Population Status for the

Chilcotin Complex Caribou Herds,

Cariboo Region, 2020

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SUMMARY

In June 2020 the Itcha-Ilgachuz, Rainbows and Charlotte Alplands caribou herds were counted by aerial surveys. The Itcha-Ilgachuz herd had 382 individuals during the survey and 42 individuals during the follow up flights, giving a minimum count of 424 individuals. A total of 14 collars were seen out of a possible 21. This gave a population estimate of 508. Neonate recruitment was 30%. The Rainbows herd had a minimum count of 24 individuals (33% calves), a decline from the 32 individuals in 2016. The Charlotte Alplands had a minimum count of 25 individuals (40% calves) the same as the count in 2001.

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INTRODUCTION

The Chilcotin Complex comprises of three herds of caribou: Itcha-Ilgachuz, Rainbows and Charlotte Alplands (Figure 1). Since 2003 these hears have been in a decline, most recently a 40% decline from 2018-2019 by the Itcha-Ilgachuz herd (Shores 2019). Given this decline, predator management in the form of wolf reductions were undertaken starting in February 2020 in an effort to recovery these herds (BC FLNRORD 2020). It is recommended that caribou populations with predator management occurring be censused once every year. These three herds were last surveyed in June 2019, October 2016 and July 2001. June is the optimal time of year to census these herds as the caribou are concentrated in alpine habitat during calving (Cichowski 1993) and that makes it easier to locate and count them. Objectives of the caribou surveys were to obtain minimum caribou counts, population estimates, and neonate recruitment rates to assess population trends over time.

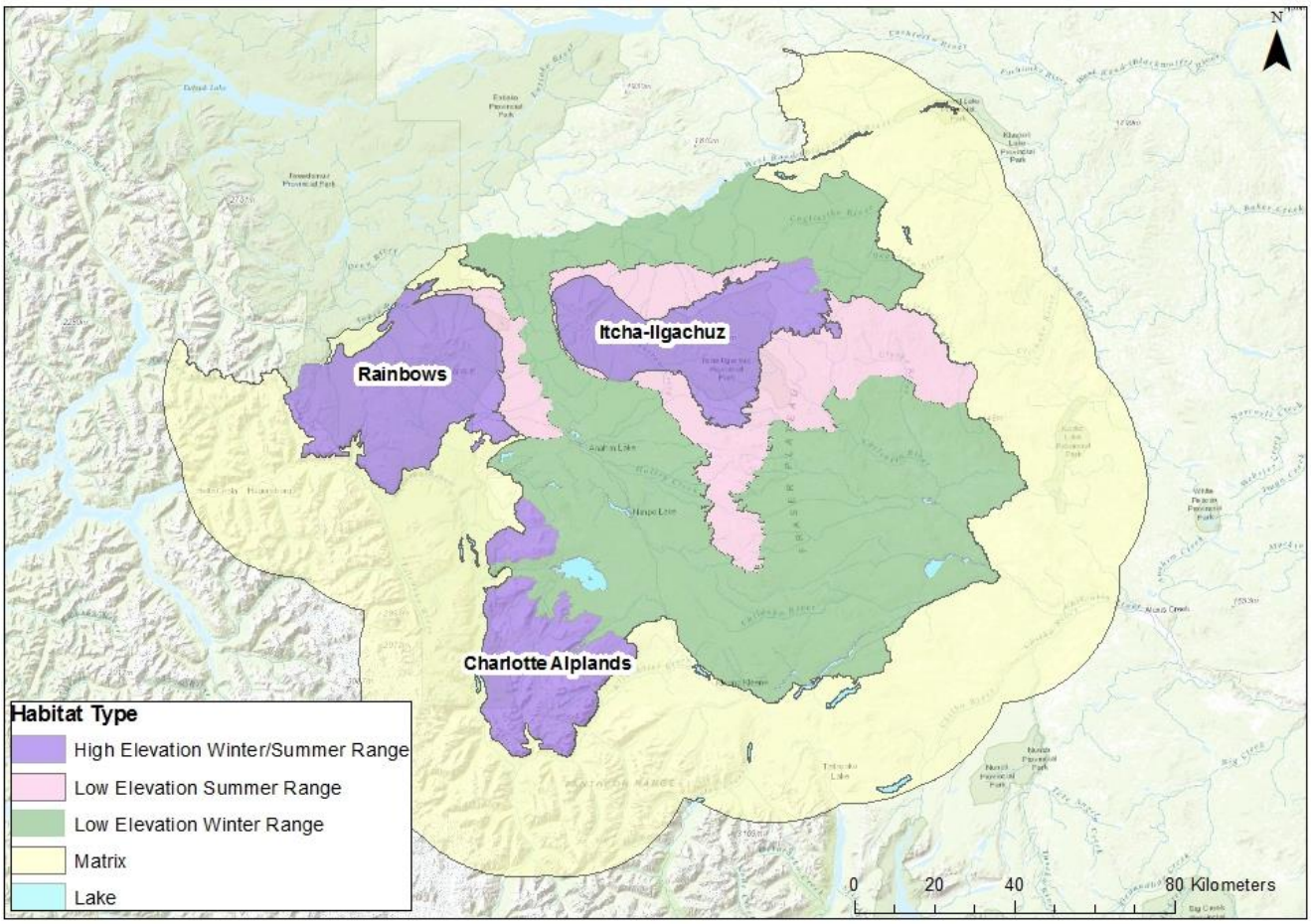

Figure 1: Map of the Chilcotin complex caribou herds: Itcha-Ilgachuz, Rainbows and Charlotte Alplands

METHODS

A sub-sample of the caribou population has GPS collars, enabling us to use mark-resight methods to estimate the population. The caribou survey was conducted in two stages: a pre-survey telemetry fixed-wing flight followed by rotary survey. The purpose of the telemetry flight was to locate all collared caribou, determining the number of active radio-collars within the defined survey area. Using a Bell 206 Jet Ranger, mountain complexes were flown counter clockwise near treeline and included coverage of all suitable caribou subalpine/alpine habitat. Flight tracks (Figure A1) and caribou locations (Figure 2) were recorded using a handheld GPS unit.

Caribou were classified into the following categories: adult cow, adult bull, yearling, calf and unclassified. Unclassified animals were caribou whose age and sex could not be determined; thus, the unclassified category may include adults of either sex. When a collared caribou was visually detected within a group of caribou, surveyors identified the individual animal by ear tag color combination, and then verified the collar radio frequency. If the collared caribou was a cow, presence of a calf was recorded. Any collared animals not seen during the survey were located after during a follow-up flight to assess calf presence and this information was used to obtain a minimum known alive population size.

Survey estimates were calculated in R studio using mark-resight calculations for a closed population and a single resight event. The estimate is derived using a simplified joint hypergeometric estimator (JHE) called the Petersen method (Krebs 2014): $N = \frac{(M+1)(C+1)}{(R+1)} - 1$, where N is calculated survey estimate, C is the total caribou observed during the survey, M is the number of collared caribou available and R is the number of collared caribou seen. We know that cows and bulls are observed at different rates as cows are often up in the alpines calving, whereas bulls can still be occupying areas down in the timber or sub-alpine habitats (Cichowski 1993). Because of this, a population estimate for each caribou classification (cow, bull, unclassified adult, yearling, and calf) is run separately and summed afterwards. The cow and bull population estimates are calculated using the number of collared individuals for each sex. Calf estimates are calculating using the number of cow collared individuals as a surrogate given calves are not seen without cows and yearling/unclassified adult estimates are calculated using all collared individuals. Confidence intervals were calculated for cows and bulls using a binomial distribution (Kerbs 2014), but this could not be done for calves, yearlings or unclassified adults. We, also, calculated an estimate of the percent calves as the number of calves divided by the total population, however this should not be viewed as an estimate of calf recruitment. Calf recruitment is measured in March so the percentage of calving in the population can only be interrupted as a measure of neonate survival.

RESULTS

The Chilcotin complex caribou census was completed over 4 days from June 22 till June 25, 2020. A total of 473 caribou were observed in 47 sightings (Figure 2) as well as other species (goats and grizzly bears).

Survey Conditions

The crew experienced good survey conditions for both days of the Itcha-Ilgachuz survey. The visibility was good with overcast skies and light wind and rain. The day in the Rainbows range had to be paused due to fog, but otherwise the conditions were good with light wind. The final day, in the Charlotte Alplands range had the best survey conditions, with excellent visibility, mostly clear skies and light winds that increased during the day. Overall, more snow was present still on the mountains than in previous years.

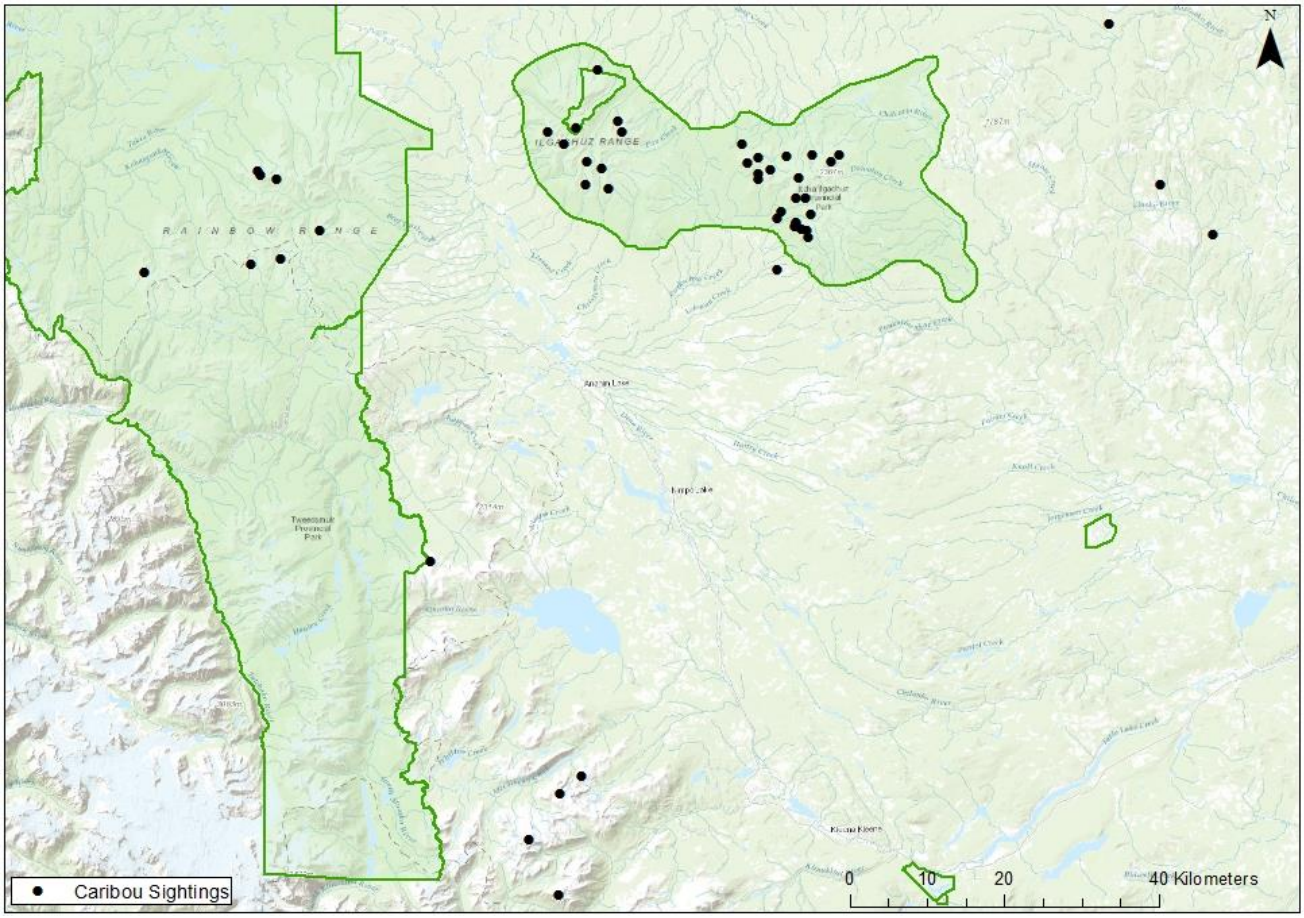

Figure 2: Map of the caribou sightings during the 2020 Chilcotin complex post-calving caribou survey

Itcha Ilgachuz Herd

For the Itcha-Ilgachuz herd, a total of 382 caribou were counted during the survey and 42 during the follow-up flight giving us a minimum count of 424 caribou (Table 1). Although there was a 32% increase from the 2019 population estimate (Figure 3) the adult population is not expected to have increased. In 2019, the adult population estimate was 336 adults with 346 adults estimated this year. This year the population consisted of 30% calves (Figure 4). The sightability was higher for cows and lower for bulls compared to last years with 2/3 of all collars being sighted (Table 2).

Table 1. Itcha-Ilgachuz post-calving 2020 population estimate and minimum count.

	Adult Cows	Adult Bulls	Unsexed Adults	Yearlings	Calves	Total
Caribou observed during survey (C)	227	22	1	6	126	382
Caribou observed during follow-up	0	11	28	3	0	42
Minimum Count	227	33	29	9	126	424
Marked Seen (R)	13	1	-	-	-	14
Marked Available (M)	16	5	-	-	-	21
95% Confidence Interval	160-457	21-500				
Population Estimate	276	68	2	9	153	508

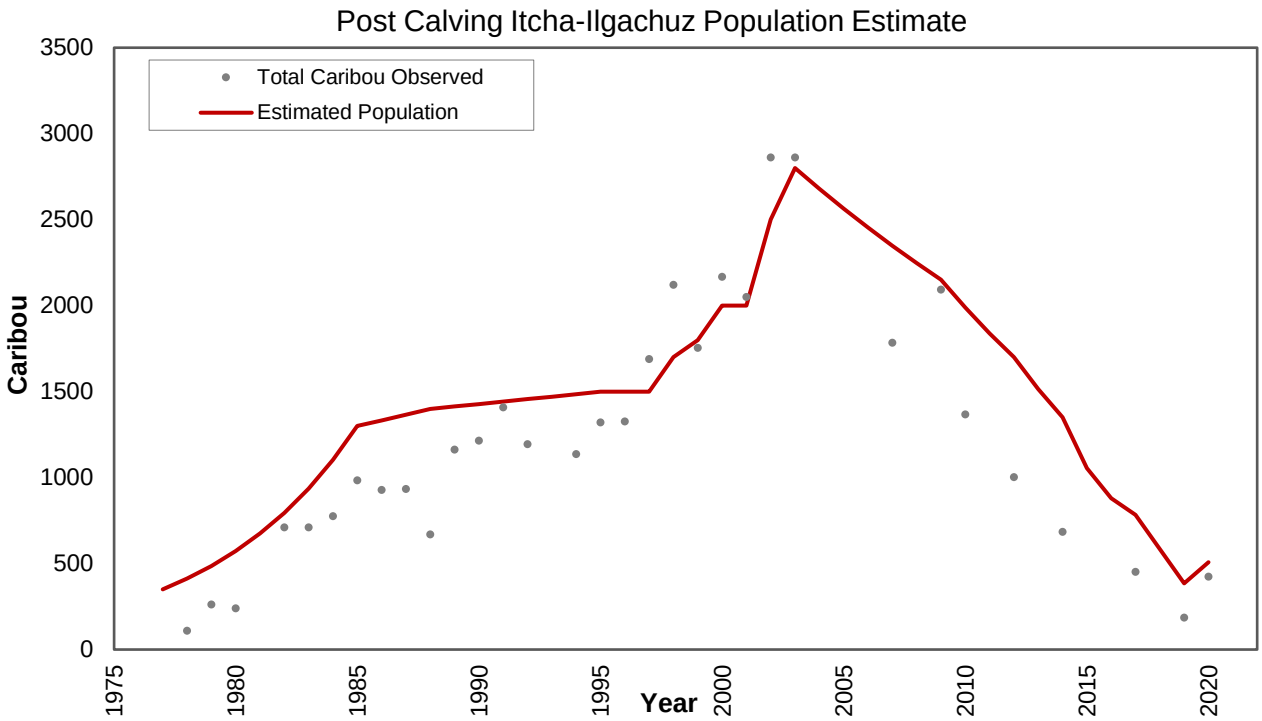

Figure 3: Itcha-Ilgachuz herd population estimates from 1977 – 2020 during post-calving surveys

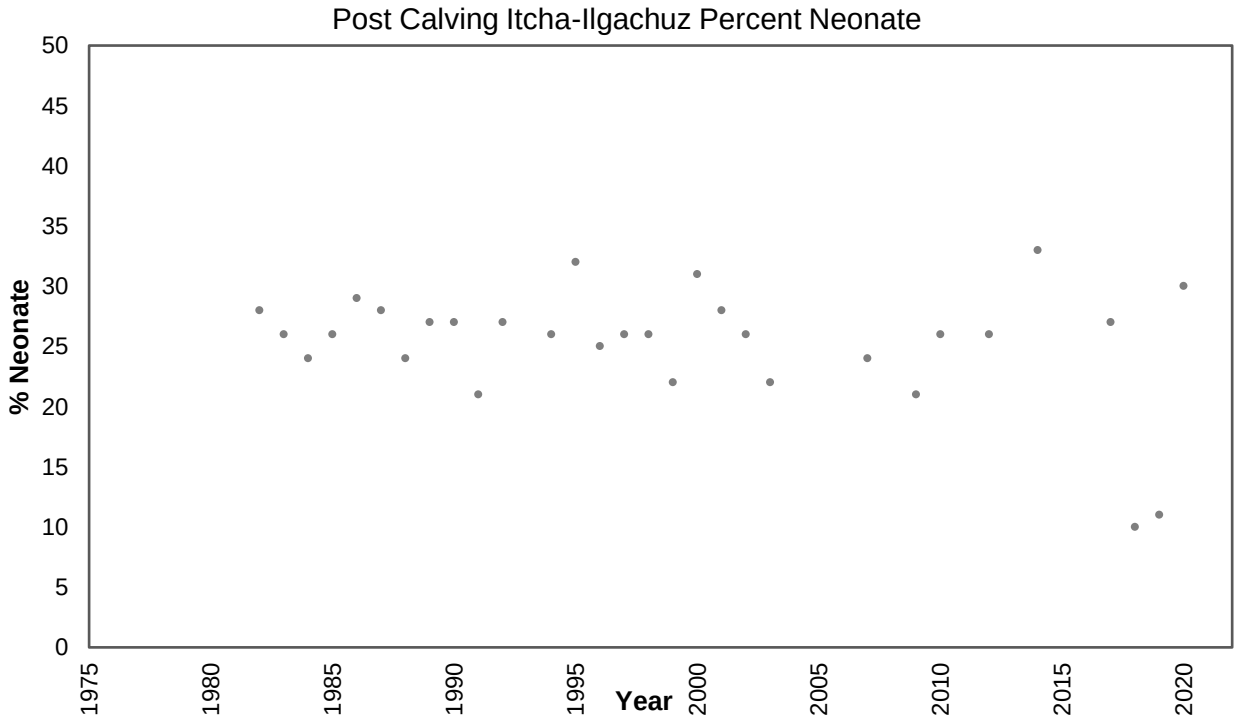

Figure 4: Itcha-Ilgachuz herd percentage of neonates from 1977 – 2020 during post-calving surveys

Table 2. Collars available and sightability of adult Itcha-Ilgachuz caribou in 2018, 2019 and 2020.

Survey Year	**2018**	**2019**	**2020**
Cow collars available	23	19	16
Cow collars sighted during survey	17	8	13
Cow Sightability	**73.9%**	**42.1%**	**81.3%**
Bull collars available	15	6	5
Bull collars sighted during survey	11	4	1
Bull Sightability	**73.3%**	**66.7%**	**20.0%**
All adult collars available	38	25	21
Adults sighted	28	12	14
Pooled Adult Sightability	**73.7%**	**48.0%**	**66.7%**

Rainbows Herd

For the Rainbow herd, a total of 24 caribou were counted during the survey giving us our minimum count (Table 3, Figure 5). 33% of the population was calves (Figure 6). There were two collared individuals in this herd area and both were seen during the survey.

Table 3. Rainbow post-calving 2020 survey observations and minimum count.

	Adult Cows	Adult Bulls	Unsexed Adults	Yearlings	Calves	Total
Caribou observed during survey	15	1	0	0	8	24
Minimum Count	15	1	0	0	8	24

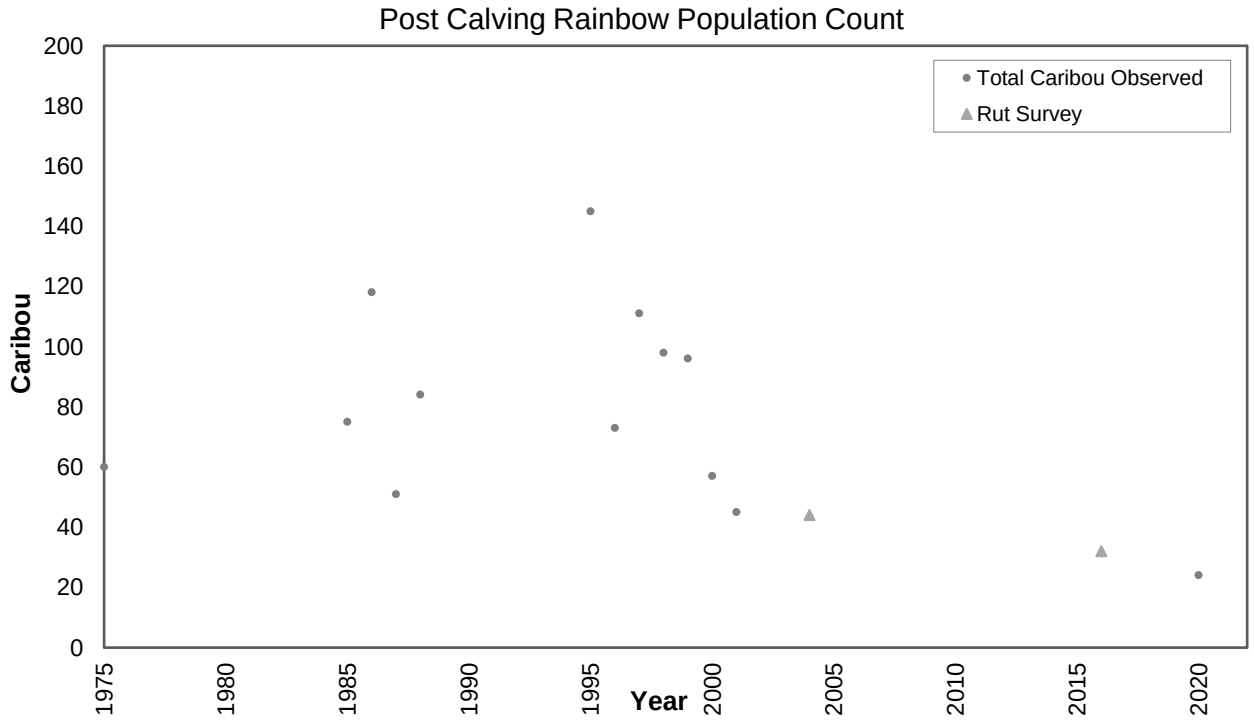

Figure 5: Rainbows herd minimum count from 1975 – 2020 during post calving surveys. Points from two rut surveys are included for recent comparisons.

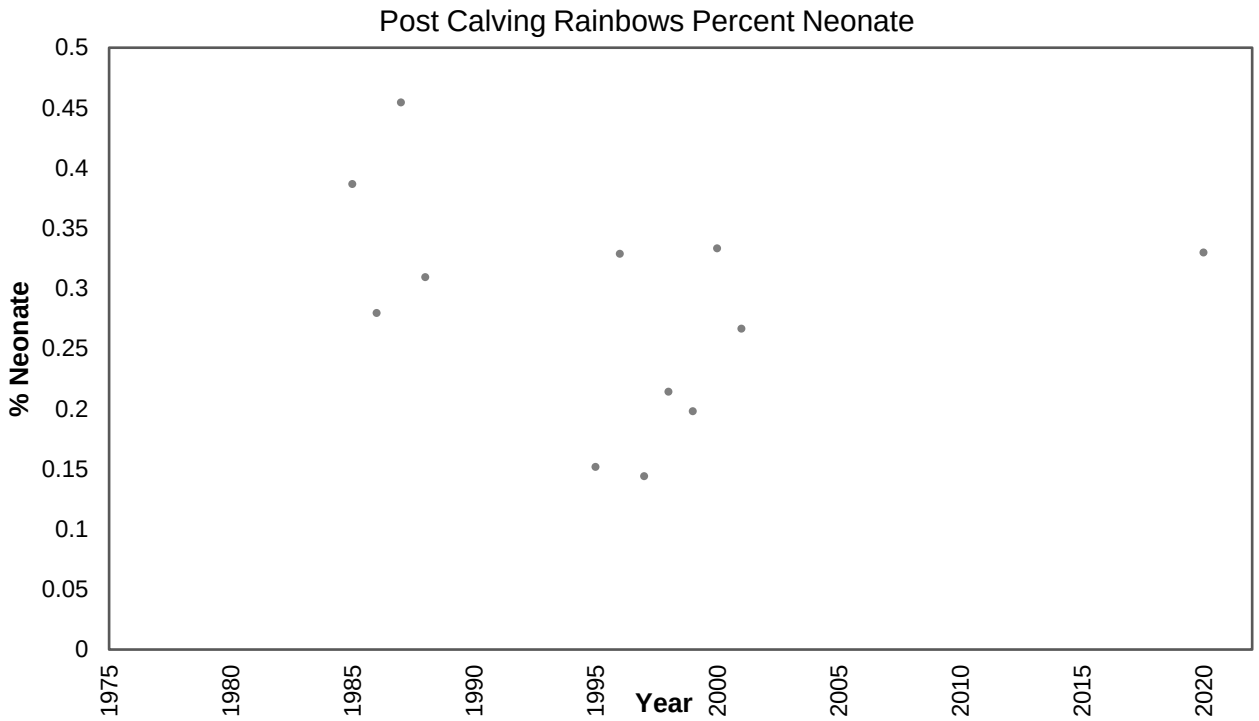

Figure 6: Rainbows percent neonates from 1985 – 2020 during post calving surveys

Charlotte Alplands Herd

For the Charlotte Alplands herd, a total of 24 caribou were counted during the survey and 1 during the follow-up flight giving us a minimum count of 25 caribou (Table 4, Figure 7). The population was comprised of 40% calves (Figure 8) and the sole radio collar present in the range was located during the follow-up flight.

Table 4. Charlotte Alplands post-calving 2020 survey observations and minimum count.

	Adult Cows	Adult Bulls	Unsexed Adults	Yearlings	Calves	Total
Caribou observed during survey	14	0	0	0	10	24
Caribou observed during follow-up	1	0	0	0	0	1
Minimum Count	15	0	0	0	10	25

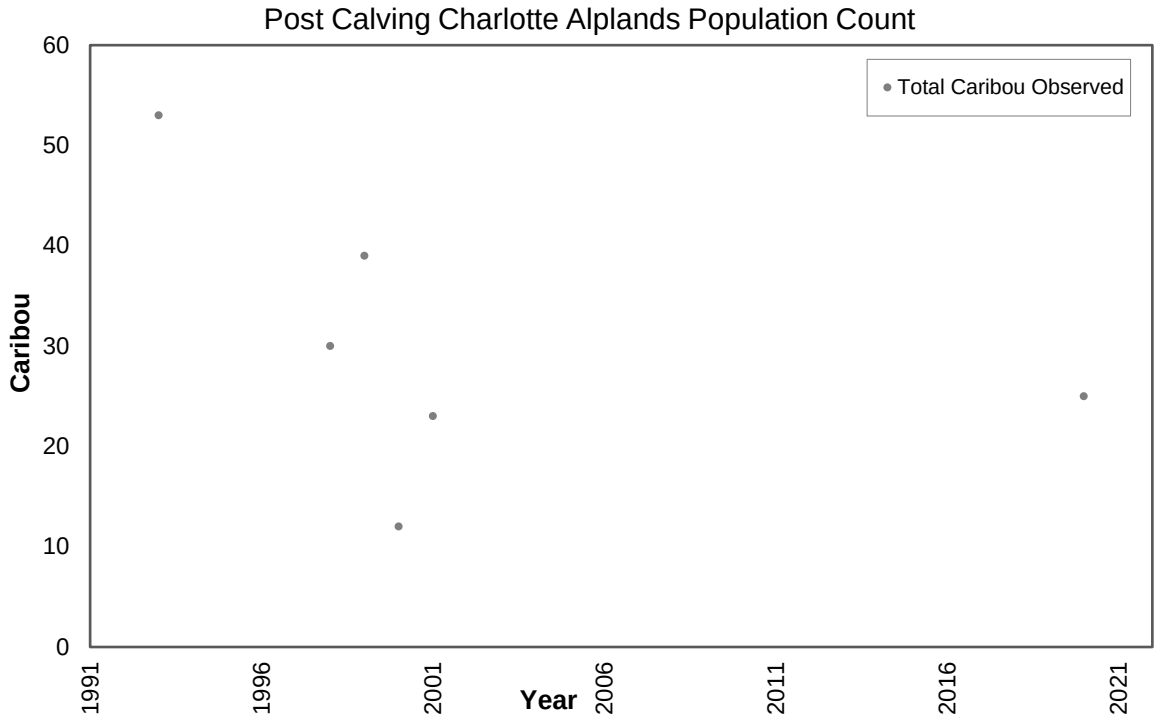

Figure 7: Charlotte Alplands herd minimum count from 1993 – 2020 during post calving surveys

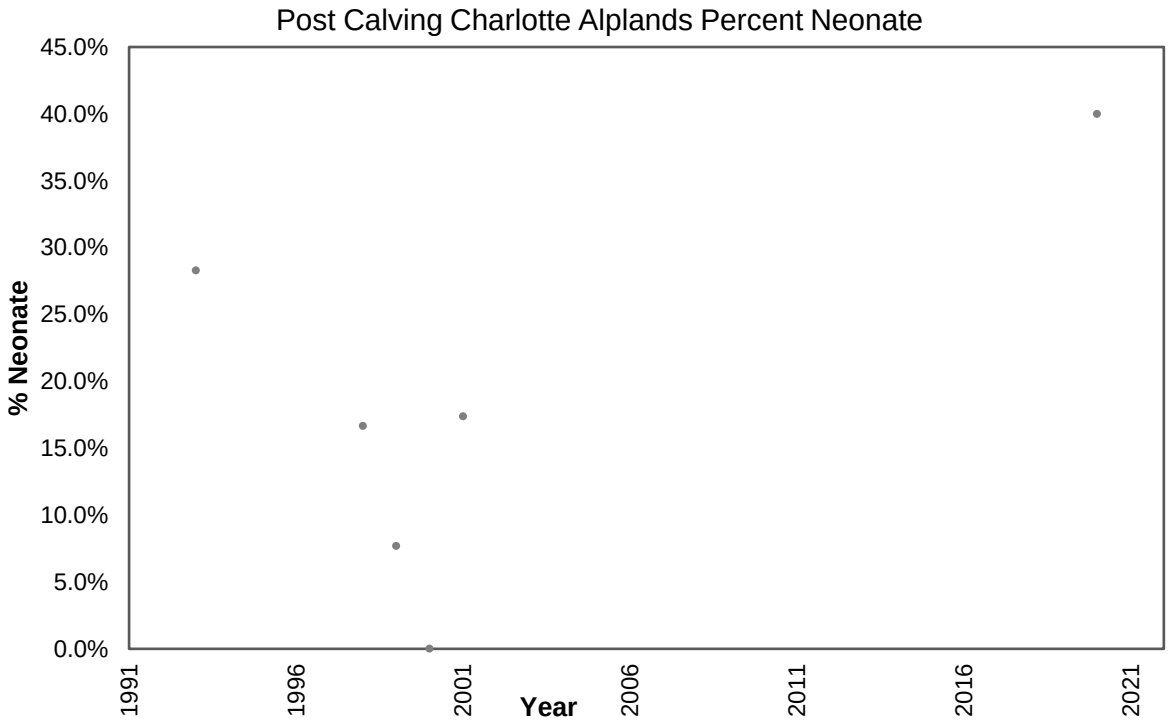

Figure 8: Charlotte Alplands herd percent neonates from 1993 – 2020 during post calving surveys

DISCUSSION

In 2019, the decision was made to undertake predator management in the Itcha-Ilgachuz caribou herd area to attempt to reverse the decline of the herd (BC FLNRORD 2018). Since 2003 the caribou herd had been in decline with a most recent 40% decline from 2018 to 2019 (Shores 2019). In addition, calf recruitment had failed in 2018 and 2019. In February 2020, aerial wolf removals occurred in the core area of the Chilcotin complex caribou (BC FLNRORD 2020). This management action appears to be successful on the short term as the Itcha-Ilgachuz population increased by 32% from 2019 and 30% of the population is calves. Although the population is said to have increased, the number of adults estimated is similar to 2019. Therefore, this increase in the population is actually just an increase in neonate survival. Similar comparisons can not be made of the Rainbows and Charlotte Alplands herds, as there had not been surveyed recently, however both populations persist, and this year had a high percentage of calves.

Survey Cost

The total survey cost was $40,286 ($42,438 including GST). The survey was conducted in a total of 27 helicopter flight hours and 11 fixed wing hours for the pre-survey flights. 9.7 hours were flown for the Itcha-Ilgachuz range, 7.1 for the Rainbows and 5.6 for the Charlotte Alplands Herd.

Conclusions

- 2020 Itcha-Ilgachuz herd population estimate is 508 caribou
- The one-year trend is increasing, the long-term trend is decreasing
- 2020 Rainbows herd minimum count in 24 caribou
- 2020 Charlotte Alplands herd minimum count is 25 caribou
- Neonate survival is between 30-40% for the complex

ACKNOWLEDGEMENTS

Funding for these surveys was provided by the Mountain Caribou Recovery Implementation Program. Arduini Helicopter Ltd. and Cariboo Air were contracted to conduct the flights. The flights were navigated by Pat Dielman with rear observers Dan Lirette and Emily Blythe. During the survey, accommodation and meals were provided at Eagles Nest Resort in Anahim Lake.

LITERATURE CITED

BC Ministry of Forests, Lands, Natural Resources Operations and Rural Development (2018). Predator management in support of the Itcha-Ilgachuz northern caribou herd. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Wildlife Section, Williams Lake, BC

BC Ministry of Forests, Lands, Natural Resources Operations and Rural Development (2020). Wolf reduction in support of Itcha-Ilgachuz caribou recovery – Year 1 summary report. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Wildlife Section, Williams Lake, BC

Cichowski, D. B. (1993) Seasonal movements, habitat use and winter feeding ecology of woodland caribou in west-central British Columbia. BC Ministry of Environment, Lands and Parks, Prince George.

Krebs, C.J. (2014). Ecological Methodology. Chapter 2: Estimating abundance and density: mark-recapture techniques. 2nd edition. Benjamin Cummings Publishing.

Shores, C. R. 2019. 2019 Itcha-Ilgachuz caribou post-calving population survey. Ministry of Forests, Lands, Natural Resource Operations and Rural Development, Wildlife Section, Williams Lake, BC

APPENDIX

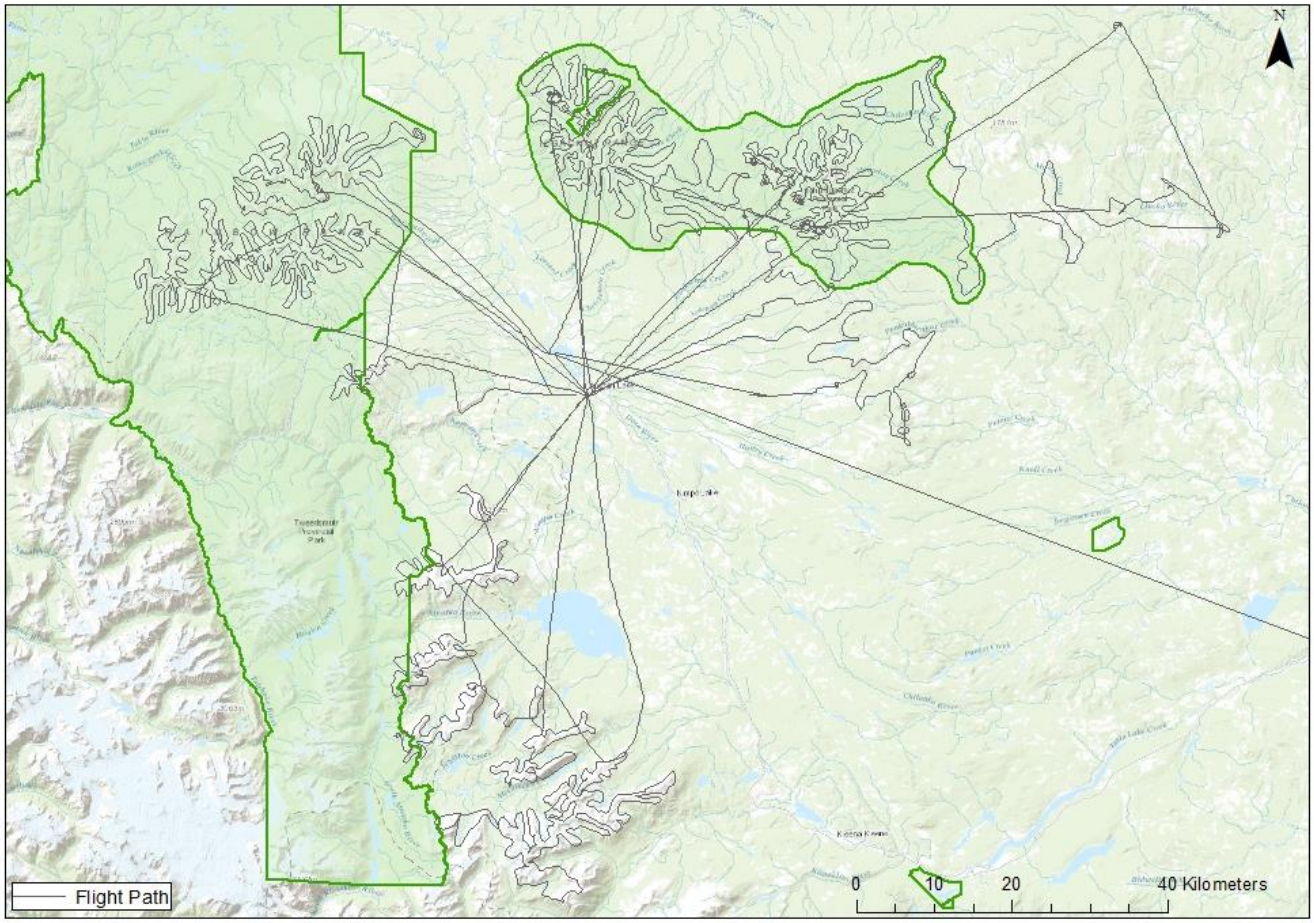

Figure A1: Map of survey flight paths for the post calving caribou census for the Chilcotin Complex herds.