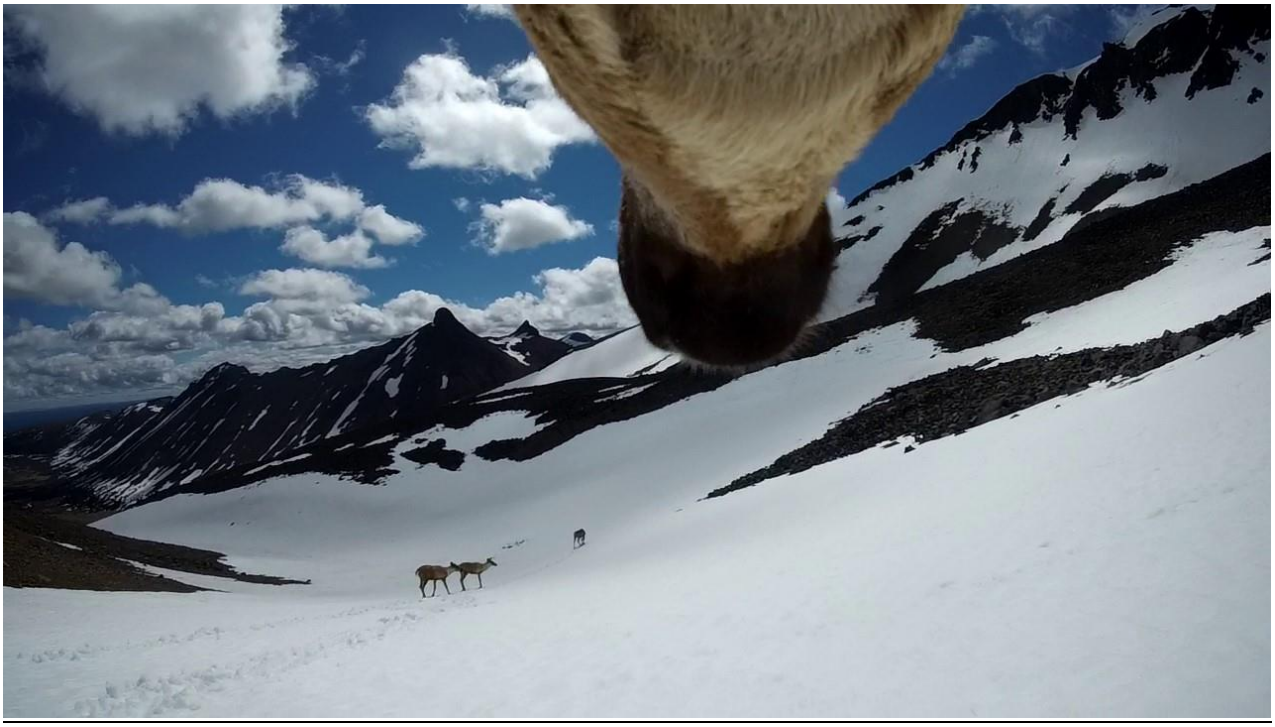
CARIBOO REGION TECHNICAL REPORT

ITCHA-ILGACHUZ LATE WINTER RECRUITMENT SURVEY



Prepared by:

Kiara Gannon
Wildlife Biologist
Ministry of Water, Land and Resource Stewardship
Williams Lake B.C.

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CARIBOU RECOVERY PROGRAM

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Summary

The Itcha-Ilgachuz caribou herd experienced a rapid population decline of 80% between 2003 and 2019 (Shores 2019). In response to this population decline, a wolf reduction program was initiated in 2020 to recover the Itcha-Ilgachuz caribou population. Late-winter recruitment surveys provide a measure of calf survival to reproductive age, as well as a population response to the wolf reduction program. High calf percentages during late-winter recruitment surveys appear to be responsive to the wolf reduction program, with a 2023 calf percentage of 24.2%, which is the highest that's been recorded in the Itcha-Ilgachuz herd since the 1980's. These results highlight the effectiveness of the wolf reduction program as a short-term recovery measure. The strong year-to-year variation in recruitment correlating with number of wolves removed emphasizes that habitat protection and restoration measures are the long-term and ultimate solution to caribou recovery.

Introduction

The Itcha-Ilgachuz caribou subpopulation on the Chilcotin plateau are shallow snow, terrestrial lichen eating caribou. Using Committee on the Status of Endangered Wildlife in Canada (COSEWIC) classification, they fall under Designatable Unit 7 (DU7) and are a species of Special Concern (COSEWIC 2014). The Itcha-Ilgachuz caribou herd declined by 80% between 2003-2019 (Shores 2019). Given the rate of decline, in 2019 it was estimated that functional extirpation (<20 animals) was possible within the next eight years. A wolf reduction program was initiated in 2020 as an emergency measure to curtail rapid population decline for this herd and to plan for long-term habitat protection and restoration measures. The March 2023 recruitment survey was flown to estimate overwinter calf survival, which indicates survival of calves to reproductive age.

Methods

The March 2023 recruitment survey was flown in a Bell 206 Jet Ranger on March 25th and 27th. The survey was concentrated on Itcha-Ilgachuz caribou low elevation winter habitat. The distribution of caribou was unique in winter 2023 (Figure 1), as the majority of the Itcha-Ilgachuz herd was largely concentrated in densely forested areas South of the Itcha Mountains. This differs from their typical location in March which is between Puntzi and Tatla Lake north of Highway 20. Additionally, collared caribou (n=four) from the Rainbow herd remained in their alpine habitat through the winter rather than joining the Itcha-Ilgachuz herd in low elevation habitat as is usual. The two collared Charlotte Alplands caribou were just East of Charlotte Lake during the survey. Both Charlotte Alplands and Rainbow collars were surveyed as supplemental information.

There were 43 radio-collared caribou in the population at the time of the survey, 37 cows and six bulls. Caribou were located based on recent locations from GPS collars and by using VHF telemetry detection from the air. 37 of the collared caribou were located, but six collared

individuals were not found due to dense vegetation cover and weaker telemetry signals from older collars. Caribou were classified as either adults or calves. Unclassified animals are caribou whose age could not be determined. Attempts were made to determine if collared female caribou had calves with them. In some cases, it was difficult to tell which cow the calf was with, due to dense vegetation and restricting flight time near groups to reduce stress.

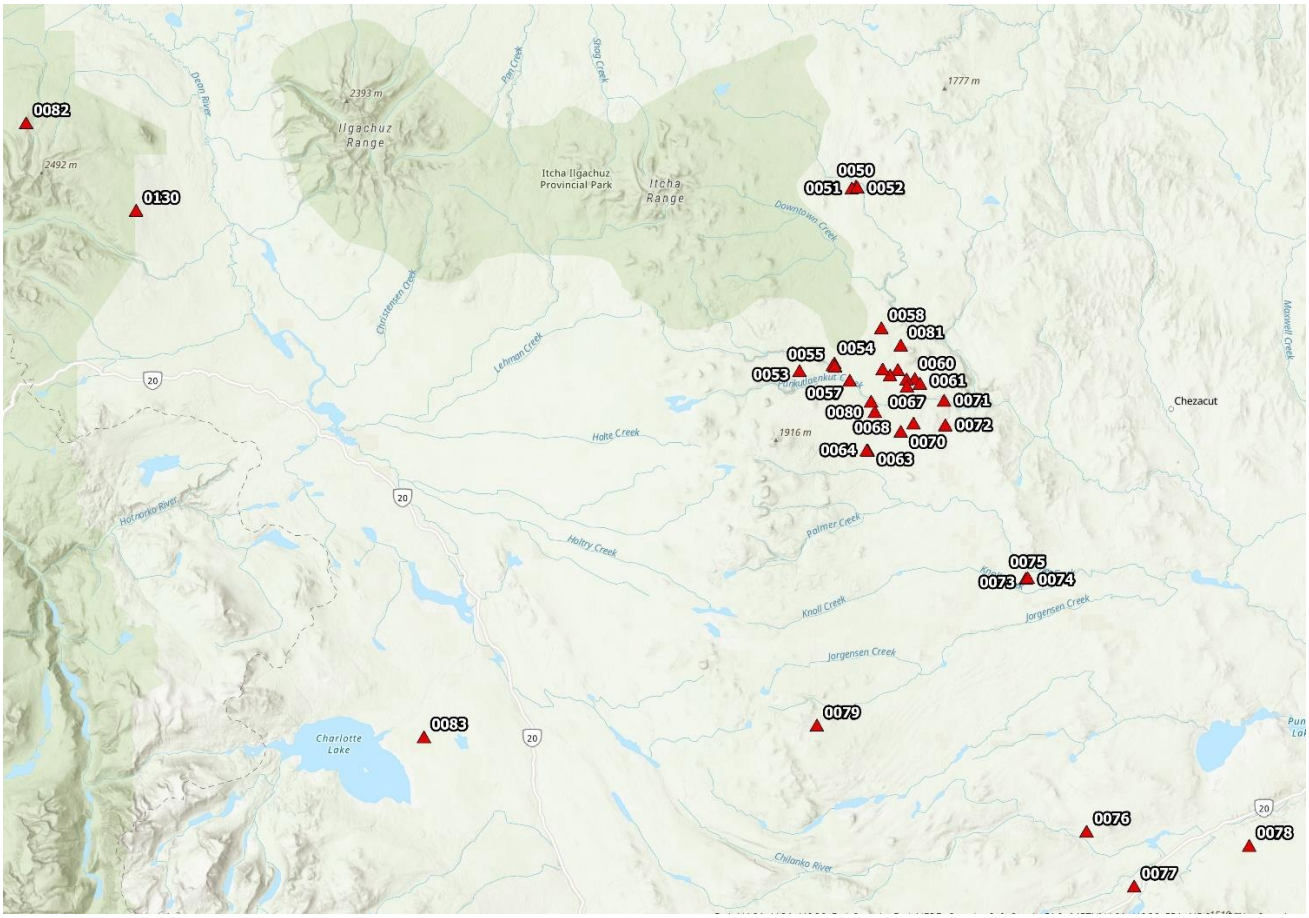

Figure 1. Caribou sightings from the March 2023 recruitment survey in the Itcha-Ilgachuz caribou subpopulation range.

Recruitment was approximated using calf percentage and calf to adult ratio.

$$Percent\ calves = \left(\frac{total\ calves}{total\ classifeid\ caribou}\right) * 100,\ where\ total\ classified\ caribou\ = \\ total\ calves\ +\ total\ adults\ -\ unclassified\ caribou$$

$$Calf\ to\ adult\ ratio = \left(\frac{total\ calves}{total\ adults}\right) * 100$$

An assumption to the stable caribou population threshold of 15% was tested by calculating the adult caribou survival during the 2022-2023 biological year to date (May 1, 2022 - April 30, 2023).

$$Estimated\ finite\ survival\ rate\ per\ biological\ year = finite\ daily\ survival\ rate^{(\#\ of\ days\ in\ biological\ year)},$$

$$where\ finite\ daily\ survival\ rate = \frac{\#\ radio\ collar\ days\ over\ period - \#\ of\ deaths\ over\ period}{\#\ of\ radio\ collar\ days\ over\ period}$$

Results

Weather conditions were fair for surveying. On March 25th there was low cloud cover, but visibility was good due to the low elevation survey location. One March 27th the visibility was good with partial cloud cover. Conditions were calm, with no recent snow, and temperatures ranged from -2 to -7 Celsius.

Itcha-Ilgachuz Herd

In the Itcha-Ilgachuz herd, a total of 188 caribou were counted, 138 adults, 44 calves and 6 unclassified caribou, for a calf percentage of 24.2% and a calf to adult ratio of 32 (Figure 2). We were able to locate 32 collared cows, of which we were able to determine whether 23 of them had a calf or not. For the remaining nine collared cows it was unclear if they had a calf or not due to low sightability in dense forest or being mixed in large groups. Of the 23 collared cows where calf presence was determined, 12 cows had a calf, giving a calf to cow ratio of 52. However, this estimate is likely high due to bias introduced from not being able to determine if nine collared cows had a calf or not. The estimated annual adult survival in the Itcha-Ilgachuz herd from May 2022 - April 2023 was 85%.

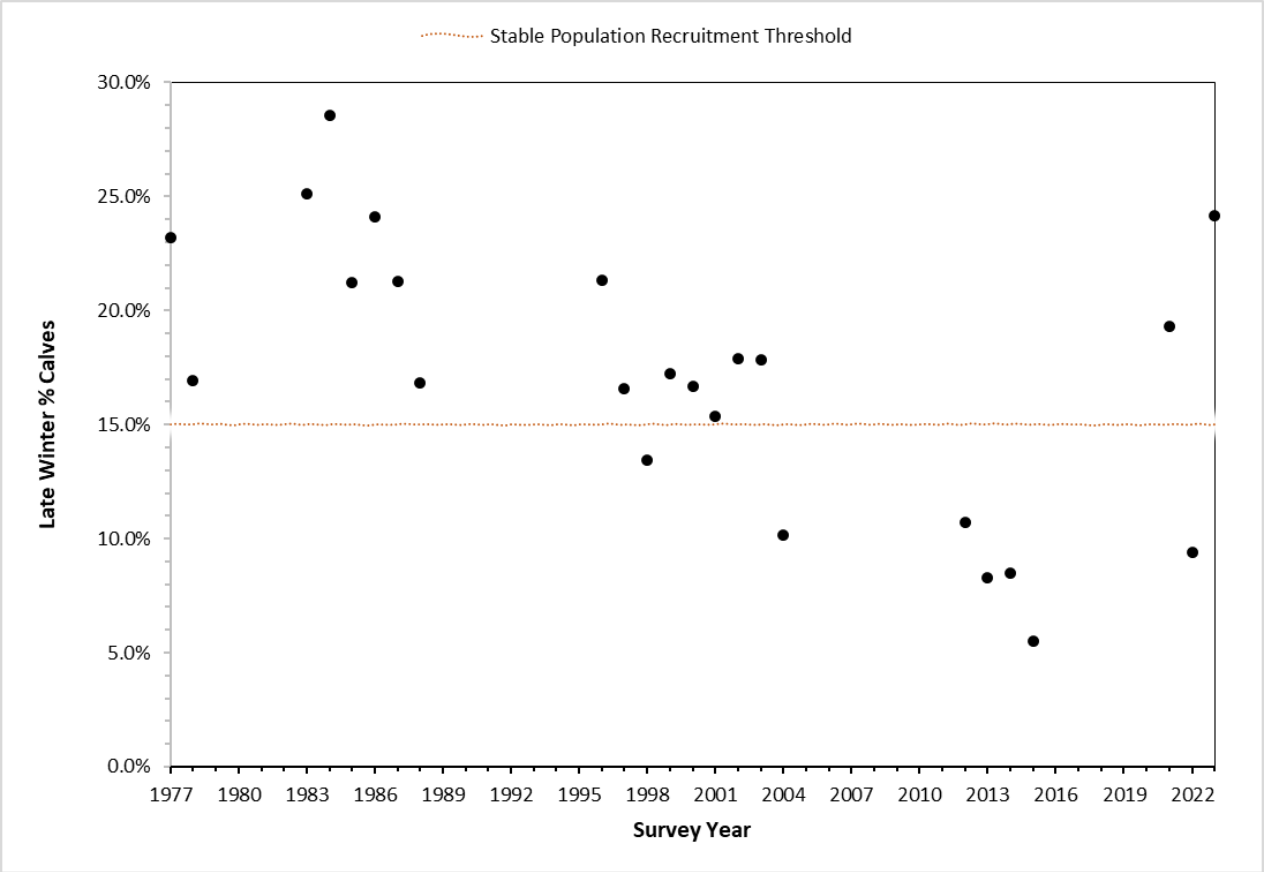

Figure 2. Itcha-Ilgachuz late winter recruitment surveys from 1977-2023. The dashed line indicates the recruitment level of 15% needed to maintain a stable population (Bergerud 1980). Recruitment above 15% indicates possible population growth, while recruitment below this level indicates possible decline.

Rainbow Herd

In the Rainbow herd, a total of 23 caribou were counted, 19 adults and 4 calves, for a calf percentage of 17.4% and a calf to adult ratio of 21. All four collars were located. The collared groups occupied the North side of the Rainbow Range on a windswept North facing slope with access to drainages (Figure 3). The snowpack remained shallow throughout the winter which may have contributed to the caribou remaining at high elevation (1700-2300m) throughout the winter months (Figure 4).

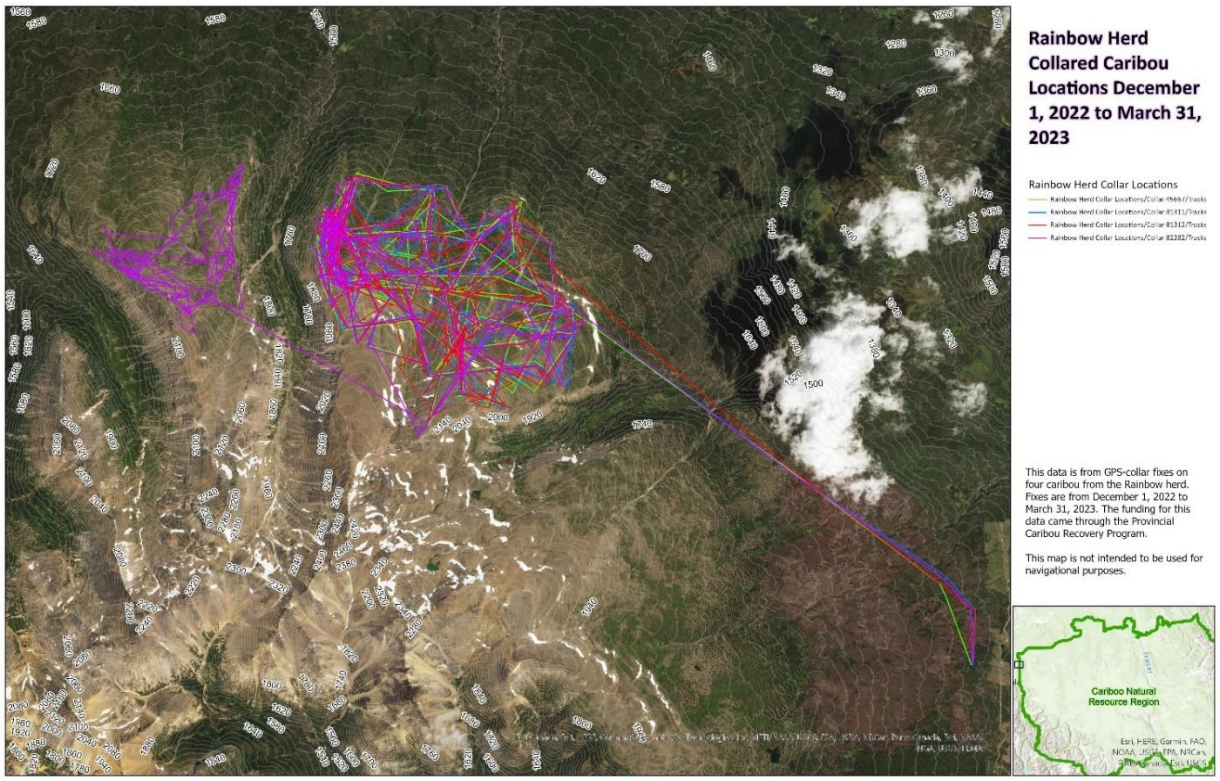

Figure 3. Map of Rainbow herd movement using GPS-collared caribou locations from December 1st, 2022, to March 31st, 2023.

Figure 4. Photo taken on February 14th, 2023, during a caribou pellet collection project. Photo shows a low snowpack on one of the windswept slopes that Rainbow herd caribou occupied throughout winter 2023.

Charlotte Alplands Herd

In the Charlotte herd, a total of 9 caribou were counted, 7 adults and 2 calves, for a calf percentage of 22.2% and a calf to adult ratio of 29. These indicators should be viewed lightly, due to the low sample size, and only one of two collared cows in the Charlotte Alplands being located.

Discussion

A recruitment rate of 15% is considered a threshold for a stable caribou population when coupled with an 85% adult survival rate and normal sex ratios (Bergerud 1980). The estimated survival during the 2022-2023 biological year was at the assumption level at 85%. However, the normal sex ratio assumption was not tested as caribou were not classified as bull or cow during this survey. That said, the 2023 calf percentage of 24.2% is well above the stabilizing recruitment level of 15% needed to maintain a stable caribou population (Bergerud 1980). The 2023 late-winter calf percentage is the highest that's been recorded for the Itcha-Ilgachuz herd since 1986. The overall positive outlook for the Itcha-Ilgachuz herd is further supported by 12 of 23 collared cows having a calf recorded with them (caveat of 9 collared cows with calf presence unknown), and by high collared adult caribou survival during the 2022-2023 biological year.
During March 2021, 2022, and 2023 recruitment surveys the calf percentages were 19.3. 9.4, and 24.2% respectively. While 2021 and 2023 calf percentages showed large improvements compared to pre-wolf reduction March recruitment results from 2012-2015 (5.5-10.7% calves), 2022 had similar recruitment to pre-wolf removal levels. Although it is not possible to say with certainty why the March 2022 recruitment levels were lower, the number of wolves removed in Feb 2021 (n=19) was much lower than February 2020 (n=94) and February 2022 (n=66). The lower number of wolves removed in 2021 may have contributed to lower calf survival and recruitment through increased wolf predation. Increased wolf removal in 2022 may have corrected for this allowing calf percentages to increase again. This would support other findings that wolf reduction, or lack of, is capable of quickly changing caribou population parameters (Serrouya *et al*. 2019). These results highlight that wolf reduction is an emergency measure to prevent the loss of caribou in the Chilcotin and that the long-term solution for caribou recovery requires a reduction in habitat disturbance and extensive habitat restoration.

Management Recommendations

- Late-winter calf percentages in the Itcha-Ilgachuz herd have increased post-wolf reduction, except in 2022 following a reduced number of wolves removed in 2021. 2023 recruitment results are very promising, and wolf reduction measures should continue to allow for further recovery of the herd.
- Habitat protection and restoration measures must be implemented in Itcha-Ilgachuz caribou herd habitat to allow for long-term population stabilization and recovery.
- Habitat protection measures include the following:
    - Amend the Government Actions Regulation (GAR) order under the *Forest and Range Practices Act* to further protect caribou habitat in Wildlife Habitat Areas within Itcha-Ilgachuz herd range.
    - Consider implementing a *Wildlife Act* Wildlife Management Area (WMA) that focuses on Itcha-Ilgachuz caribou habitat conservation.
    - This GAR order amendment or WMA implementation should focus on:

        - Retaining and recruiting large tracks of mature forest, while considering current caribou habitat use (using GPS collar locations). Focus should be on reducing the amount of disturbance and the disturbance frequency, as caribou require large, connected areas of mature forest to forage, reproduce, and avoid predators (Seip 1991; Wilson *et al*. 2019).
        - In many systems, predation is a key factor in caribou population growth and decline. Any further development in caribou habitat should minimize the number of linear features created, as caribou avoid areas with high density of linear features (Apps 2020) and linear features are known to facilitate predator movement and efficiency (Apps *et al*. 2013; Dickie *et al*. 2017; Apps 2020).
- Habitat restoration measures include the following:
    - Allocate funding from multiple sources (federal, provincial, and conservation partners) towards caribou habitat restoration programs in the Chilcotin. Initial funding should support staffing resources as restoration programs require significant planning, engagement, and project management to get to operational phases.
    - Caribou habitat restoration should focus on:
        - Reducing the number of linear features in critical caribou habitat through road restoration programs.
        - Recruiting future caribou habitat by rehabilitating/planting fire-burned or beetle killed areas on strategic sites.

Acknowledgements

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Survey Costs

The March 2023 recruitment survey cost was $17468.27 ($873.41 GST), at a dry rate (not including fuel) of $1350/hours. The total flight time was 12.0 hours.

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