 Jun/10 collar released
- 8 Oct/10 collar retrieved

Caribou #148 (Sat, released)

- 24 Jan/07 collared
- 26 Feb/07 seen in group of 12 without calf
- 30 May/07 seen without calf
- 4 Mar/08 seen with calf
- 29 May/08 seen with calf
- 2 Mar/09 seen in group of 3 without calf
- 30 Sep/09 collar released
- 2 Mar/10 collar located from air in inaccessible area

Caribou #147 (Sat, died)

- 22 Jan/07 collared
- 26 Feb/07 seen in group of 8 without calf

- 30 May/07 seen without calf
- 3 Mar/08 seen in group of 9 without calf
- 28 May/08 seen with calf
- Died 17 Jul/08
- 17 Aug/09 collar retrieved

Caribou #146 (Sat, released)

- 21 Jan/07 collared
- 27 Feb/07 see in group of 11 with calf
- 30 May/07 seen with calf
- 4 Mar/08 seen in group of 4 with calf
- 29 May/08 seen without calf
- 2 Jul/08 lost satellite signal
- 3 Mar/09 seen in group of 3 with #108 but without calf
- 2 Mar/10 seen in group of 4 with calf
- 30 Sep/10 collar released

Caribou #145 (Sat, released)

- 21 Jan/07 collared
- 27 Feb/07 seen in group of 3 without calf
- 30 May/07 seen without calf
- 3 Mar/08 seen in group of 4 with calf
- 29 May/08 seen with calf
- 2 Jul/08 lost satellite signal
- 2 Mar/09 seen in group of 5 with calf
- 1 Mar/10 seen in group of 4 with calf
- 30 Sep/10 collar released

Caribou #144 (Sat, harvested)

- 23 Jan/07 collared
- 26 Feb/07 seen in group of 10 without calf
- Died 4 Apr/07 shot by harvester
- 12 Apr/07 collar retrieved

Caribou #143 (Sat, released)

- 21 Jan/07 collared
- 26 Feb/07 seen in group of 6 without calf
- 29 May/07 seen with calf
- 20 Nov/07 seen in group of 4
- 04 Sep/07 lost satellite transmission
- 4 Mar/08 seen in group of 6 without calf
- 26 Mar/08 located, no visual
- 21 Apr/08 located, no visual
- 29 May/08 not located, no signal
- 3 Mar/09 seen in group of 2 without calf
- 14 May/09 located, no visual
- 1 Jun/09 seen with calf
- 9 Jul/09 located, no visual
- 12 Aug/09 located, no visual
- 2 Sept/09 located, no visual
- 28 Oct/09 located, no visual
- 22 Nov/09 located, no visual
- 22 Feb/10 located, no visual
- 2 Mar/10 seen in group of 4 without calf
- 3 Aug/10 located, no visual
- 30 Sep/10 collar released
- 23 Nov/10 no caribou at collar location
- 31 Jan/11 no caribou at signal location

Caribou #142 (Sat, unknown status)

- 22 Jan/07 collared
- 26 Feb/07 seen in group of 10 without calf
- 29 May/07 seen with calf
- 3 Mar/08 seen in group of 4 without calf
- Died before 9 May/08
- 28 May/08 no VHF signal from last known satellite location, collar likely underwater

Caribou #141 (Sat, died)

- 23 Jan/07 collared

- 26 Feb/07 seen in group of 2 without calf
- Died 16 Apr/07
- 13 Jul/07 collar retrieved

Caribou #140 (GPS, died)

- 24 Jan/07 collared
- 26 Feb/07 seen in group of 3 without calf
- 30 May/07 seen without calf
- Died 28 Oct/07 at age 5 years
- 25 Apr/08 collar retrieved

Caribou #139 (GPS, died)

- 21 Jan/07 collared
- 27 Feb/07 seen in group of 6 without calf
- 30 May/07 seen in group of 4 with calf
- 3 Mar/08 seen with calf
- 29 May/08 seen with calf
- 2 Mar/09 seen in group of 3 without calf
- Died 7 Jul/09 at age 9 years
- 10 Aug/09 collar retrieved

Caribou #138 (GPS, released)

- 23 Jan/07 collared
- 27 Feb/07 seen in group of 4 without calf
- 30 May/07 seen without calf
- 4 Mar/08 seen in group of 8 without calf
- 29 May/08 seen with calf
- 3 Mar/09 seen in group of 17 without calf
- 2 Mar/10 seen in group of 3 without calf
- 2 Jun/10 collar released

Caribou #137 (GPS, released)

- 23 Jan/07 collared
- 27 Feb/07 seen in group of 5 without calf
- 29 May/07 seen with calf
- 5 Mar/08 seen with calf

- 29 May/08 seen in group of 3 with calf
- 3 Mar/09 seen in group of 13 with calf
- 2 Mar/10 seen in group of 7 with #170 with calf
- 2 Jun/10 collar released
- 3 Aug/10 no caribou at signal location
- 23 Nov/10 no caribou at signal location

Caribou #136 (GPS, released)

- 23 Jan/07 collared
- 26 Feb/07 seen in group of 5 without calf
- 29 May/07 seen without calf
- 5 Mar/08 seen in group of 19 without calf
- 29 May/08 seen with calf
- 7 Mar/09 seen in group of 7 without calf
- 2 Mar/10 seen in group of 3 without calf
- 2 Jun/10 collar released
- 3 Aug/10 no caribou at signal location

Caribou #135 (VHF, died)

- 21 Jan/06 collared
- 1 Mar/06 seen in group of 4 without calf
- 30 May/06 without calf
- 28 Sep/06 no visual
- 23 Feb/07 seen in group of 6 without calf
- Died 23-28 May/07
- 31 May/07 collar retrieved

Caribou #134 (VHF, released)

- 21 Jan/06 collared
- 1 Mar/06 seen in group of 3
- 29 May/06 seen with calf
- 16 Sep/06 seen in group of 4
- 26 Feb/07 seen in group of 2 without calf
- 29 May/07 seen without calf

- 15 Feb/08 seen in group of 13 without calf
- 4 Mar/08 seen in group of 24 without calf
- 26 Mar/08 located, no visual
- 21 Apr/08 located with #159
- 28 May/08 seen with calf
- 3 Mar/09 seen in group of 9 with calf
- 14 May/09 located, no visual
- 1 Jun/09 seen with calf
- 9 Jul/09 located, no visual
- 12 Aug/09 located, no visual
- 2 Sep/09 located, no visual
- 28 Oct/09 located, no visual
- 22 Nov/09 located, no visual
- 22 Feb/10 located, no visual
- 1 Mar/10 seen in group of 3 with calf
- 14 Jun/10 located, no visual
- 3 Aug/10 located, no visual
- 23 Nov/10 located, no visual
- 31 Jan/11 located, no visual
- 1 Mar/11 seen in group of 16 including #159 and with calf
- 4 Jul/11 collar released

Caribou #133 (VHF, unknown status)

- 21 Jan/06 collared
- 1 Mar/06 seen with calf
- 30 May/06 seen with calf
- 23 Jan/07 seen in group of 10 without calf
- 26 Feb/07 seen in group of 3 without calf
- 29 May/07 seen with calf
- Unable to relocate since Dec/07
- 4 Jul/11 collar released

Caribou #132 (VHF, released)

- 22 Jan/06 collared
- 1 Mar/06 seen in group of 9 with calf
- 29 May/06 approx. location not pregnant
- 16 Sep/06 seen in group of 2 without calf

- 26 Feb/07 seen in group of 3 without calf
- 30 May/07 seen with calf
- 15 Feb/08 seen in group of 5 without calf
- 4 Mar/08 seen in group of 5 without calf
- 26 Mar/08 located, no visual
- 21 Apr/08 located, no visual
- 29 May/08 not located
- 1 Mar/09 collar released
- 2 Mar/09 located collar in mortality mode, no caribou at signal location

Caribou #131 (Sat, released)

- 22 Jan/06 collared
- 1 Mar/06 seen with calf
- 29 May/06 without calf
- 16 Sep/06 seen in group of 3 cows without calf
- 21 Jan/07 seen in group of 5 with calf
- 27 Feb/07 seen in group of 5 without calf
- 30 May/07 seen with calf
- 03 Mar/08 seen in group of 8 with calf
- 29 May/08 seen with calf
- 2 Mar/09 seen in group of 4 with calf
- 15 Apr/09 collar released

Caribou #130 (Sat, died, non-predation)

- 22 Jan/06 collared
- 1 Mar/06 seen in group of 7 without calf
- 29 May/06 without calf
- Died 5 Jul/06 at age 5 years, death related to malnutrition
- 23 Aug/06 collar retrieved

Caribou #129 (Sat, died)

- 20 Jan/06 collared
- 1 Mar/06 seen in group of 6 without calf

- 30 May/06 seen with calf
- 16 Sep/06 with calf
- 21 Jan/07 seen in group of 4 with calf
- 26 Feb/07 seen in group of 10 with calf
- 29 May/07 seen with calf
- 05 Mar/08 seen without calf
- Died 27 May/08 at age 5 years
- 29 May/08 collar retrieved

Caribou #128 (Sat, released)

- 20 Jan/06 collared
- 2 Mar/06 seen in group of 5 without calf
- 30 May/06 seen in group of 4 with calf
- 16 Sep/06 seen in group of 3 without calf
- 27 Feb/07 seen in group of 5 without calf
- 29 May/07 seen with calf
- 04 Mar/08 seen in group of 10 with calf
- 29 May/08 seen with calf
- 22 Oct/08 collar finished transmitting
- 3 Mar/09 seen in group of 3 with calf
- 2 Mar/10 seen in group of 7 without calf
- 3 Mar/10 collar released

Caribou #127 (Sat, died)

- 22 Jan/06 collared
- 1 Mar/06 seen in group of 7 with calf
- 29 May/06 seen with calf
- Died 21 Jul/06 at age 7 years
- 16 Sep/06 confirm wolf predation
- 23 Oct/06 collar retrieved

Caribou #126 (Sat, died)

- 21 Jan/06 collared
- 1 Mar/06 seen in group of 5 with yearling

- 30 May/06 seen with calf
- 26 Feb/07 seen in group of 13 without calf
- 29 May/07 seen without calf
- 03 Mar/08 seen in group of 14 without calf
- 28 May/08 seen with calf
- 2 Mar/09 seen in group of 5 without calf
- Died 28 Apr/09 at age 12 years
- 8 Jun/10 collar retrieved

Caribou #125 (Sat, died)

- 22 Jan/06 collared
- 1 Mar/06 seen in group of 16 with yearling
- 29 May/06 seen with small calf
- Died 12-15 Jul/06, likely wolf predation
- 23 Oct/06 collar retrieved

Caribou #124 (Sat, died)

- 20 Jan/06 collared
- 2 Mar/06 seen in group of 7 without calf
- Died 10 Apr/06, likely wolf predation
- 23 Aug/06 collar retrieved

Caribou #123 (Sat, died)

- 20 Jan/06 collared
- 2 Mar/06 seen in group of 4 with calf
- 29 May/06 without calf
- 16 Sep/06 seen in group of 3
- Died 5 Nov/06 on Trainor Lake
- 15 Feb/07 locate collar in ice
- 27 Feb/07 collar retrieved

Caribou # 122 (Sat, harvested)

- 4 Mar/05 collared
- 21 Mar/05 seen in group of 3
- 30 Mar/05 seen in group of 3
- 1 Jun/05 seen alone without calf
- 4 Jun/05 no visual
- 23 Sep/05 no visual
- 10 Oct/05 no visual

- 31 Nov/05 no satellite signal
- 4 Apr/05 got satellite signal back
- 30 May/05 seen without calf
- 24 Nov/06 no satellite signal
- 15 Jun/07 collar went off air finishing transmissions
- 14 Apr/14 caribou shot by harvester
- 15 Apr/11 collar handed in by harvester

Caribou #121 (Sat, died)

- 4 Mar/05 collared
- 21 Mar/05 seen in group of 3
- Died 26-27 Mar/05 at age 10 years predated by wolves
- 30 Mar/05 collar retrieved

Caribou #120 (Sat, released)

- 4 Mar/05 collared
- 21 Mar/05 seen in group of 13
- 30 Mar/05 seen in group of 3
- 1 Jun/05 no visual
- 4 Jun/05 seen alone without calf
- 23 Sep/05 seen in group of 14
- 10 Oct/05 no visual
- 16 Jan/06 seen in group of 3
- 1 Mar/06 seen in group of 5
- 30 May/06 without calf
- 26 Feb/07 seen in group of 10 without calf
- 30 May/07 seen without calf
- 7 Dec/07 seen in group of 4 without calf
- 3 Mar/08 seen in group of 4 without calf
- 28 May/08 seen with calf
- 7 Oct/08 transmissions from collar ceased
- 2 Mar/09 see in group of 6 without calf
- 3 Mar/09 collar released
- 29 Aug/09 collar retrieved

Caribou # 119 (Sat, released)

- 4 Mar/05 collared
- 21 Mar/05 seen in group of ≥ 8

- 30 Mar/05 no visual
- 1 Jun/05 seen alone without calf
- 23 Sep/05 no visual
- 10 Oct/05 no visual
- 16 Jan/06 in group of 5 without calf
- 1 Mar/06 in group of 4
- 30 May/06 with calf
- 22 Jan/07 in group of 3 with calf
- 26 Feb/07 in group of 11 with calf
- 29 May/07 seen without calf
- 3 Mar/08 seen with cow
- 28 May/08 seen with calf
- 10 Sep/08 satellite transmission ceased
- 2 Mar/09 seen in group of 5 without calf
- 3 Mar/09 collar released
- 2 Jun/09 collar retrieved

Caribou # 118 (Sat, died)

- 4 Mar/05 collared
- 21 Mar/05 seen in group of 10
- 30 Mar/05 seen in group of 9
- 1 Jun/05 no visual
- 4 Jun/05 no visual
- Died 13 Jun/05 at age 15 years, likely wolf predation
- 6 Sep/05 collar retrieved

Caribou #117 (Sat, died)

- 3 Mar/05 collared
- 31 May/05 seen alone without calf
- 10 Jun/05 seen in thick brush
- 23 Sep/05 seen in group of at least 4
- 26 Jan/06 seen in group of 4 with calf
- 2 Mar/06 seen in group of 5 with calf
- Died 18 Apr/06
- 23 Aug/06 collar retrieved

Caribou #116 (Sat, released)

- 3 Mar/05 collared

- 31 May/05 seen alone without calf
- 10 Jun/05 no visual
- 23 Sep/05 seen in group of 3
- 26 Jan/06 seen in group of 7 with calf
- 2 Mar/06 seen in group of 4 with calf
- 29 May/06 seen with calf
- 16 Sep/06 seen in group of 2 without calf
- 23 Jan/07 seen in group of 12 without calf
- 27 Feb/07 seen in group of 6 without calf
- 30 May/07 seen in group of 3 with calf
- 4 Mar/08 seen with bull
- 29 May/08 seen with calf
- 13 Oct/08 satellite transmission ceased
- 3 Mar/09 seen in group of 17 without calf
- 3 Mar/09 collar released
- 7 Jul/09 collar retrieved

Caribou #115 (Sat, released)

- 3 Mar/05 collared
- 10 Apr/05 seen in group of 3
- 31 May/05 seen alone without calf
- 23 Sep/05 no visual
- 5 Oct/05 seen in group of 2 without calf
- 2 Mar/06 seen in group of 9 without calf
- 30 May/06 seen in group of 2 without calf
- 16 Sep/06 seen in group of 4 without calf
- 27 Feb/07 seen in group of 4 without calf
- 29 May/07 seen with calf
- 04 Mar/08 seen with 2 cows
- 30 May/08 seen with calf
- 1 Oct/08 satellite transmissions ceased

- 4 Mar/09 seen in group of 3 with calf
- 3 Mar/09 collar released
- 10 Aug/09 collar retrieved

Caribou #114 (Sat, released)

- 3 Mar/05 collared
- 10 Apr/05 seen in group of 9
- 31 May/05 no visual
- 10 Jun/05 seen alone without calf
- 23 Sep/05 no visual
- 2 Mar/06 seen in group of 6 without calf
- 29 May/06 seen in group of 3 without calf
- 16 Sep/06 seen in group of 3 without calf
- 27 Feb/07 seen in group of 6 without calf
- 30 May/07 seen with without calf
- 4 Mar/08 seen in group of 7 without calf
- 29 May/08 seen with calf
- 3 Jul/09 satellite transmissions ceased
- 3 Mar/09 seen in group of 13 with calf
- 3 Mar/09 collar released
- 1 Jun/09 collar retrieved

Caribou #113 (Sat, died)

- 3 Mar/05 collared
- 10 Apr/05 seen in group of 4
- 31 May/05 no visual
- 10 Jun/05 seen alone without calf
- Died 10 Sep/05 likely wolf predation
- 5 Oct/05 collar retrieved

Caribou #112 (Sat, released)

- 3 Mar/05 collared
- 10 Apr/05 seen with calf
- 31 May/05 seen with calf
- 10 Jun/05 seen with calf

- 23 Sep/05 no visual
- 1 Mar/06 seen in group of 6 with calf
- 30 May/06 seen in group of 4 with calf
- 16 Sep/06 seen with calf
- 27 Feb/07 seen in group of 5 with calf
- 29 May/07 seen with calf
- 5 Mar/08 seen with 2 bulls
- 30 Jun/08 located, no visual
- 22 Oct/08 satellite transmission ceased
- 3 Mar/09 collar released
- 6 Jul/09 collar retrieved

Caribou #111 (Sat, released)

- 3 Mar/05 collared
- 5 May/05 seen in group of 2
- 31 May/05 seen with calf
- 23 Sep/05 seen in group of 5 with calf
- 1 Mar/06 seen in group of 9 without calf
- 29 May/06 seen with calf
- 16 Sep/06 seen in group of 3
- 24 Jan/07 seen in group of 14
- 27 Feb/07 seen in group of 4 with calf
- 30 May/07 seen with calf
- 4 Mar/08 seen in group of 8 with calf
- 28 May/08 seen with calf
- 11 Nov/08 satellite transmission ceased
- 3 Mar/09 seen in group of 11 with calf
- 3 Mar/09 collar released
- 10 Jul/09 collar retrieved

Caribou #110 (Sat, died)

- 5 Mar/05 collared
- 5 May/05 seen alone without calf
- 31 May/05 seen alone without calf
- Died 2 Jun/05 at 17 years, likely wolf predation

- 29 Jul/05 collar retrieved

Caribou #109 (Sat, died)

- 1 Apr/04 collared
- 29 May/04 no visual
- 22 Sep/04 seen in group of 4 without calf
- 31 May/05 seen with calf
- 19 Jun/05 seen with calf
- 23 Sep/05 no visual
- 5 Oct/05 seen in group of 3 with calf
- Died 22 Apr/06, likely wolf predation
- 23 Aug/06 collar retrieved

Caribou #108 (Sat, observed alive, no Sat or VHF active)

- 1 Apr/04 collared
- 29 May/04 seen alone without calf
- 3 Jun/04 no visual
- 22 Sep/04 seen in group of 3 without calf
- 25 Jan/05 seen in group of 4 without calf
- 31 May/05 no visual
- 10 Jun/05 no visual
- 19 Jun/05 seen with calf
- 23 Sep/05 no visual
- 5 Oct/05 seen in group of 5 with calf
- 2 Mar/06 seen in group of 3 with yearling
- 30 May/06 seen with calf
- 23 Jan/06 seen in group of 5 with calf
- 27 Feb/07 seen in group of 11 with calf
- 30 May/07 seen in group of 3 with calf
- 15 Jun/07 satellite transmissions ceased
- 3 Mar/09 seen in group of 3 with #146, no VHF transmissions

Caribou #107 (Sat, died)

- 1 Apr/04 collared
- 29 May/04 no visual
- 22 Sep/04 seen in group of 3 with calf
- Died 22 Apr/05 likely wolf predation
- 4 May/05 collar retrieved

Caribou #106 (Sat, died)

- 30 Mar/04 collared
- 29 May/04 no visual
- 3 Jun/04 seen in group of 2 with calf
- 22 Sep/04 seen in group of 7 without calf
- 25 Jan/05 seen in group of 5 without calf
- 31 May/05 seen alone without calf
- 23 Sep/05 seen in group of 2 without calf
- Died 12 Nov/05, likely wolf predation
- 30 May/06 collar retrieved

Caribou #105 (Sat, died)

- 30 Mar/04 collared
- 29 May seen in group of 3 with calf
- 22 Sep/04 no visual
- 25 Jan/05 seen in group of 3 without calf
- 31 May/05 seen alone without calf
- 19 Jun/05 seen alone without calf
- 23 Sep/05 no visual
- 2 Mar/06 seen in group of 11 without calf
- Died 13 May/06 at age 14 years, likely wolf predation
- 23 Aug/06 collar retrieved

Caribou #104 (Sat, died, non-predation)

- 29 Mar/04 collared
- 29 May/04 seen in group of 3 without calf
- 3 Jun/04 seen in group of 3 without calf
- 22 Sep/04 no visual
- Died 13 Apr/05 age 11 years, a death related to malnutrition
- 4 May/05 collar retrieved

- 30 Oct/06 problems with satellite transmission
- 6 Feb/06 no satellite/VHF signal
- 27 Feb/07 no visual
- 30 May/07 no visual
- 15 Jun/07 satellite transmission ceased

Caribou #103 (Sat, died)

- 1 Apr/04 collared
- 29 May/04 seen in group of 3 with calf
- 22 Sep/04 no visual
- Died 16 Apr/05 at age 5 years, likely wolf predation
- 4 May/05 collar retrieved

Caribou #102 (Sat, died)

- 29 Mar/04 collared
- Died 5 May/04, wolf predation
- 3 Jun/04 collar retrieved

Caribou # 101 (Sat, died)

- 30 Mar/04 collared
- Died 5 May/04 at age 14 years, likely wolf predation
- 9 Aug/04 collar retrieved

Caribou # 100 (Sat, no Sat or VHF active)

- 29 Mar/04 collared
- 29 May/04 seen in group of 3 without calf
- 3 Jun/04 seen alone without calf
- 22 Sep/04 no visual
- 25 Jan/05 seen in group of 11, without calf
- 31 May/05 seen in group of 3 with calf
- 19 Jun/05 seen alone without calf
- 23 Sep/05 problems with VHF transmission