

Tweedsmuir-Entiako Caribou Recruitment Survey: March 2018



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1.0 Introduction

This report summarizes the inventory results of an aerial survey conducted on March 25th 2018 for the Tweedsmuir – Entiako caribou herd. The survey was conducted using a Highland Helicopter Jet Ranger, based from Smithers, BC. The objective was to count and record the distribution of collared caribou, record the number of calves and, if possible, identify which collared caribou have calves for the Tweedsmuir-Entiako herd. Additionally, incidental observations of other wildlife species were recorded. A total of 115 caribou were tallied.

1.1 Background

Monitoring of the Tweedsmuir-Entiako caribou herd has occurred since the early 1980s, with the exception of monitoring gaps between 1988-1990, 2003-2005, and 2010-2011. An active monitoring program has been in place since the Chelaslie wildfire in 2014 and has included the collaring of 40 caribou and a total of 6 population surveys, 3 fall census surveys and 3 late winter recruitment surveys. Collars allow for the monitoring of adult female mortality, mortality investigations and health assessments, assessment of habitat selection strategies, and relocation of individuals for surveys. Population surveys (i.e. rut and spring recruitment surveys) provide a minimum count of the number of individuals in a population and indicate sex ratios which may inform population trends.

This report documents the results of the March 2018 recruitment survey for the Tweedsmuir-Entiako caribou herd, focussed on re-locating collared caribou, mainly in the Entiako, South Ootsa and Fawnie Mnt areas. The previous rut survey for this herd was conducted in October 2017 and yielded a minimum population count of 146 caribou. The previous recruitment survey in March 2017 yielded a calf recruitment of 6.5% calves (at total of 7 calves were observed). A total of 20 radio-collared caribou (20 GPS and 0 VHF) were relocated for to evaluate calf recruitment and a total of 115 caribou were counted. A total of 26 collars were searched for, 1 was on mortality from March 23, 1 VHF was not heard or located, and 4 GPS collars were not re-located and the GPS locations had stopped transmitting during the winter.

1.2 Study Area

The March recruitment survey was guided by GPS caribou collar locations downloaded immediately prior to the survey. Caribou that were observed incidentally were also surveyed, as well, the 1 VHF collared caribou that was last located in October 2017 was listened for. The March survey included several areas in the Chelaslie migration corridor areas north of Tetachuk Lake and near Chief Louis Lake, in the high elevation forest on the south slope of the Quanchus Range in Northern Tweedsmuir Park, as well as in Entiako Park and west and south of Entiako Park.

1.3 Objectives

- Count, classify (calf:adult), and record caribou groups and distribution;
- Obtain minimum total count of caribou population size;
- Count and record incidental species; and
- Estimate the calf recruitment.

2.0 Methods

2.1 Survey

Weather conditions were monitored prior to the survey to select a timing window that would ensure the appropriate snow cover, temperature, and flying conditions during the survey. The survey crew was based out of Smithers and utilized a Bell 206 Jet Ranger helicopter outfitted with telemetry gear for the survey. The crew consisted of a pilot, navigator/observer/telemetry (left front seat), and a data recorder/observer (rear right seat). Immediately prior to the survey the most recent GPS telemetry locations were downloaded for reference during the survey.

We navigated using iPads (Apple Inc.) and running PDF maps and GIS Kit. Real-time tracking of the survey lines was displayed for both the navigator and the pilot, greatly increasing the amount of time the navigator was able to allocate to searching for caribou versus navigating. Hand-held GPS units were used to record the flight path and locations of all animals sighted.

Caribou were classified as calf (males and females < 1 year old), and adult. If possible, gender was identified for adults (females >1 year old and males >1 year old), however this was not focussed on due to challenges with sightability in forested low elevation winter range. Females were identified by the presence of a black vulval patch, and males by the absence of a patch or, in some cases, the presence of large antlers. Incidental species (moose and wolves) were recorded, but not classified by sex or age.

Table 1. Caribou collars in the Tweedsmuir-Entiako caribou herd area, March 2018.

Animal ID	Gender	Status	Collar Frequency	Collar SN	Comment
TWC1003	female	alive	148.280	16266	Yes with calf
TWC1009	female	alive	149.730	21511	Yes with calf
TWC1012	male	alive	148.390	16277	N/A (male)
TWC1014	female	alive	148.470	16284	4 collars in this group; 2 had calves with them
TWC1015	female	alive	148.400	16278	4 collars in this group; 2 had calves with them
TWC1016	female	alive	148.480	16285	No
TWC1017	female	alive	148.370	16275	Did not hear or locate (GPS fail and VHF not heard)
TWC1028	female	alive	148.300	16268	Yes
TWC1029	female	alive	148.340	16272	2 collared caribou in this group; 1 had calf with
TWC1031	female	alive	149.710	21510	No calf
TWC1032	female	alive	148.920	21524	Did not hear or locate (GPS fail and VHF not heard)
TWC1033	female	alive	148.850	21518	No calf
TWC1034	female	alive	149.860	21519	No calf
TWC1035	female	alive	149.880	21521	4 collars in this group; 2 had calves with them
TWC1036	female	alive	149.820	21517	No calf
TWC1037	female	alive	149.940	21526	No calf
TWC1038	female	alive	149.870	21520	Yes with calf
TWC1042	female	alive	149.930	21525	No calf
TWC1043	female	alive	149.810	21516	Yes with calf
TWC1045	male	alive	149.800	21515	No. Mortality
TWC1046	female	alive	149.750	21512	2 collared caribou in this group; 1 had calf with

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TWC1049	female	Alive	149.700	21509	4 collars in this group; 2 had calves with them
TWC1050	female	alive	149.790	21514	No calf
TWC1051	female	alive	149.780	21513	No calf
TWC1007	female	Unk. Fate	148.380	16276	Not transmitting; did not hear
n/a	female	Alive	148.220	VHF	Did not hear or locate

2.2 Data summary

Survey data was entered into standard WSI spreadsheets. Track lines were saved as shape files.

3.0 Results

3.1 Survey

Weather conditions during the survey were considered good until the late afternoon when the wind increased. Temperature was -8 °C with a high overcast ceiling of 60% variable cloud cover. Winds were calm, with a light breeze in the morning (up to 5 miles/hr) and by the mid-afternoon, with gusts of up to 10-15 miles/hr. Visibility was considered good throughout the day. There was an estimated 2 days since the last snowfall and snow cover was estimated at 100% cover and minimum of 50cm snow across the survey area. Tracks were considered highly visible and helped re-locate animals.

On March 25th, 2018, after ferrying to the survey area in North Tweedsmuir Park, we used recent GPS locations and telemetry to locate collared caribou, count animals and calves, and identify if collared females were with calves (Figure 1). It is difficult to confidently classify caribou through low elevation winter range forest, therefore bull:cow and calf:cow ratios are not calculated from this survey. The calf:adult ratio can be assessed. A total of 115 caribou were counted in all groups (Table 2).

Table 2. Caribou counted during the March 25th, 2018 survey.

Location	Total	Adults	Calves	Number of Groups
Quanchus Range (HEWR)	9	6	3	1
Chelaslie (LEWR/HEWR)	46	36	9	6
Entiako (LEWR/HEWR)	61	45	16	7
Total Survey	115	87	28	14

Of the total 115 caribou tallied, 87 were adults (75.7%), 28 calves (24.3%) with a ratio of 24 calves/100 adults.

Two of the 14 caribou groups were located randomly during the survey, without the aid of radio-collared caribou to locate these groups. Of the 14 groups that were located, group size ranged from 2 – 21.

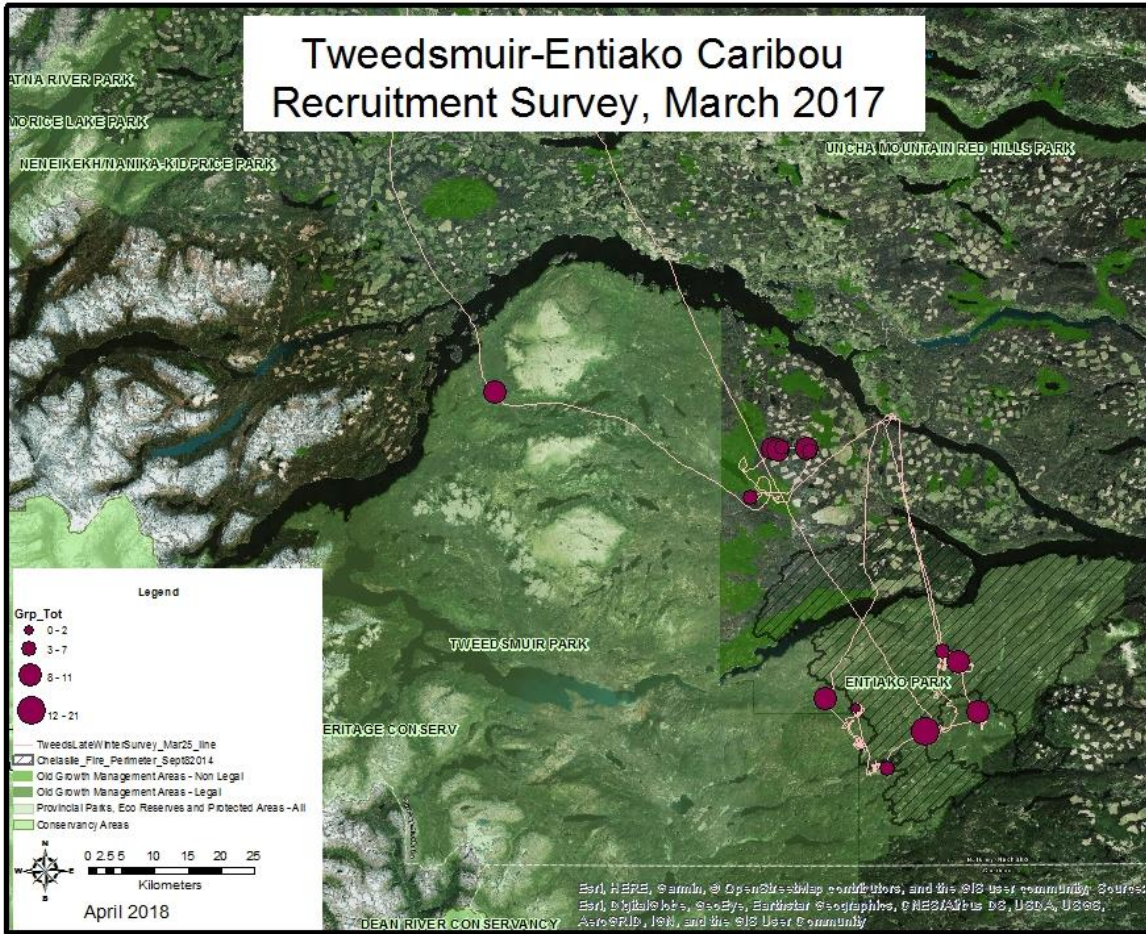


Figure 1. The Tweedsmuir – Entiaiko caribou recruitment area, flight lines, caribou group locations and incidental observations, March 25th, 2018.

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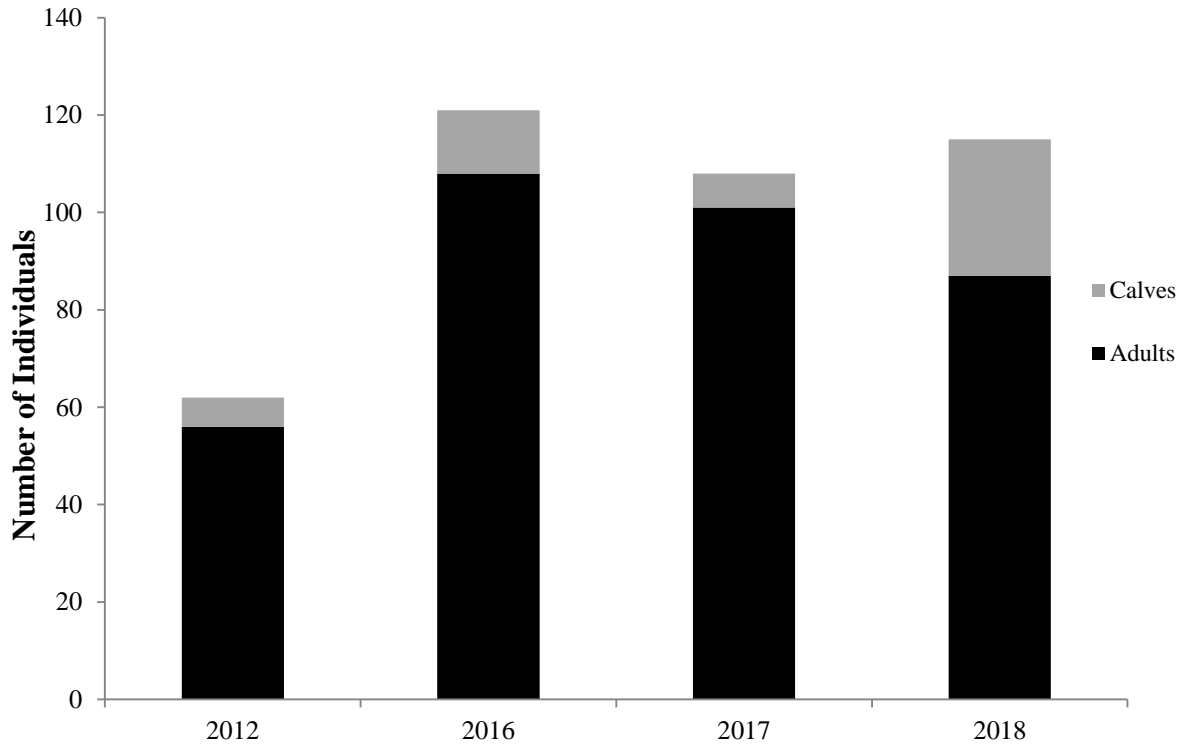


Figure 2. Number of adult and calf caribou counted during late winter recruitment surveys conducted between 2012-2018 in the Tweedsmuir-Entiako caribou herd winter range.

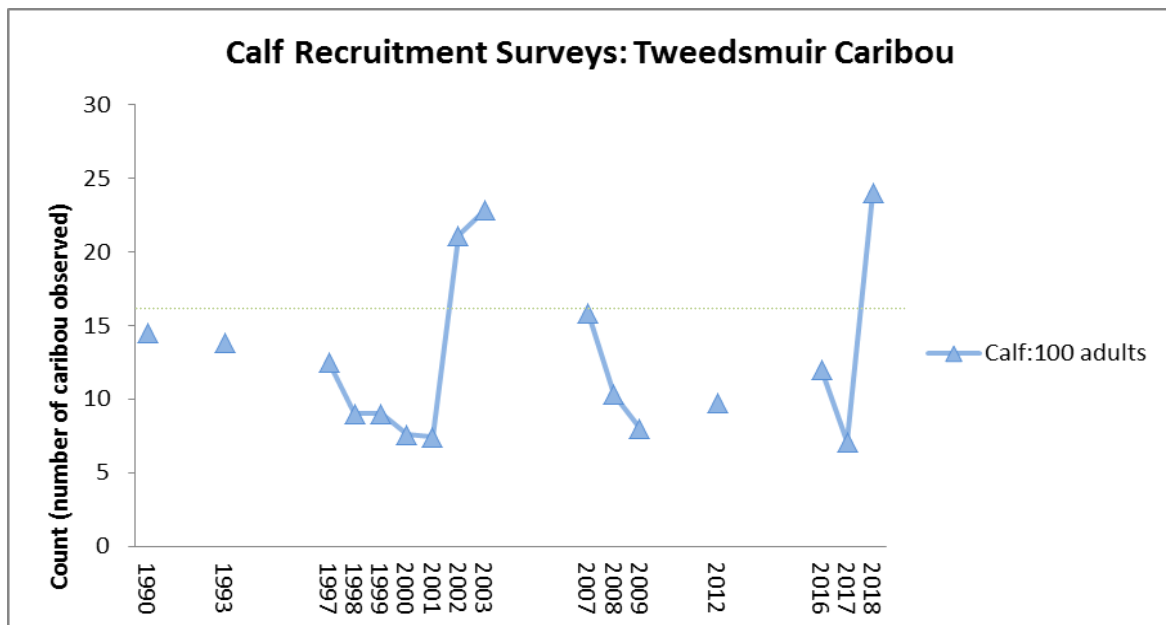


Figure 3. Late winter (March) calf recruitment for the Tweedsmuir caribou herd from 1990 to 2018

Note that there were varying types and intensities of monitoring programs from 1990 – 2018. This strongly influences the detectability of caribou on the winter range and strongly influences the minimum count and may influence the calf: 100 adult ratios.

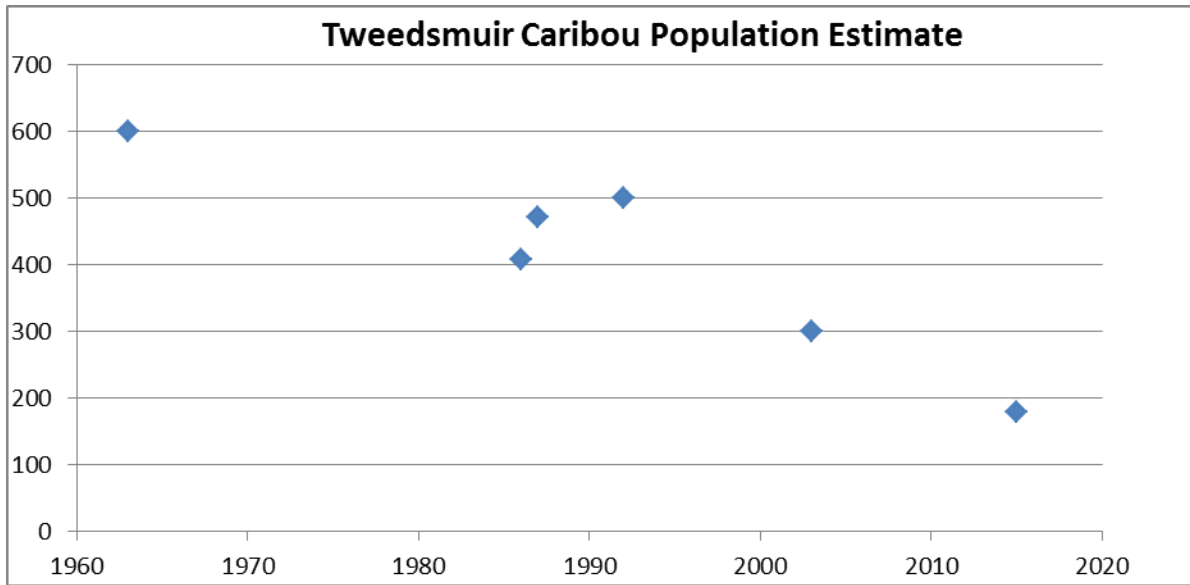


Figure 4. Tweedsmuir caribou population estimate) 1963 – 2015.

3.5 Incidental observations

There were no other species that were incidentally observed during this survey. There had been mortality of one of the collared caribou the day prior to this survey. This collar was collected and a mortality investigation was conducted.

4.0 Discussion

The Tweedsmuir Caribou Herd is a migratory herd, typically occurring in northern Tweedsmuir Park and throughout the western portion of the herd range in the spring, summer and fall and in the East Ootsa and Entiako Park and adjacent forest to the east and south during the winter. In winter, Tweedsmuir caribou use both low elevation mature pine-lichen forests, often in complex with low elevation wetlands, and higher elevation mature coniferous forests. The range of the herd covers approximately 1,760,000 ha, with over 1 million ha protected within Tweedsmuir Park, Entiako Park, and Huchsduwachsdu Nuyem Jeess/ Kitlope Heritage Conservancy.

The population size of the Tweedsmuir caribou population can be difficult to determine because a significant part of the population may be below treeline at any given time (Cichowski, 2015), making it challenging to assess the population due to the dispersion of animals in low elevation forested areas during winter. Several survey methods have been used, however, population estimates are largely derived from aerial surveys conducted in the fall (October), when a larger proportion of the herd is in high elevation habitat and easier to locate. One of the earliest population estimates was 600 animals in 1963 (Cichowski, 2015). This estimate decreased to 200-300 animals in 2003 and subsequently, to 150-200 in 2015 and ~185 in 2017 (MFLNRO Skeena, 2017). Adult female caribou mortality rates have been consistently moderate to high,

while calf recruitment rates have been low to moderate over the course of the most recent monitoring period (MFLNRO Skeena, 2017; Roberts, 2016). Population estimates from 1963 to 2017 are available for this herd (Figure 7). Using collared animals that represent a sufficient portion of the estimated population to guide monitoring of calf recruitment and to evaluate adult mortality provides the necessary information for informing the population trajectory, or lambda.

This survey on its own can be used to provide a minimum population count of 115 caribou as well as provide calf recruitment information, namely calf: 100 adult ratios. Caribou populations generally increase when annual recruitment rates exceed the 15-16% required to balance natural adult mortality and maintain population stability (Bergerud, 1992). Cichowski (2015) summarized historic Tweedsmuir calf recruitment from 1985 to 2009. The estimated population trend for the Tweedsmuir caribou herd from 2006-09 was declining with a range in lambda for between 0.797 – 0.899 and calf proportion values from 7.4 to <15. The 24 calves/100 adults observed in March 2018 is considered to be extremely high and well above what has been recently and historically observed.

This follows the fall 2017 (October) survey which resulted in a minimum count of 146 caribou, an increase from the 94 counted in 2013 (Roberts & Grant, 2017). Furthermore, 24% of the total count were calves (Roberts & Grant, 2017), well above the 15% suggested for a stable population (Bergerud, 1996) and a significant increase from the 2016 survey where calves were 14% of the total count. Annual calf recruitment for the Tweedsmuir caribou, as measured during late winter surveys, is available from 1990 through 2018 (Figure 3). Recruitment averaged 11% across all surveys throughout this time period, with 13 out of 17 surveys indicating recruitment well below levels required to maintain a stable population.

Survey results starting in 2015, together with this calf recruitment survey and ongoing population monitoring, are used towards re-evaluating population metrics for this herd. The previous population estimate was done in 2003 and estimated the population at 200-300 animals (Cichowski 2015) with a generally declining trend. The current population is estimated to be between 150 and 200 and is considered declining. Recent radio-collared data (2014-2018) from the Tweedsmuir caribou was used to estimate an annual survival rate of 0.786 for adult females, with the vast majority of known mortality causes being attributed to wolf (*Canis lupus*) predation. When combined with recent estimates of juvenile recruitment, these survival estimates yielded a population growth rate of 0.885, which suggests a rapidly declining caribou population (DeMars and Serrouya, 2018).

5.0 Acknowledgements

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