



SUBMISSION TO THE

NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information:

Decision: X

Issue: Baffin Island Caribou Total Allowable Harvest

Background:

- The first island-wide survey of Baffin Island caribou occurred in March 2014, and the results indicated there were very few caribou on Baffin Island. The population was estimated to be 4,652 caribou (3,462–6,250). The current total allowable harvest (TAH) is 250 caribou, including up to 25 females.
- To balance harvesting pressure, the GN has recommended that the Qikiqtaaluk Wildlife Board (QWB) allocate tags in proportion to the number of caribou in an area based on the 2014 abundance estimate and composition survey findings.
- In the absence of telemetry data, the next abundance survey for Baffin is a large undertaking and significant funds are required to complete such a survey making such a survey difficult to schedule with competing wildlife research priorities across Nunavut.
- The Government of Nunavut (GN) Department of Environment (DOE) has been working with Hunters and Trapper Organizations (HTOs) to identify methods to reduce the overall survey area required for the next Baffin survey and to understand Baffin caribou regional movements. During these discussions, the use of collaring was identified as an effective method in which the distribution of caribou and their movements between different regions across Baffin could be observed and used to reduce survey study area size and cost.
- A regional approach to abundance surveys, based on telemetry (collaring), is a more cost-effective, precise, and sustainable approach requiring the monitoring of caribou movements up to and during regional survey efforts.
 - The existence of spatially separated and geographically distinct subpopulations of caribou on Baffin Island is suggested by both Inuit Qaujimagatuqangit (IQ) and past scientific analyses. We have yet to find clear genetic differences in caribou across Baffin Island.
 - A regional survey area (example: North Baffin, South Baffin, Central Baffin, etc.) will allow more frequent abundance surveys due to substantially reduced costs and lower risk of incompleteness than an island-wide survey.
- The DOE planned to expand the GPS satellite telemetry caribou collaring program in the spring of 2022. The DOE received an email from the QWB a few days before the program was set to begin requesting the program be cancelled expressing unanimous opposition from Baffin Island HTOs based on perceived risks of spreading COVID-19 to caribou.

- The DOE has completed caribou composition surveys each year since 2015, excluding 2020, and reports have been distributed to co-management partners.
- Communities have expressed concern over illegal harvesting of caribou on Baffin Island resulting in a harvest greater than the Total Allowable Harvest (TAH). This has an unknown impact on the recovery of Baffin caribou. The extent of illegal harvesting could greatly impact the determination of the sustainable harvest level, possibly prolonging herd recovery. All illegal harvesting is investigated when reported to the DOE Operations Section.

Current Status:

- Results from 2015-2021 composition surveys suggest good productivity and a potentially increasing population trend in some areas, particularly in regions of South Baffin (Figures 1-5). Hall Peninsula and Meta Incognita Peninsula (Figures 1 and 2) showed indices of high productivity and increasing minimum counts, suggesting an increasing trend.
- Composition surveys were completed between March 19, 2022 and April 8, 2022 in South Baffin. Approximately 70 hours of helicopter flights were completed during this period. Results are currently being analyzed and the final report will be distributed to all co-management partners in summer 2022. Preliminary minimum counts have been included in this submission and suggest a continued increasing trend in some parts of Baffin Island (Figures 1 and 2).
- Increase in productivity and minimum counts were recorded within the Meta Incognita Peninsula strata, and Hall Peninsula within South Baffin regional strata.
- Similar positive indicators of increasing abundance of South Baffin caribou have been reported by hunters from South Baffin, who are starting to see more caribou closer to communities.
- There have been minimal reports of wolves on Baffin Island and no observation of wolves during composition surveys since a single wolf was observed in North Baffin in 2017. This low number of predators on Baffin Island is likely aiding in the observed increases in abundance due to reduced calf and adult mortality.
- Without a current abundance survey the DOE is unable to quantify any changes in island-wide abundance that may be occurring, but the DOE notes that there are positive signs of population growth being identified by composition surveys and observations of increased caribou numbers by communities, particularly in South Baffin.
- The DOE believes that based on these positive signs a conservative increase to the TAH represents a low risk to Baffin Island caribou population sustainability.
- There are risks associated with increasing the harvest including unquantified illegal harvest, unconfirmed movement patterns between regional areas (composition survey areas), seasonal variation in productivity, disease, and unknown adult survival rates. However, with appropriate management tools including abundance surveys and associated telemetry program, and continued composition surveys, the GN believes the risk of a small harvest increase may be sustainable.

Consultation:

- DOE planned in-person consultations for September 2021. At the request of the co-management partners due to lack of available accommodations these consultations were postponed. Consultations were also planned for early January 2022 but were postponed due to travel restrictions associated with COVID-19.

- The DOE planned consultations by teleconference on February 1 and 2, 2022 to receive feedback from HTOs prior to the NWMB February 2022 submission deadline. The DOE received a request from QWB on January 28, 2022, to postpone the teleconference consultations until later in February; the DOE agreed to the QWB request for a delay.
- The Baffin Regional Biologist and Technician completed consultations by teleconference with members of North Baffin HTOs on February 15, 2022, and South Baffin HTOs on February 16, 2022. Nunavut Tunngavik Incorporated (NTI), Qikiqtaaluk Wildlife Board (QWB) and Nunavut Wildlife Management Board (NWMB) were invited to the meetings as observers and given an opportunity to address concerns at the end of the meetings after HTOs had completed providing input and asking questions.
- A consultation summary report has been provided to the NWMB for their regular meeting (RM002-2022) in June 2022.

Recommendations:

- The GN advises a cautionary approach to increasing the harvest as any increase may negatively impact recovery of Baffin Island caribou in some regions.
- Based on the observed increase in abundance by communities, positive trends in productivity identified through calf:cow ratios between 2015 and 2021, and positive increases in minimum counts in some areas over the same period, and low numbers of predators, the Department of Environment is recommending a conservative increase to the TAH.
- Based on current scientific information, a conservative increase of 30 male only caribou (representing a new Total Allowable Harvest of 280 caribou, and up to 25 females) would represent an acceptable low risk to this herd's sustainability.
- The GN has taken into consideration the technical advice and all available IQ. In the interests of our collaborative efforts in wildlife co-management, we recognize, support and recommend that the NWMB accept the proposal made by the QWB during the February 2022 Consultation, of an annual TAH increase of 50 tags per year whereby each year the increase is reconsidered based on new IQ and scientific information.
- The GN further recommends that the QWB allocate these proposed increases to areas showing demonstrated positive trends in abundance indices.
- The GN recommends the additional 50 tags be made up of 25 male and 25 female caribou.
- Due to the risks associated with these increases, the GN commits to meeting face to face with Baffin communities annually and as required, to develop a strategic research plan to quantitatively assess regional abundance of Baffin Island caribou to ensure that any negative impacts to Baffin Island caribou recovery can be identified and actioned quickly.
- These recommendations are being proposed with a known higher level of risk that could negatively impact and prolong recovery. The GN would like to request the unanimous support of the Board and co-management partners for increased research and increased harvest monitoring during the herd recovery.

- The GN also requests the QWB and HTOs to work with our Conservation Officers to address concerns of illegal harvesting to support the long-term sustainability of this caribou herd.

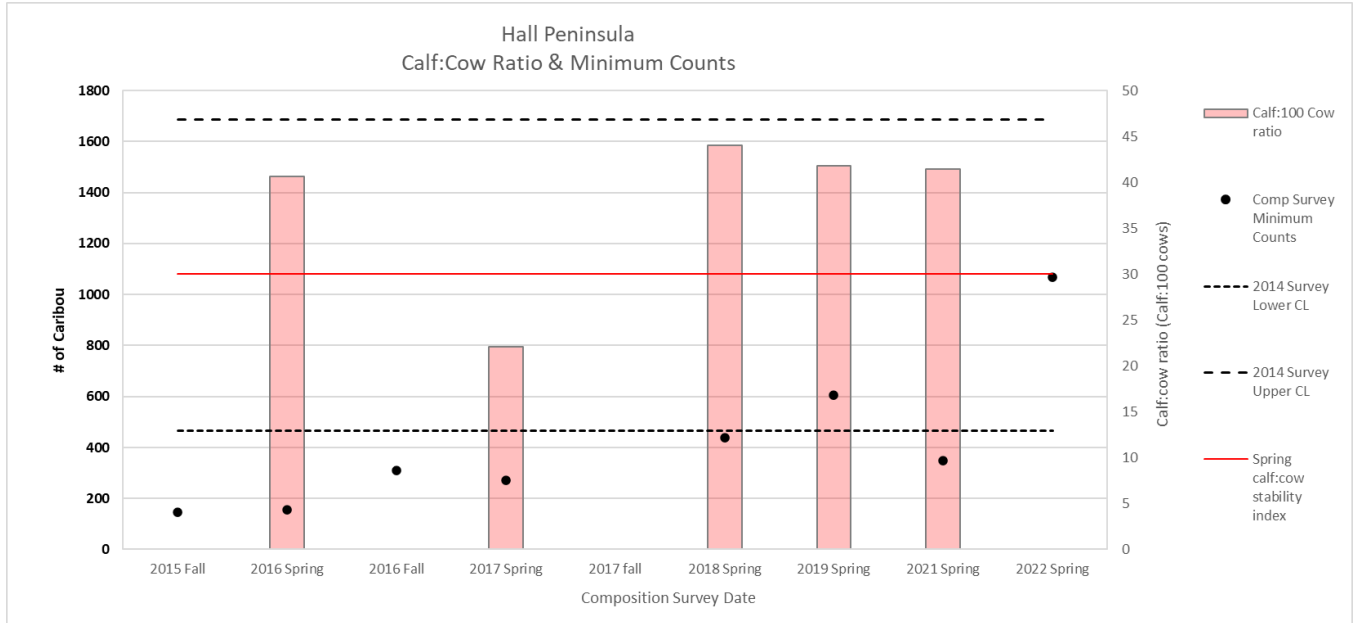


Figure 1. Hall Peninsula, as stratified in the 2014 Baffin Island abundance survey, spring calf:100 cow ratio 2015-2021 (right vertical axis, grey fill) and composition survey minimum counts (left vertical axis, black fill). *2022 spring minimum counts are preliminary.

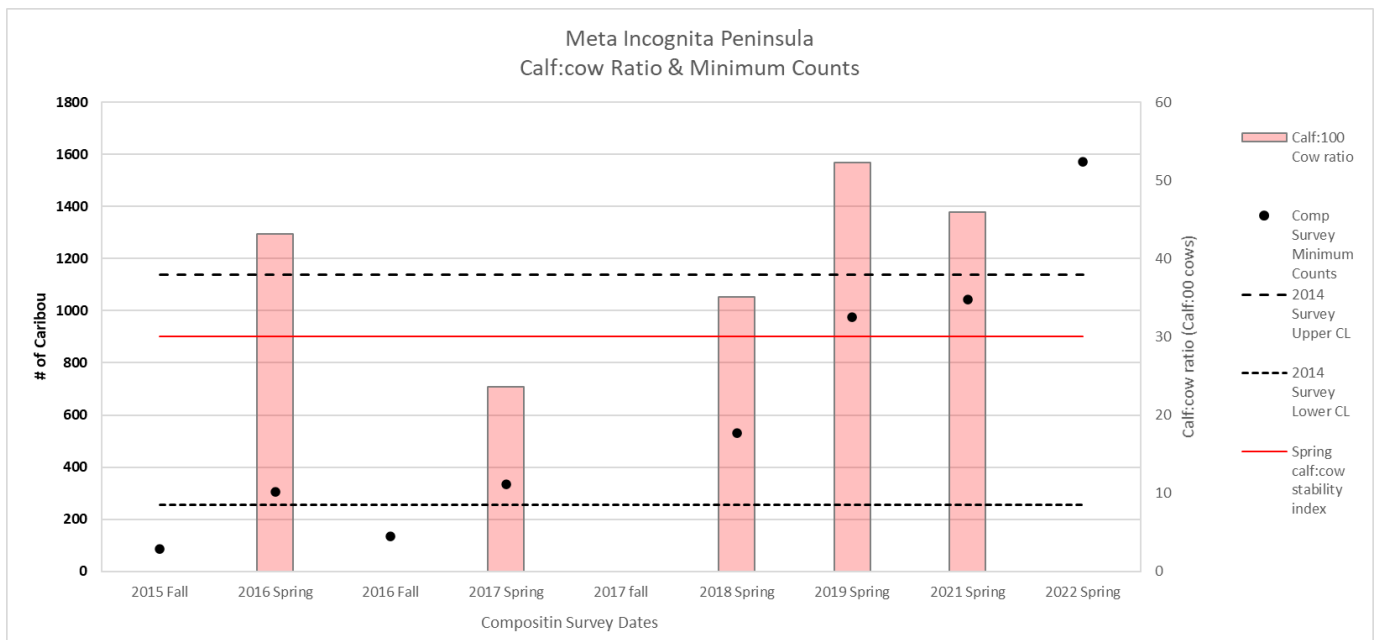


Figure 2 Meta Incognita Peninsula, as stratified in the 2014 Baffin Island abundance survey, spring calf:100 cow ratio 2015-2021 (right vertical axis, grey fill) and composition survey minimum counts (left vertical axis, black fill). *2022 spring minimum counts are preliminary.

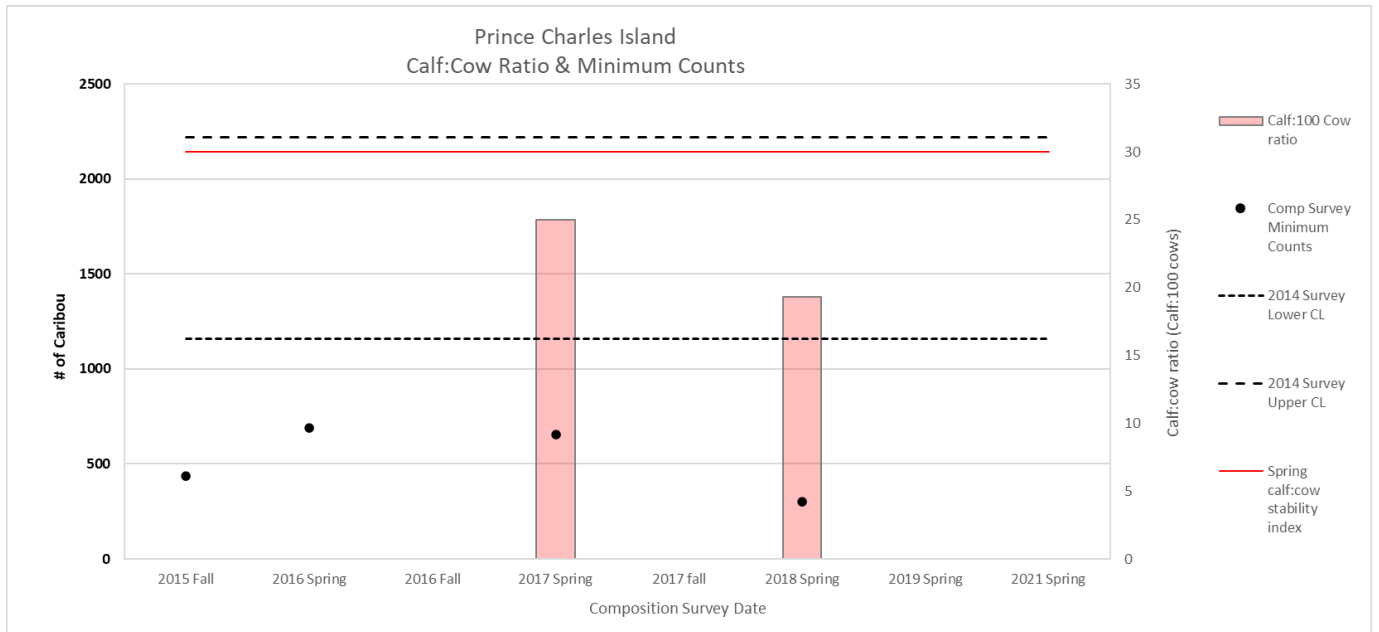


Figure 3 Prince Charles Island, as stratified in the 2014 Baffin Island abundance survey, spring calf:100 cow ratio 2015-2021 (right vertical axis, grey fill) and composition survey minimum counts (left vertical axis, black fill).

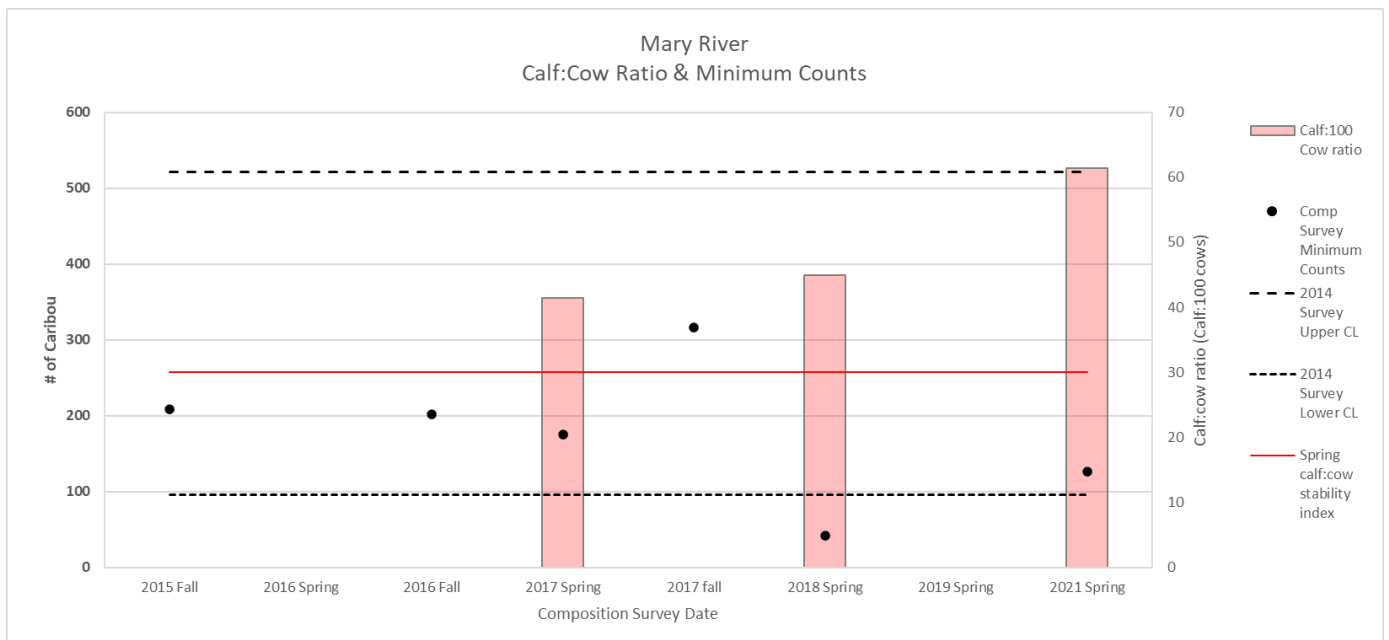


Figure 4 Mary River, as stratified in the 2014 Baffin Island abundance survey, spring calf:100 cow ratio 2015-2021 (right vertical axis, grey fill) and composition survey minimum counts (left vertical axis, black fill).

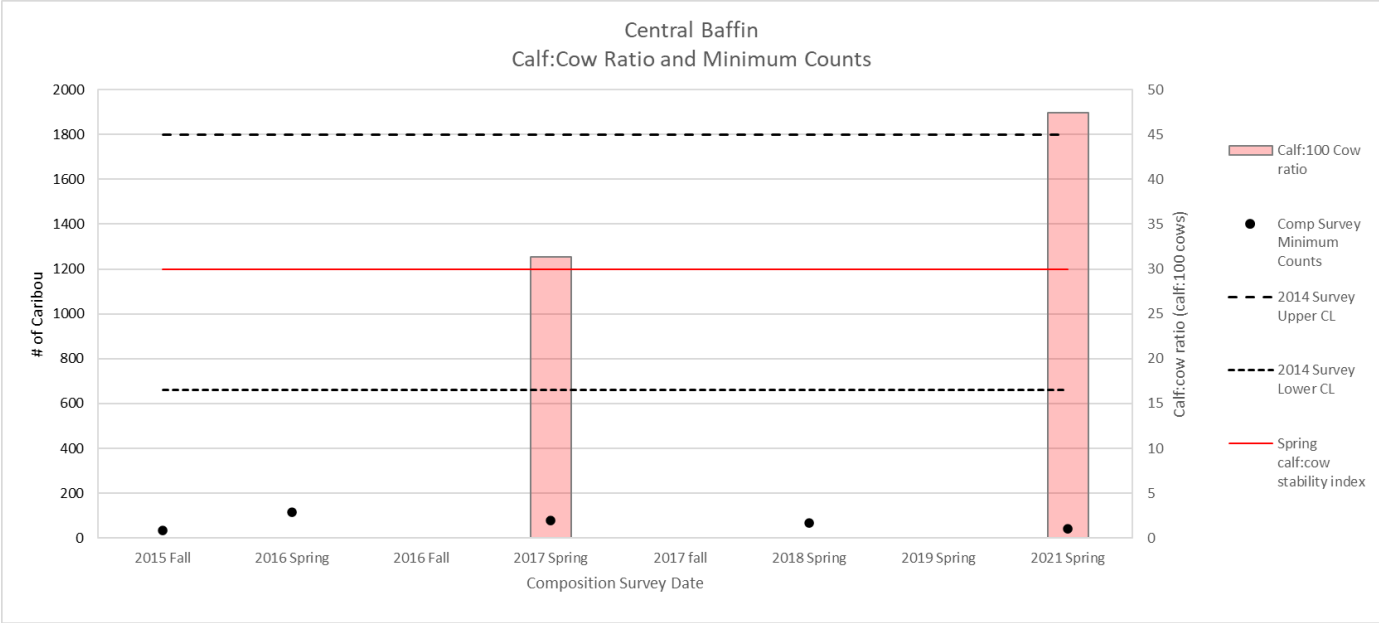


Figure 5 Central Baffin, as stratified in the 2014 Baffin Island abundance survey, spring calf:100 cow ratio 2015-2021 (right vertical axis, grey fill) and composition survey minimum counts (left vertical axis, black fill).

SUBMISSION TO THE
NUNAVUT WILDLIFE MANAGEMENT BOARD (NWMB)

Regular Meeting No. RM 002-2022

FOR

Information:

Decision:

Issue: *Proposed 10-Year Program to Increase the Total Allowable Harvest (TAH) for Baffin Island Caribou (BIC), 2022-2032*

Background:

Assertion of Primacy of Inuit Systems of Wildlife Management in Decisions in Nunavut

In December 2020, the Qikiqtaaluk Wildlife Board (QWB) adopted the position to assert that the Nunavut Agreement, a constitutionally protected treaty between the Inuit of Nunavut and the Crown of Canada, provides primacy to Inuit Systems of Wildlife Management with respect to decision-making processes and outcomes regarding wildlife and wildlife harvesting by Inuit. This primacy extends to Inuit Qaujimagatuqangit (IQ) because IQ is the basis for Inuit Systems of Wildlife Management. In this context, “primacy” refers to what comes first and remains most important. Inuit Systems of Wildlife Management are specifically recognized in sub-section 5.1.2(e) of the Nunavut Agreement. Other sections of Article 5 of the Nunavut Agreement point out the special rights and effective roles that Inuit have in wildlife management and harvesting in Nunavut. Science and scientific wildlife management are not mentioned in Article 5 of the Nunavut Agreement. The QWB asserts that any wildlife management plan, recommendation, decision or other measure established or implemented regarding caribou or other wildlife in Qikiqtaaluk Region needs give primacy to Inuit rights, Inuit Systems of Wildlife Management, and Inuit Qaujimagatuqangit. This view is supported by both the Nunavut Agreement and the United Nations Declaration on the Rights of Indigenous Peoples.

Inuit System of Long-term Management of Caribou on Baffin Island

Since time immemorial, Inuit on Qikiqtaaluk (i.e., Baffin Island and nearby islands) have known about and managed the long-term population caribou cycles that occur over the lifetime of an elder, or about 70-90 years. Children are taught by elders that if there are many caribou in their young years, there will be very few caribou when they have children of their own to feed, but if they live to become elders, there will be many caribou again. Inuit know and recognize many more specific signs of shorter-term changes that predict how the caribou population will change in local areas and across the island in the near future throughout the 70-90-year cycles.

During each phase of the long-term cycle, Inuit have harvest management strategies that are stated very simply, but include a huge amount of knowledge and deep understanding of the factors and processes that cause, regulate and affect each phase. For example:

“Snow is no problem unless there have been too many caribou for too long.”

This statement reflects Inuit understanding that the amount of lichen food for caribou in winter is a major factor in the growth and decline phases of caribou populations on Qikiqtaaluk, and that over time, caribou can deplete their lichen food resources when there has been “too many caribou for too long”. Lichens have no roots and grow very slowly. If caribou find ample lichen after digging through snow, they can maintain their strength and dig through deep, hard snow. If they do not find ample lichen, they become weaker, cannot get enough food, move to other areas, feed in riskier areas like cliff faces, become more susceptible to wolf predation, and produce fewer calves that may not survive, resulting in gradual but dramatic declines in abundance and distribution over about 15 years in one phase of the cycle. When there have been “too many caribou for too long” and while lichen food resources have not yet recovered, males can be important for the entire population because, with their heavier and stronger bodies, they may break through hard surface snow and sometimes ice when digging craters for feeding. Thereby, males can enable females and calves to expand the craters started, so they too can access more food during winter.

The decline phases of the long-term cycles are all very normal and predictable for Qikiqtaaluk caribou. In the late 1990s and early 2000s after decades of too-many caribou, Inuit across Qikiqtaaluk started to see signs of impending decline, and predicted the next great decline phase of the long-term cycle.

The QWB and southern Qikiqtaaluk HTOs called for an IQ-based management plan for the decline phase expected by Inuit during 2005 – 2020. Based on Inuit Qaujimajatuqangit and elders’ predictions, the plan was developed but not implemented. The QWB also called for development of a similar IQ-based plan for northern Qikiqtaaluk but this was not undertaken.

Based on Inuit Qaujimajatuqangit and Inuit observations of caribou in many areas, the long-term cycle has now entered a new critical phase that requires a major change from the current harvest management strategy that is being used by the GN because the depleted lichen food for caribou has not had time to replenish itself. Caribou have the potential to increase in abundance faster than depleted lichen can grow.

The GN has managed the caribou for immediate maximum population increases ever since 2015. By limiting harvesting to mainly males and a few females, the caribou may increase in some years, but they will potentially eat as much lichen food as grows each year but the lichen is already depleted. The GN’s strategy could keep the caribou’s food in an over-eaten, depleted condition for many years, perhaps perpetually depleted so that the abundant Qikiqtaaluk caribou population of the 1970s – 2000s may not return.

In the 1950s and 1960s, Inuit intentionally managed caribou using a very different strategy, one that applies again today! Even though there were few caribou in the 1950s, Inuit elders knew that:

“We had to keep harvesting the caribou. The land needed to rest.”

In the 1950s and 1960s, important Inuit elders knew that there had been “*too many caribou for too long*” in previous decades, and caribou abundance declined, as Inuit had predicted in the 1930s and 1940s because they did not have enough lichen to eat. They knew that “*the land had to rest*” with a low abundance of caribou maintained by Inuit for one or two decades in the 1950s and 1960s. That harvest strategy allowed the caribou’s slow-growing winter food,

lichen, to recover in large amounts over large areas again, so it could support great abundances of caribou seen in later decades.

The great abundance of caribou on Qikiqtaaluk from about 1970 to the early 2000s was not an unexplainable accident. It occurred because of the Inuit System of Caribou Management, intentional harvesting by Inuit near local communities, camps and elsewhere during previous decades.

This Inuit System of caribou management, based on Inuit Qaujimagatuqangit, must be enabled and implemented again today over the next 10-20 years, so that the critical food of caribou, lichen, may recover to sufficient quantities to support the next great abundance of Qikiqtaaluk caribou. Consistent with all of the principles of conservation in the Nunavut Agreement, this Inuit System will:

- Maintain the natural balance of lichen-caribou-Inuit ecological system that has existed since time immemorial
- Protect caribou winter habitats
- Maintain a vital, healthy caribou population capable of sustaining Inuit harvesting into future decades
- Restore and revitalize a depleted population of caribou and their habitat over the long term.

Consultation:

After consultations with the HTOs, in 2018, 2019 and 2020 the QWB proposed modest increases in the 2015 Total Allowable Harvest (TAH) for Baffin Island caribou. The NWMB did not approve any of these requests, although a minor adjustment in the harvest of females was allowed in 2020.

The 2021 Annual General Meeting of the QWB discussed the above IQ and the Inuit System of Baffin Island caribou management, with advice and input from staff of NTI. Most HTO delegates recommended that, as soon as possible, the allocations for their communities should double and possibly more. That would require an increase in the TAH from 250 to 500 in one year.

The QWB Executive subsequently approved a more modest, longer-term proposal that remains consistent with the Inuit System of caribou management based on:

“The land needs to rest.”

Recommendation:

The QWB Executive recommends to the Nunavut Wildlife Management Board (NWMB) that the NWMB approves and implements the following Inuit System of caribou harvest management on Baffin Island starting on July 1, 2022:

1. a) An initial increase of the Total Allowable Harvest (TAH) for Baffin Island caribou of 100 on July 1, 2022 for a total of 350 caribou;

- b) A second increase of the TAH for Baffin Island caribou of 75 on July 1, 2023 for a total of 425 caribou;
 - c) Then subsequent annual increases of the TAH for Baffin Island caribou of 50 in each of the next 8 years to reach a total of 825 on July 1, 2031.
2. Adjust the Non-Quota Limitation until the maximum harvest of females will be about 50% females of the annual TAH by July 1, 2031, in the following way:
- a) On July 1, 2022, the increase of the TAH will be composed of a maximum of 50 females for a total of up to 75 females;
 - b) On July 1, 2023, the increase of the TAH will be composed of a maximum of 40 females for a total of up to 115 females; and
 - c) Then annually until July 1, 2031, the increase in the TAH will be composed of a maximum of 37 females until a total of 411 females may be harvested during the harvest year 2031-2032.
3. Until at least June 30, 2032, the Basic Needs Level for Inuit will equal the entire annual TAH.
4. The QWB will reassess the schedule of increases in the TAH after five years (in 2027) to determine if subsequent annual TAH and NQL increases should change, based on all available information. The GN will be consulted in this reassessment process. If a change in the subsequent TAHs and NQLs is warranted, the QWB will make a proposal to the NWMB for any recommended changes.
5. The QWB will base annual HTO allocations on the following factors:
- a) previous three-year average harvest for each community,
 - b) less any over-allocation harvesting,
 - c) plus a portion of the next year's annual TAH increase and any under-harvest of the TAH,
 - d) and any other adjustments that the QWB Executive determines to be appropriate.
6. To assess the success and sustainability of this Inuit System, the QWB and HTOs will undertake the following:
- a) Each year by about June 30, each HTO Board will inform the QWB Director of Wildlife as to whether the abundance and distribution of caribou in their area have been increasing, stable or decreasing during the previous year.
 - b) The combined information from all 10 HTOs will be assessed annually by the QWB Executive to help determine if the method for allocating the TAH should be continued or modified.
 - c) The QWB and HTOs will undertake additional annual non-invasive science- and IQ-based community monitoring of caribou winter distributions and abundances.
 - d) The QWB and HTOs will initiate monitoring of caribou-lichen food resources, similar to methods used by reindeer herders in Alaska, as soon as possible.

- e) The QWB and HTOs may use additional monitoring methods (e.g., snow distributions and conditions) as needed and available.
- 7. During 2031-2032, the QWB will assess whether or not the TAH may be eliminated on July 1, 2032, or if the TAH and NQL changes should be continued or modified in future, based on all available information. The GN will be consulted during this assessment process. The QWB will make a proposal to the NWMB for any recommended changes.

Prepared by: Michael Ferguson and Kolola Pitsiulak, Qikiqtaaluk Wildlife Board

Date: May 6, 2022

Executive Summary

Government of Nunavut (GN), Department of Environment (DOE) representatives conducted consultations with Hunters and Trappers Organizations/Associations (HTOs) in the Baffin region with north and south Baffin communities, on February 15 and February 16, 2022, respectively.

The intent of this round of consultations was to ensure HTOs were informed on the results of caribou composition surveys from 2021 as well as the Harvest Health Monitoring program on Baffin Island. DOE presented upcoming research programs including a telemetry-based collaring program, continued composition surveys, continued health monitoring and a discussion on Total Allowable Harvest and community observations. DOE solicited input from the HTOs and co-management partners regarding potential changes to the current TAH and non-quota limitations. The feedback collected during this round of consultations will aid the GN in future research planning and monitoring for Baffin Island caribou as well as any potential recommendations to the Nunavut Wildlife Management Board (NWMB) for changes to the harvest of Baffin Island caribou.

This report attempts to summarize the comments made by participants during the consultations.

Preface

This report represents the Department of Environment's best efforts to accurately capture all of the information that was shared during consultation meetings with the Hunters and Trappers Organizations of Kimmirut, Qikiqtarjuaq, Pangnirtung, Iqaluit, Kinngait, Sanirajak, Igloolik, Arctic Bay, Pond Inlet and Clyde River.

The views expressed herein do not necessarily reflect those of the Department of Environment, or the Government of Nunavut.

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Report Purpose and Structure

This report is intended to collate and summarize comments, questions, concerns and suggestions provided by the HTOs in response to the presentation (Appendix).

The following communities and organizations were consulted on February 15th and 16th, 2022.

- Arctic Bay, Ikajutit HTO, February 15, 2022
- Clyde River, Nangmautuaq HTO, February 15, 2022
- Igloodik, Igloodik HTO, February 15, 2022
- Pond Inlet, Mittimatalik HTO, February 15, 2022
- Sanirajak, Hall Beach HTA, February 15, 2022
- Iqaluit, Amaruq HTO, February 16, 2022
- Kinngait, Aiviq HTO, February 16, 2022
- Kimmirut, Mayukalik HTA, February 16, 2022
- Pangnirtung, Pangnirtung HTA, February 16, 2022
- Qikiqtarjuaq, Nattivak HTA, February 16, 2022

Representatives from the DOE, the Nunavut Wildlife Management Board (NWMB), Nunavut Tunngavik Inc. (NTI), and the Qikiqtaaluk Wildlife Board (QWB) attended each of the consultations.

Purpose of Consultations

In order to make up for multiple postponed in-person consultations over the past two years, the DOE, as represented by John Ringrose, Baffin Regional Wildlife Biologist, and Christopher Mutch, Baffin Regional Wildlife Technician, arranged two separate but similar meetings on February 15 and 16, 2022. The co-management organizations; NWMB, NTI, and QWB were also invited to attend on both days as observers. The purpose of these meetings was to allow the DOE to present the results of the previous years research programs to the Baffin HTOs, answer any questions about the results and seek input from the HTOs regarding proposed research for Fiscal 2022-2023. HTOs were asked to provide recent observations of any changes in abundance in their respective hunting areas and how this may relate to increased harvest opportunities for the communities. The DOE intends to use this input in combination with existing scientific data in designing any future submissions to the NWMB regarding changes to the TAH for Baffin Island caribou. All HTOs attended and all co-management partners were represented during these meetings.

Format of the Meeting

The meetings were held virtually via Microsoft Teams and tele-conference during the days of February 15th and 16th, 2022 (see agenda below). Baffin Regional Wildlife Biologist, John Ringrose, and Baffin Regional Wildlife Technician Christopher Mutch co-chaired the meeting. John led the presentation and Christopher took the minutes. Lack of HTO representation on the morning of February 15th led to postponement until 1pm that afternoon. HTOs had previously confirmed their intent to participate. A power outage in Iqaluit briefly interrupted the meeting on the afternoon of February 15th for approximately 20 minutes as NWMB, NTI and the Iqaluit based interpreter (Innirvik Support Services Ltd.) were all disconnected until the power was restored. Each consultation started with the presentation of results from the past years research programs including health monitoring, composition surveys and collaring in North Baffin. The presentation

then focused on upcoming research that was occurring in the 2021/2022 fiscal year and proposed additional caribou collaring in central Baffin.

The HTOs were then invited to ask all questions, raise concerns, or provide advice.

After the HTOs had exhausted all questions the presentation continued with the discussion of Total Allowable Harvest (TAH) and once again invited comments, observations, questions and advice from HTOs.

After the presentations, questions/discussion continued until no further questions were raised by HTOs. Following the HTOs questions and comments, the co-management partners were provided any remaining time to respond to any questions or comment on the presentation. All organizations accepted the opportunity to participate.

Meeting Agenda

February 15, 2022

8:45 am	Settle in
9:00 am	Opening Prayer, introductions
9:10 am	GN Research Presentation- updates from last year
10:00 am	Health Break
10:15	GN presentations-Upcoming research
11:00	HTO Input- Clyde River, Pond Inlet, Arctic Bay, Igloolik, Sanirajak
12:00 pm	Lunch Break
1:00 pm	GN Presentation-Support needed
1:30 pm	GN presentation- Harvest update/TAH discussion
3:00 pm	Health Break
3:15pm	HTO Input- Sanirajak, Igloolik, Arctic Bay, Pond Inlet, Clyde River
4:45 pm	Co-management partner comments/questions. **Time permitting"
5:00 pm	Wrap up

*Morning was postponed until 1pm due to lack of HTO representation.

February 16, 2022

8:45 am	Settle in
9:00 am	Opening Prayer, introductions
9:10 am	GN Research Presentation- updates from last year
10:00 am	Health Break
10:15	GN presentations-Upcoming research
11:00	HTO Input- Qikiqtarjuaq, Pangnirtung, Kimmirut, Iqaluit, Kinngait
12:00 pm	Lunch Break
1:00 pm	GN Presentation-Support needed
1:30 pm	GN presentation- Harvest update/TAH discussion
3:00 pm	Health Break
3:15pm	HTO Input- Kinngait, Iqaluit, Kimmirut, Pangnirtung, Qikiqtarjuaq
4:45 pm	Co-management partner comments/questions. **Time permitting**
5:00 pm	Wrap up

Summary by Community

February 15th – North Baffin

The North Baffin meeting was scheduled to begin at 9:00 am but by 9:45am, Nangmoutaq HTO (Clyde River) was the only HTO represented on the call. A representative from Hall Beach Hunters and Trappers Association (Sanirajak) attempted to join the call but was unsuccessful. Due to the lack of representation, it was decided by all parties to postpone the start of the meeting until 1pm.

At 1:20 pm the meeting began with all HTOs and co-management partners present. The GN presented the results of the North and South Baffin Composition survey, Harvest Health Monitoring and North Baffin Collaring. There were very few questions regarding the results of the previous work that was completed. The focus of the feedback from the North Baffin communities was very pro-research. The majority of suggestions from HTOs were focused on how to continue or expand the work we are currently doing but also find ways to lessen the impacts or disturbance to the caribou. There was a lot of support for the use of drone technology or snowmobiles during surveys to mitigate the disturbance and impacts on caribou. While HTOs were very supportive of the completed and proposed research, there were suggestions from NWMB to revisit animal handling procedures to better align with cultural values. The following is a brief description of each HTOs' input. This summary does not include every comment made but serves as a synopsis of the discussion.

Hall Beach HTA (HBHTA)

- Expressed concern about the unregulated harvest of Wager Bay caribou, specifically on the Melville Peninsula by hunters from Arctic Bay and Pond Inlet.
- Requested abundance survey of the Melville peninsula with direct input from Igloodik and HBHTA in the planning, implementation and reporting.

Igloodik HTA

- Concern about the low numbers of caribou on the Melville Peninsula.
- Very interested in the collar data and what we will learn from it.
- Would like to see more transparency in the research process, more communication and more community involvement.
- Expressed support for collaring but wanted to make sure that we share the data in a responsible way to protect the caribou from hunters unfairly targeting the caribou's known locations.
- One representative said; "It makes it easier to harvest caribou when you should be actively looking for them. Instead of going on a computer and finding where they are. It makes it too easy. This data should be shared but it should be shared with care, that you don't give out all the information where the caribou are for the caribou's sake."

Ikajutit HTO

- Would like to have some survey work in their area.
- Very interested in using drones to minimize the disturbance of caribou during surveys.
- Would like to see greater exchange of information between organizations.

Mittimatalik HTO

- In recent years there were very caribou near the community and no bulls. When the numbers are low the bulls are hard to find. Now they are starting to see the bulls return to the area.
- They would also like to see surveys designed to minimize the disturbance of caribou.
- The use of snowmobiles was suggested, and they support Ikajutit HTO's suggested use of drones.

Nangmoutaq HTO

- Would like to see more work done in their area.
- Supports collaring.
- Supports the use of drones and snowmobiles for surveys.
- Supports collaring as a tool to build towards the next abundance survey.

After all HTOs had a chance to ask all of their questions and provide as much input as they desired, the co-management partners were given the floor.

NTI

- Repeatedly expressed concern that caribou abundance on Baffin Island is very low.
- Expressed concerned about the negative impacts of collaring when population is low.
- Expressed concern about creating smaller management zones and the hypothetical imposition of a moratorium by the GN.
- Expressed a desire to an "Inuit only" meeting with all present parties except the GN and NWMB.

QWB

- Expressed concern regarding possible transmission of COVID-19 from humans to caribou during proposed collaring program in South Baffin.
- Echoed NTI's concerns regarding smaller management zones and a hypothetical moratorium.
- Also expressed a desire to have an "Inuit only" meeting that didn't include the GN to discuss the presentation.

NWMB

- Suggested that the GN revisit animal handling procedures to better align with Inuit cultural values.
- Suggested that the GN could better incorporate traditional knowledge and Inuit Qaujimagatugangit (IQ) in the design and execution of research programs by working with Inuit groups to develop defined procedures for the collection and implementation of IQ.

February 16th – South Baffin

The South Baffin meeting had all HTOs present in the morning and began at 9:30am. All co-management partners were represented when NTI joined the meeting at 9:40am. The GN presented the same material as on February 15th and solicited the HTOs for feedback and input. Multiple HTOs expressed internal capacity issues in response to their ability to monitor the harvest and assist in GN research programs. There was an obvious spirit of collaboration between HTOs and co-management partners with multiple HTOs commenting in support of statements made by other HTOs.

Nattivak HTA

- Requested the areas between Qikiqtarjuaq and Pangnirtung and Qikiqtarjuaq and Clyde River to be surveyed.
- Requested that any TAH changes be made sooner than later.

Pangnirtung HTA

- Concerned that South Baffin is recovering faster than North Baffin.
- Would like to see separate management zones so that South Baffin can have more tags now and not be bound to the recovery in North Baffin.
- Supports Nattivak's request for a survey between the two communities.
- One representative said; "If we just count South Baffin caribou can we have more tags in South Baffin. If we were on our own could we increase the quota for South Baffin only?".
- Although previously unsupportive of collaring programs due to community concerns, the board has committed to revisiting the program with their membership.

Mayukalik HTA

- Would like twice as many tags (+35).
- Reported seeing more caribou close to town, but less on the trail to Iqaluit.
- Would like more survey work towards Resolution Island.
- Community filled its quota in 8 hours this year.

- One representative said; "...feels there are lots of caribou near the points of these areas (near Resolution Island) where there is less hunting".
- Expressed concerns about obtaining caribou meat either through the harvest or by purchasing.
- One representative said; "It's hard to get caribou even to order it. Its hard to find caribou meat, even purchasing from other regions. Its hard even for the other regions to deliver on purchasing caribou meat too. Hard to get caribou meat all around."

Amaruq HTO

- Stated that managing the harvest is very difficult and takes a lot of effort.
- Approximately 2000 members and only 43 tags.
- Would like to see any increase but feel double the quota (+43) would be a good start in Iqaluit.
- Would like to challenge the GN legally for the sole responsibility to manage caribou allocations.

Aiviq HTO

- Very adamant that they need a new Conservation Officer in Kinngait.
- Would like to see their TAH doubled (+25).
- One representative stated; "The system that we have now people don't share. Only the people in the household are eating the catch. The system we have there isn't enough caribou meat to share."
- Expressed concern that managing their own harvest puts the HTO board members in the public spotlight and open to criticism from their membership.
- A representative said; "Some members follow the rules, and some don't".
- Without a Conservation Officer in town, the board is forced to deliver the GN's programs without adequate support.

After all HTOs had a chance to ask all of their questions and provide as much input as they desired, the co-management partners were given the floor.

NWMB

- Responded to questions from HTOs about the regulatory submission process.

NTI

- Expressed concern about the handling of wildlife (i.e. collaring) and the potential spread of COVID-19 from humans to caribou.
- Expressed displeasure with the meetings format.
- Expressed the desire to have an "Inuit only" meeting after the conclusion of these meetings to discuss the material.

QWB

- Expressed similar concern as NTI regarding collaring during COVID-19 pandemic.
- Repeatedly expressed disapproval of the meetings format and repeatedly asked for more time to speak on behalf of the groups that were present in the meeting.

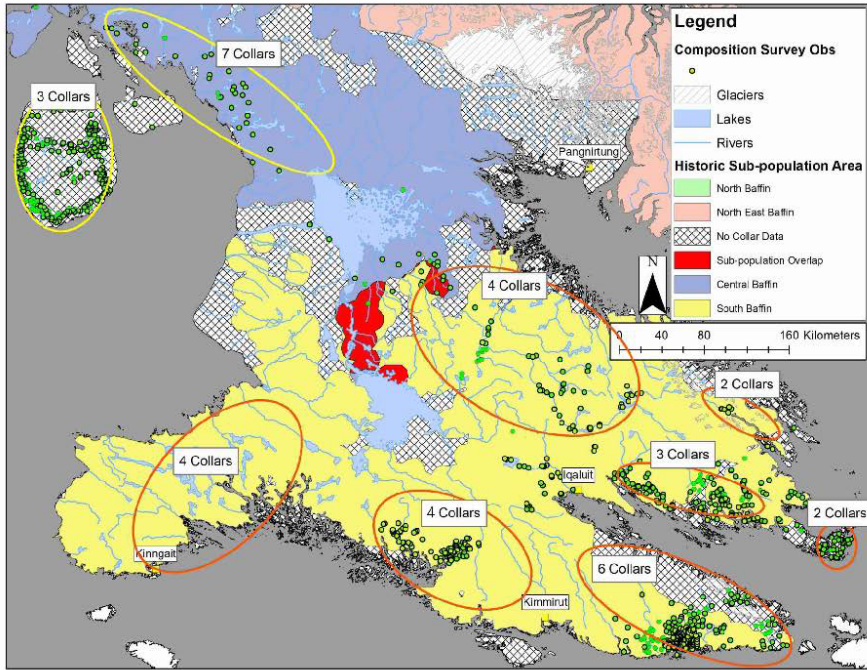
- Stated their legal position that; Inuit systems of wildlife management are the primary tool for wildlife management in Nunavut.
- QWB would like the TAH for Baffin Island to increase by 50 annually for the next 10 years to 750 in 2032.
- Repeatedly stated that the community allocations are derived from the basic needs level of each community and not based on the relative abundance of caribou around the community.

Conclusions

The main areas of concern or discussion from most HTOs during the meetings were focused on increased involvement in the GN research programs, methods to reduce impact on caribou from research and generally supportive of research. HTOs from South Baffin identified that community members were beginning to observe increased caribou numbers. These comments were expressed by Iqaluit, Kinngait and Kimmirut. In contrast the HTOs from North Baffin did not make similar statements.

Co-management partners identified the need to incorporate IQ into wildlife research programs including incorporating Inuit cultural values into wildlife handling protocols and issues with the amount of time provided during the meetings.

QWB and NTI raised concerns about handling of wildlife because of risks associated with COVID-19. HTOs did not raise these concerns during the meetings.



4) Planned research

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Collaring in South Baffin delayed until March/April 2022

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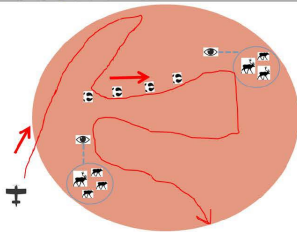
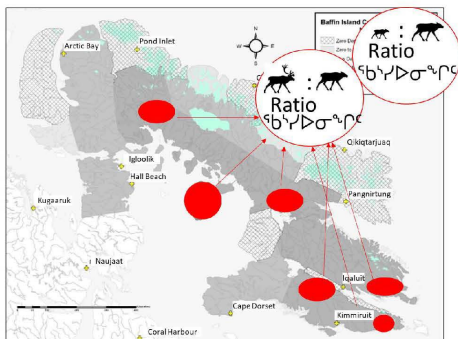
Include HTO participation

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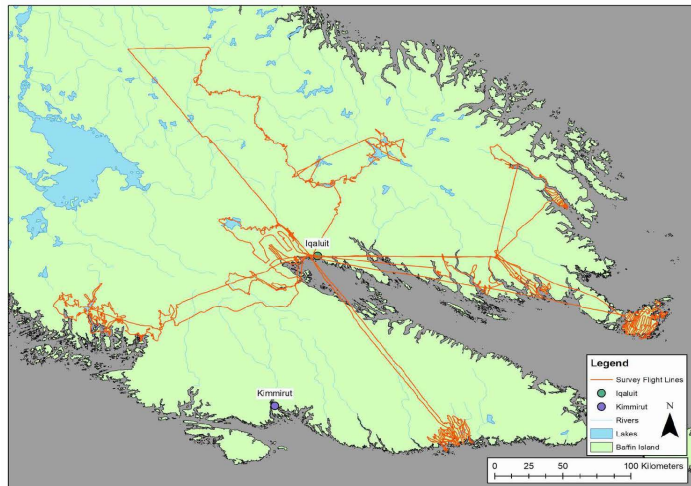
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4) Planned research ᖃᐅᐱᕐᓂᕐᓂᕐ ᐸᕐᓂᕐᓂᕐ



Composition Survey-South Baffin

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9) Discussion ᐅᑦᑲᑦᑲᑲᑲᑲᑲᑲ



17

Extra Information



18

How do we determine how many caribou there are?

2) Place lines on the island and fly along them

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ABUNDANCE**

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How do we determine how many caribou there are?

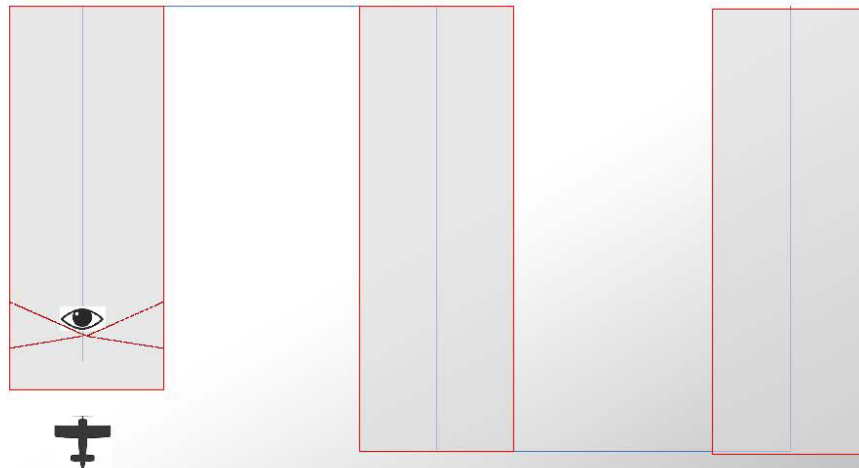
3) Look out the windows for caribou

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ABUNDANCE**

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22

Executive Summary

Barren-ground caribou (*Rangifer tarandus groenlandicus*) occur across Baffin Island and are distributed roughly into north, south and central groupings across Baffin, and ancillary Islands. Local hunters, trappers, and community members began to suspect a decline in the Baffin Island caribou population in the mid to late 1990s. In February and March of 2014, the Government of Nunavut, Department of Environment (DOE), conducted aerial surveys on Baffin Island, Melville Peninsula and surrounding islands, to estimate the number of caribou on Baffin Island. The 2014 survey effort estimated 4,652 (95%CI=3,462-6,250; SE=702.79; CV=0.15) adult and yearling caribou across Baffin Island and ancillary islands. This finding confirmed a major decline of caribou on Baffin Island from the estimates of caribou in the 1990s based on Inuit Qaujimagatuqangit.

The 2014 survey results and community-based observations led to the establishment of an eight-month moratorium beginning on January 1, 2015. Following a round of intensive consultations with all Baffin Island communities, and a letter submitted for decision to the NWMB, recommending the establishment of a TAH of caribou be established on Baffin Island, a decision was reached to establish a Total Allowable Harvest (TAH) of 250 male caribou.

Since the 2014 survey, the DOE has conducted fall and/or spring aerial composition surveys from 2015 to 2021 as a means to monitor productivity and relative densities of caribou across Baffin Island. The objectives of these monitoring indices were to:

- 1) Estimate the overall composition of the subpopulations including the north Baffin grouping, south Baffin grouping, and central Baffin grouping (Figure 1); i.e., what proportion of the population are young bulls, old bulls, cows, yearlings, and calves.
- 2) Estimate the trajectory of abundance of the three main groupings of the Baffin Island caribou population, based on demographic composition. Using spring composition results, determine through a comparison between fall composition results, and where possible, similar tundra-wintering barren-ground subpopulations, if an index of calf productivity (measured as calves per 100 cows) suggests an increasing or decreasing population trend.
- 3) Monitor the proportion of bulls in the population to ensure that the bull only harvest is not reducing bulls to a proportion that could interfere with breeding (rutting) success.
- 4) Build a database with which to estimate the current population trend through demographic modeling, utilizing all demographic composition data to project a trend from the 2014 population estimate.
- 5) Provide information for discussions regarding management actions (including TAH) and monitoring plans and intensity.

In the spring of 2021, we classified 1,734 and 192 caribou (bulls, cows, yearlings, and calves) in south and north Baffin Island, respectively. Calf:cow ratios for south Baffin varied from the lowest ratio of 41 calves:100 cows on Hall Peninsula to the highest ratio of 55 calves:100 cows on Loks Land, suggesting good productivity in south Baffin in the spring of 2021. The calf:cow ratio for north Baffin was 63 calves:100 cows. All regions combined or separated, produced ratios within or above the suggested 30 calves per 100 cow baseline for taiga-wintering populations. However, there is risk associated with using baseline values from taiga-wintering populations to identify population trend in tundra-wintering caribou.

Introduction

Baffin Island caribou are of the barren-ground subspecies, *Rangifer tarandus groenlandicus*. This subspecies can be further divided into two separate ecotypes: taiga wintering and tundra wintering. Baffin Island caribou generally remain on Baffin Island and ancillary Islands year-round and therefore are of the tundra wintering ecotype. Tundra wintering caribou generally occur in small groups and vary widely in their migratory behaviour. This can make surveying more difficult as the animals tend to be distributed unevenly across the landscape and occur in smaller groups than the taiga wintering ecotypes, particularly when their abundance is low.

There has been some scientific research conducted on Baffin Island caribou, however, many of these previous studies occur at relatively small spatial scales due to the remoteness and high cost associated with conducting research on Baffin Island. Fortunately, there is a wealth of Inuit Qaujimagatuqangit (IQ) that depicts the long-term population and distributional trends for the region. Due to the lack of quantitative data available, historical population estimates of caribou on the island are largely speculative. Telemetry studies (2008-2011) in North Baffin along with past survey findings, IQ studies (Ferguson, 1993; Ferguson and Gauthier, 1992; Ferguson and Messier, 1997; Ferguson et al 1998), and an island-wide collaring program from the late 80s to early 90s, point to the existence of potential sub-populations on the island (Figure 1). When all previous telemetry collar data was analyzed by Campbell et al. (2015) there is evidence that subpopulation structure exists on Baffin Island, but it has been determined that long-term spatial analysis is required to delineate subpopulations. Instead, spatial affiliations are referred to as “groupings” until further information is collected. Due to variation in habitat use and distribution at different population levels, further research is required to delineate specific groupings and/or subpopulations across Baffin Island. To aid in identifying the presence of these subpopulations, the DOE initiated a GPS telemetry program in North Baffin beginning in March 2021.

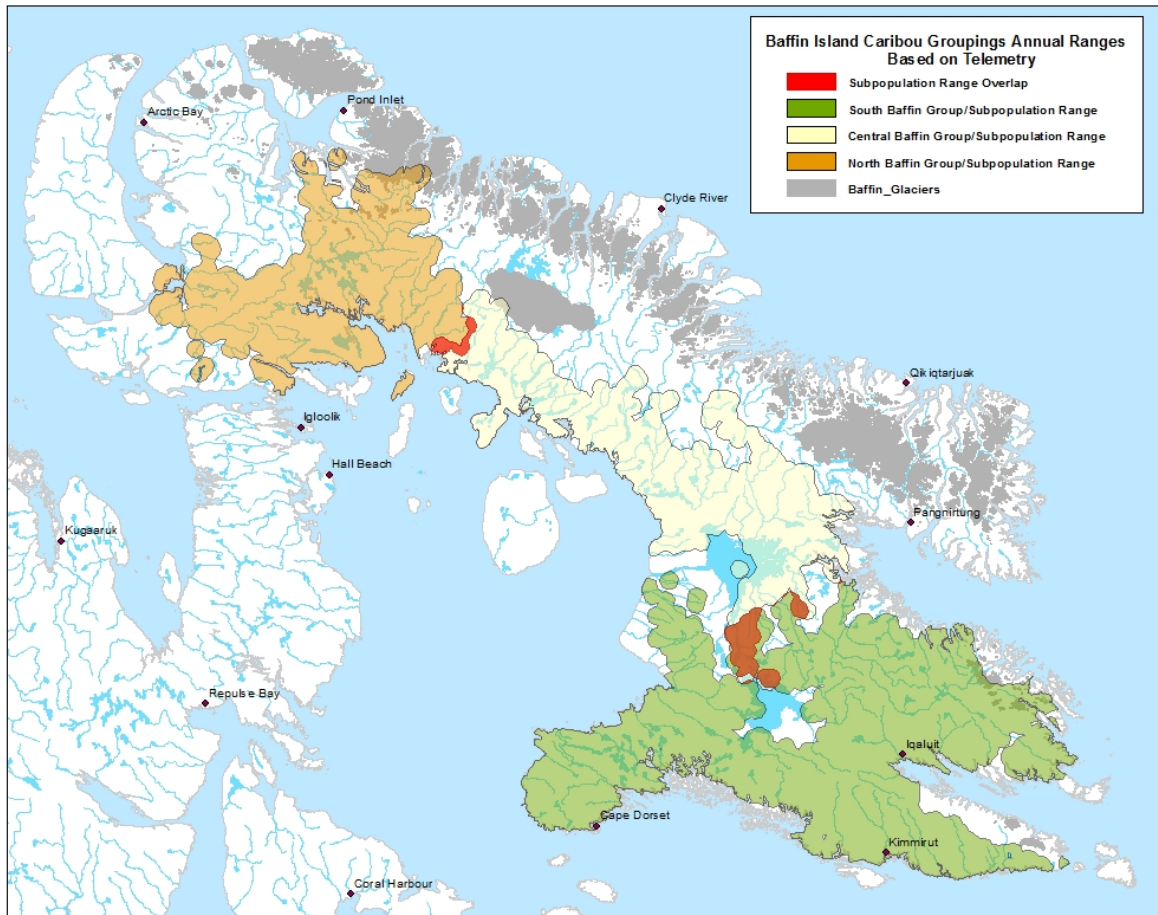


Figure 1. Caribou grouping annual range delineation based on telemetry studies from 1987 to 1994 (primarily South Baffin), and 2008 to 2011 (North Baffin). Polygons created utilizing a kernel analysis (See methods) of telemetry point data collected for 107 collars (North=35; Central = 17; South = 55). Excerpt from Campbell et al. 2015. Used to delineate survey area during composition studies.

Local hunters, trappers, and community members began to detect declines in the caribou population on the island in the mid to late 1990s (Jenkins et al 2012; Ferguson, 1993; Ferguson and Gauthier, 1992; Ferguson et al. 1998). In February/March 2014, the Government of Nunavut, Department of Environment (DOE) conducted aerial surveys across Baffin Island, Melville Peninsula, and surrounding islands to estimate the abundance and general distribution of caribou. Aerial surveys were conducted in February and March of 2014 using a combined double observer pair and distance sampling method (Campbell et al, 2015). This survey estimated the number of caribou within different geographic locations, including: 1) North Baffin Island 2) South Baffin Island 3) Baffin Island in its entirety 4) Baffin Island and its ancillary islands, and 5) Baffin Island and northern Melville Peninsula. A total of 1,157 Caribou were observed during the survey, 50 caribou in 8 groups in North Baffin, 347 in 104 groups in South Baffin, 557 caribou in 164 groups on Prince Charles Island, and 31 caribou in 7 groups on Melville Peninsula (Campbell et al. 2015). From these results, it was estimated that 315 (95% CI=159-622; SE=109; CV=0.35) caribou were in North Baffin, 2,734 (95% CI=1,777-4,207; SE=607; CV=0.22) caribou in South Baffin (including Foxe Peninsula and Central Baffin), 1,603 (95% CI=1,158-2,220; SE=250; CV=0.16) caribou on Prince Charles Island, and 220 (95% CI=88-551; SE=101; CV=0.46) caribou within northern Melville Peninsula, yielding a

Baffin wide estimate of 4,872 (95% CI=3,462-6,484; SE=712.23; CV=0.15) caribou. Campbell et al. (2015) also re-analyzed results from surveys flown in North Baffin in April 2009, and South Baffin in 2012, and found no statistically significant change in abundance between these and the 2014 surveys.

As a result of the low abundance of caribou on Baffin Island estimated in 2014, an eight-month moratorium was put in place on January 1, 2015. Following this moratorium, a Total Allowable Harvest (TAH) and a non-quota limitation (NQL) of a male-only harvest (250 TAH) was implemented by the Nunavut Wildlife Management Board (NWMB) in 2015. The annual caribou harvest season on Baffin Island is open from July 1- June 30. If the annual TAH (Table 1) is achieved prior to June 30 the season is ultimately closed and no additional harvest allowed. During the 2015/16, 2016/17, 2017/18 and 2018/19 harvest seasons the harvest was restricted to male-only. However, females were harvested illegally in each season. Starting in the 2019/20 season, the non-quota harvest restrictions were modified to allow harvest of up to 25 female caribou (cows) without calves. Communities are further allocated a set TAH for each harvest season by the Qikiqtaaluk Wildlife Board (QWB).

Table 1. Seasonal harvest allocations and caribou harvested by season and region.

Year	TAH	Harvest Allocation			Caribou Harvested			Total Caribou Harvested	Females Harvested*
		North Baffin ¹	Central Baffin ²	South Baffin ³	North Baffin ¹	Central Baffin ²	South Baffin ³		
2015/16	170	50	60	60	42	71	74	187	19**
2016/17	250	67	92	91	56	87	90	233	10
2017/18	250	66	90	94	52	88	92	233	14
2018/19	250	66	90	94	54	89	93	236	7
2019/20	250	63	89	98	58	75	118	251	18
2020/21	250	63	76	98	68	80	99	247***	21
2021/22	250	67	84	99	N/A	N/A	N/A	N/A	N/A

* Females harvested are included in the "Total Caribou Harvested"

** 5 of the females harvested are suspected and not confirmed

*** not including 9 additional suspected harvests.

¹North Baffin allocation divided between communities of Pond Inlet, Igloodik, Arctic Bay and Sanirajak (Hall Beach). Sanirajak had an allocation of zero for 2019-2021.

²Central Baffin allocation divided between communities of Clyde River, Pangnirtung and Qikiqtarjuaq.

³South Baffin allocation divided between communities of Iqaluit, Kimmirut and Kinngait (Cape Dorset).

Since the 2014 survey the DOE has conducted fall and/or spring aerial composition surveys from 2015-2021, excluding spring of 2020, as a means to monitor productivity and relative densities of caribou across Baffin Island. The objectives of these monitoring indices were to:

- 1) Estimate the overall composition of the subpopulations, including the north Baffin grouping, south Baffin grouping, and central Baffin grouping (Figure 1); i.e. what proportion of the population are young bulls, old bulls, cows, yearlings, and calves.
- 2) Estimate the trajectory of abundance of the three main groupings of the Baffin Island caribou population based on demographic composition. Using spring composition results, determine through a comparison between fall composition results, and where possible, similar tundra-wintering barren-ground subpopulations, if an index of calf productivity (measured as calves per 100 cows) suggests an increasing or decreasing population trend.

- 3) Monitor the proportion of bulls in the population to ensure that the bull only harvest is not reducing bulls to a proportion that could interfere with breeding (rutting) success.
- 4) Build a database with which to estimate the current population trend through demographic modeling, utilizing all demographic composition data to project a trend from the 2014 population estimate.
- 5) Provide information for discussions regarding management actions (including TAH) and monitoring plans and intensity.

Methods

Surveys were conducted in the spring of 2021 (March 18-April 9) on Baffin Island, Nunavut. Weather and logistical constraints limited the extent of surveying to key areas where a greater chance of caribou encounters were suspected based on past telemetry studies, surveys, and IQ for the spring season (Figures 2 & 3). Surveys were conducted using a Eurocopter AS350 B2 rotary wing aircraft, and a survey crew consisting of a biologist, wildlife technician, an observer, and a pilot. Study areas were selected based on previous aerial surveys and telemetry programs, and information gathered from hunters from each of the Baffin communities during consultations conducted in 2012, 2013, 2014, and 2015 (DOE 2013, 2014, 2015a, 2015b; Jenkins and Goorts 2013). Study areas were surveyed using two to three transects evenly spaced, bisecting appropriate habitat, or until tracks were observed. The method relied on tracking groups and/or individual caribou until they were sighted; however, visual sighting methods were used when tracking was either difficult or not possible. Once tracks were observed, they were followed until the group was located. Once a group was located and individuals identified, transects through the study area would be tightened up to 1 to 2 km apart to take advantage of clustering behaviour observed during previous survey and tracking studies where many caribou groups were observed in small geographic clusters during late winter and spring. Once sighted, caribou would be classified into 5 categories; 1) Cow (based on the presence of a visible vulva patch), 2) Calf (based on body characteristics), 3) Yearling (based on body characteristics), 4) Mature Bull (based on absence of vulva patch, body characteristics and antler size) and 5) Young Bull (based on absence of vulva patch, body characteristics and antler size). When possible, image stabilizing binoculars were used to reduce approach distances as much as possible to limit disturbance to animals. In cases where groups could not be located due to fuel and/or weather-related issues, and where time allowed, tracking was resumed the following day or after refuelling, where possible.

Observations were record by hand and waypoints taken for each group using a Garmin 78S. Daily flight track logs were recorded using a Garmin 78s and a Garmin Montana 610 (as a backup). Priority was given to cow and calf observations; however, bulls were recorded when possible. Although preference was given to caribou observations, predators were documented when observed.

Results

We flew a total of 38.4 hours in South Baffin from March 18-23, 2021 and 31.6 hours from March 30 to April 9, 2021 in North Baffin (Table 2). The South Baffin crew consisted of John Ringrose (GN), Amelie Roberto-Charron (GN), Christopher Mutch (GN), and Jason Aliqatuqtuq (Nunavut Tunngavik Incorporated). The North Baffin crew consisted of Nathan Ootoova (Mittimatalik HTO), Gordon Carl

(Panorama Helicopters) John Ringrose (GN) or Chris Mutch (GN). The aircraft used was an A-Star B2 helicopter piloted by Daniel Belanger of Panorama helicopters in South Baffin and Glen Sibbeston in North Baffin. Flights were focused in similar locations to previous spring and fall surveys (Figures 2 & 3).

Survey dates, flight hours and conditions

Table 2. Survey dates and general flight locations in south and North Baffin during spring composition surveys in 2021.

Date	Location (general)	Flight Hours
South Baffin		
March 18, 2021	Iqaluit local	6.3
March 19, 2021	Bond Inlet	8.4
March 20, 2021	No flight due to weather	
March 21, 2021	Loks Land	7.8
March 22, 2021	Hall Peninsula	8.2
March 23, 2021	McKeand River Valley	
March 24, 2021	No flight due to weather	
March 25, 2021	Markham Bay	7.7
<i>Total</i>		<i>38.4</i>
North Baffin		
March 30, 2021	Short flight due to weather	
March 31, 2021	No flight due to weather	
April 1, 2021	Mary river	6.6
April 2, 2021	No flight due to weather	
April 3, 2021	Mary River/Steensby Inlet	6.0
April 4, 2021	No flight due to weather	
April 5, 2021	Coats Inlet (weather delay)	3.0
April 6, 2021	Southeast of Pond Inlet	8.0
April 7, 2021	South of Pond Inlet (weather delay)	2.7
April 8, 2021	No flight due to weather	
April 9, 2021	Steensby Inlet	5.1
<i>Total</i>		<i>31.6</i>

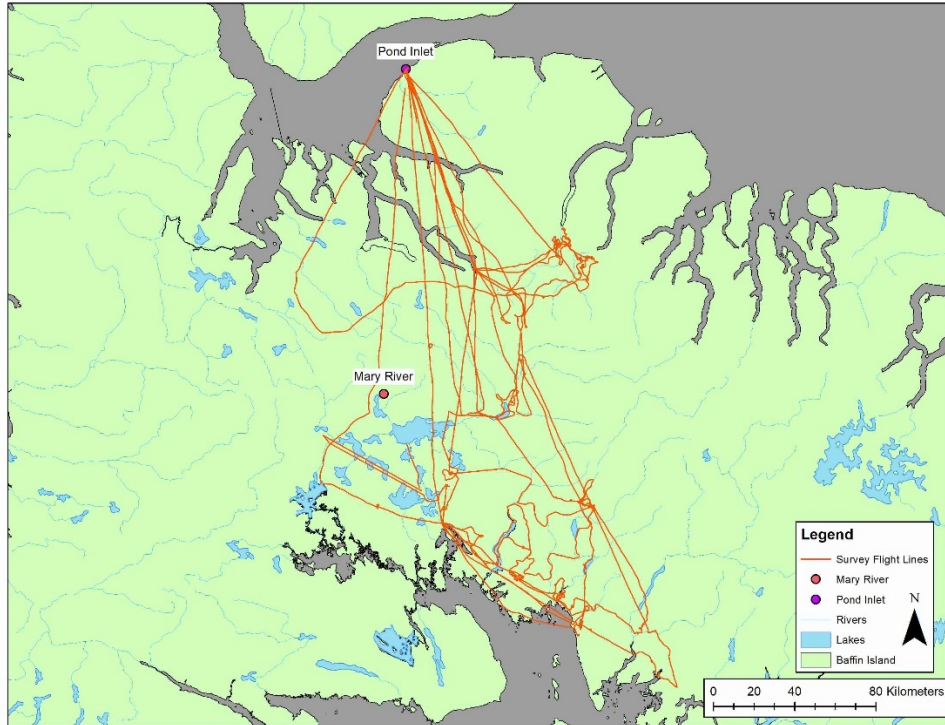


Figure 2. Composition survey flight lines in North Baffin in spring 2021.

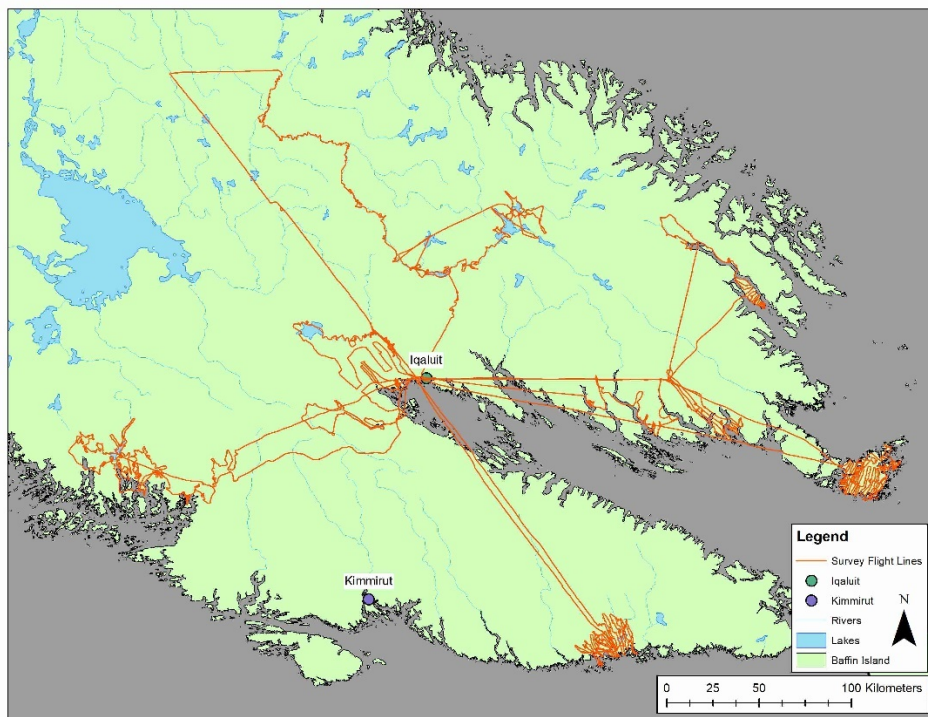


Figure 3. Composition survey flight lines in South Baffin in spring 2021.

Across the South Baffin survey area, we observed a total of 1,734 caribou and in the North Baffin survey area we observed a total of 192 caribou (bulls, cows, yearlings and calves) (Table 3). The southern survey areas were further divided into Lockland, Hall Peninsula and Meta Incognita Peninsula. The purpose of this further division was to identify regional variation in the demographics and total number of caribou observed in each area. Search effort was focused on locating cow and calf caribou and not maximizing the number of total individuals therefore the number of caribou observed is not representative of the overall population size. No wolves or wolf tracks were observed.

Calf to Cow Ratio

In South Baffin, calf to cow ratios varied from 41 calves:100 cow in Hall Peninsula to 55 calves:100 cow in Loks Land. When all regions of south Baffin were combined the ratio was 47 calves:100 cow. In north Baffin there were 63 calves:100 cows (Table 3).

Bull to cow Ratio

No bull to cow ratio was calculated for this survey due to preference given to locating calves and cows. Surveys completed in the fall are most effective in determining bull to cow ratios because of aggregation and mixing of the sexes at this time.

Table 3 Number of observed caribou by sex/age group during Baffin Island composition surveys in South and North Baffin 2021

Year	2021								
Season	Spring								
Location	North	Central	Prince Charles Island	Central Baffin + Prince Charles Island	South (Meta + Hall +Loks Land)	Meta Incognita Peninsula	Hall Peninsula	Loks Land	Hall + Loks Land
Calves Observed	55				379	220	58	100	159
Cows Observed	87				805	480	140	183	324
Calves/100 Cows	63				47	46	41	55	49
Yearlings Observed	6				158	92	44	22	65
Bulls Observed	44	not completed	not completed	not completed	392	248	108	36	130
Bulls/100 Cows	N/A				N/A	N/A	N/A	N/A	N/A
Bull + Cows	131				1197	728	248	219	454
Adults + Yearlings Observed	137				1355	820	292	241	519
Total Observed (Calves, Yearlings and Adults)	192				1734	1040	350	341	678

Discussion

Calf to Cow Ratio

Calf ratios can be used to indicate the likely population trend and help ensure effective management actions are used during population increases or declines. Calf recruitment is an important factor in the rate and success of population growth (Boulanger and Adamczewski 2015). It is important to compare the observed calf ratios to baseline values to determine the population trajectory. There has been little research conducted on tundra wintering caribou and as a result there is no baseline value that exists for either calf:cow ratio or bull:cow ratio for this ecotype. However, we believe until a baseline is developed for Baffin Island caribou, it is reasonable to use the baselines for taiga wintering barren-ground caribou. It has been suggested that calf:cow ratios in barren-ground caribou in the Northwest Territories can be as high 70-90 at calving, 50-70 in the fall and 30-50 following winter when populations are stable or increasing (Adamczewski et al. 2009; Tobey 2001; Gunn et al 2005).

Ratios in South Baffin, whether combined or further separated by area, were within 30-50 calves:100 cow, which suggests a stable or increasing population. Although these ratios are commonly used to indicate population trend, there is an inherent amount of risk associated with using baseline values from different populations.

Calf:cow ratios can be extremely valuable to wildlife managers when combined with multiple additional sources of information such as survival rates, Cow:Calf ratios from different seasons, distribution, harvest rates and overall population change. For example, with this information the impacts of harvest and what amount of harvest a population can withstand without declining can be determined. Unfortunately, much of this information is currently unavailable for Baffin Island.

Limitations of the data

All types of wildlife surveys have limitations in their power to predict changes to abundance or long-term trends. Composition surveys are limited in their ability to predict short-term trends when multiple factors, such as increases in disease or overharvesting, are influencing the population structure. These same surveys, over the longer term can provide a useful index of population trend, offering a useful tool with which to determine the most effective timing of abundance estimates. Composition surveys on Baffin Island were separated by survey region (possible subpopulations), and without definitive delineations of subpopulations, it is higher risk to manage populations or base management decisions on trends at this scale. These types of long-term trends are more useful as an index to advise abundance survey frequency and timing. Identified trends must be taken with caution as sampling is completed within a relatively small geographic area. There are many factors that contribute to population growth and decline in addition to calf survival and demographics. Therefore, in order to accurately predict population growth or decline, it is important to use results from these surveys in conjunction with other sources of data, such as local knowledge, IQ and regular reconnaissance and abundance surveys.

The impact of predation is expected to be low at this time due to the limited observations or reports of wolves from hunters.

One observation of particular interest is that in recent years, locating caribou the spring has been generally easier on Meta Incognita Peninsula than on Hall Peninsula. It is unclear if this reflects a distributional shift between these areas or an increase in abundance in one region and a decrease in the

other. The impacts of shifts in distribution or changes in regional abundance can be identified using a combination of telemetry programs and abundance surveys.

Consultation progress

Due to travel restrictions associated with the COVID-19 pandemic in 2020 and early 2021 there were minimal in-person consultations conducted prior to this survey. Once finalized, this report will be provided to communities and in-person consultations are expected in the Fall of 2021.

Management implications and next steps

Long-term management of Baffin caribou relies on the active participation of all co-management partners. Current information gaps exist for Baffin caribou and are needed to ensure a quick and successful recovery. Although the GN has initiated a GPS collaring program on Baffin Island, there is a current lack of data available to identify changes in distribution. As previously mentioned, the adequacy of the observed calf:cow ratios to indicate population trend is unknown. However, the composition surveys and the information collected as a result is invaluable and adds to our knowledge of Baffin caribou. To assess the adequacy of Calf:cow ratios, results from composition surveys must be combined with the results of the next abundance survey. A second quantitative abundance estimate can be used to identify the change in abundance since the first estimate in 2014. Maintaining a consistent harvest and reporting regime between estimates and documenting calf:cow ratios will help identify the impact of harvest over this period.

Although composition survey results may indicate a stable or increasing population trend, it is important to use these results in combination with IQ, distribution data, and complete another abundance survey to validate the composition survey trends and ensure a successful population recovery is occurring. After a new abundance survey is completed an assessment can be made of the accuracy of the NWT baseline values as an indicator of calf productivity for Baffin Island. Once assessed the composition surveys may be a stronger tool that can be used for future management.

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