

**Consultations with Hunting and Trapping Organizations on the Baffin Island  
Caribou Composition Survey Results, Future Research Recommendations, and  
Draft Management Plan**

January 7-18, 2019



Department of Environment, Government of Nunavut, Iqaluit, Nunavut

## Executive Summary

Government of Nunavut (GN), Department of Environment (DOE) representatives conducted consultations with Hunters and Trappers Organizations (HTOs) in the Baffin region from January 7-18, 2019.

The intent of this round of consultations was to ensure HTOs were informed on the results of caribou abundance and composition surveys from 2014 to present on Baffin Island. DOE presented options for future research on Baffin Island including a telemetry-based collaring program. The feedback collected during this round of consultations will aid the GN in future research planning and monitoring for Baffin Island caribou.

This report attempts to summarize the comments made by participants during the round of 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, Cape Dorset, Hall Beach, Igloolik, Arctic Bay and Pond Inlet. Unfortunately during this consultation tour weather prevented us from meeting with Clyde River but the DOE is currently planning to meet with the HTO in February 2019.

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

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## 1.0 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 summarized 2015-2018 composition survey results, caribou monitoring methods, and the draft Baffin Island Caribou Management Plan. The following communities were consulted from January 7-18, 2019:

- Kimmirut, January 7, 2019
- Clyde River, Postponed due to weather
- Qikiqtarjuaq, January 8, 2019
- Pangnirtung, January 10, 2019
- Iqaluit, January 11, 2019
- Cape Dorset, January 14, 2018
- Hall Beach, January 15, 2019
- Igloolik, January 16, 2019
- Arctic Bay, January 17, 2019
- Pond Inlet, January 18, 2019

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.

## 2.0 Purpose of Consultations

The preliminary consultations were to discuss the newest information regarding the Baffin Island Caribou and allow HTOs to voice questions, comments and concerns regarding future research programs.

### 2.1 Format of Meetings

The meetings were held in the evening and ran between 3 to 4.5 hours depending on HTO engagement. Meetings were facilitated and led by the Baffin Regional Wildlife Biologist, John Ringrose, and the Kivalliq Regional Wildlife Biologist, Mitch Campbell. Each consultation started with a presentation by John Ringrose on the two survey methods used by the GN since 2014 for monitoring caribou; aerial abundance surveys and composition surveys (Appendix 1). The participants were invited to ask questions, raise concerns, or provide advice during the presentation but were advised there would be breaks for questions. The presentation then provided the HTOs with survey results from 2015-2018 composition surveys across Baffin Island. Mr. Campbell then presented on the caribou monitoring program in the Kivalliq region including, aerial surveys (abundance), composition surveys and telemetry. After this presentation there was a break for questions. Mr. Ringrose then provided a brief description of the draft Baffin Island caribou management plan and asked for comments, concerns and questions from HTOs regarding the plan. After the presentations, questions/discussion continued until no further questions were raised. DOE asked HTOs to internally discuss the

addition of a telemetry collaring program on Baffin Island and provide letters of support for collaring work in their region.

### **3.0 Summary by Community**

The objectives of the consultations were made clear to the HTO members prior to and at the start of each meeting. There were many similar questions, concerns and suggestions raised by HTO Board members in all the communities consulted.

#### **3.1 Kimmirut**

**Date:** January 7, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, Acting South Baffin Manager: Alden Williams
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Mayukalik HTA Board members
  - Sandy Akavak
  - Mikidjuk Kolola
  - Jeannie Padluq
  - Kapik Ikkidluak
  - Palanga Lyta
  - Pitsiulala Akavak
  - Kamikee Akavak
  - Dustin Joanas

**Comments and questions:**

The HTO members expressed their interest in the logistics of composition surveys and the recent suspected die-offs on Prince Charles Island. The HTO members wondered if collaring would be done in the future and if the consultations were regarding changes to the Total Allowable Harvest (TAH). They also raised concerns regarding development activities and how elder information and Inuit Qaujimajatuqangit (IQ) would be incorporated into future research.

HTO members indicated that ongoing monitoring needed to more accurately detect changes in the population and lead to more responsive management actions such as TAH changes. Mikidjuk Kolola asked that if an increase was observed in south Baffin but not in north Baffin would an adjustment to the TAH be considered in south Baffin only. The DOE explained how the use of telemetry may be able to separate different subpopulations and allow abundance surveys to occur on smaller scales and be more reactive to changes. The HTO asked about the detailed logistics of collar deployment and what the effects would be on caribou. HTO members

were curious if there was ongoing monitoring of wolf abundance. There was concern with the Bull-only harvest and the effect it may be having on the population.

There was some confusion about the ongoing federal listing process and the recent round of consultations by the federal government. DOE, QWB and NWMB provided clarification of the differences between the federal consultations and the current meeting.

No comments were provided regarding the draft management plan during the meeting. The HTO said they will discuss this internally at an upcoming board meeting and provide input to the GN in writing.

### **3.2 Qikiqtarjuaq**

**Date:** January 9, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, Acting South Baffin Manager: Alden Williams
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- Nativak HTO Board members
  - Alison Kopalie
  - Juelie Kuksiak
  - Loasie Alikatuktuk
  - Jacopie Audlakiak
  - Jonah Keeyookta
  - Jaypatee Newkinguak
  - Uriah Newkinguak

**Comments and questions:**

The HTO members discussed the population decline that they observed in the early 2000s. There was concern over the number of wolves spotted during the surveys and low number of caribou in their area. DOE clarified that they had observed very few wolves during surveys from 2012 to present and they believe the impact of wolves at this time is relatively low. The HTO provided information regarding caribou locations in the mountainous areas surrounding Qikiqtarjuaq as well as historical hunting areas.

The HTO commented on the historical movement patterns of caribou on Baffin. The QWB provided input of historical information from discussions with elders. QWB identified that Inuit believe there are different types (subpopulations) of caribou on the island that display different behavioural patterns and utilize different habitats. Additional survey methods, such as including cameras or video cameras with composition surveys, was discussed but determined that using

them at this time would likely increase survey time and negative effects on the caribou. There was interest expressed in the Nunavut Harvesters Support Program (NHSP) offered by NTI and a commitment was made by NTI to provide further information after the meetings.

No comments were provided regarding the draft management plan during the meeting. The HTO said they will discuss this internally at an upcoming board meeting and provide input to the GN in writing.

### **3.3 Pangnirtung**

**Date:** January 10, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, Acting South Baffin Manager: Alden Williams
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- Pangnirtung HTA Board members
  - Davidee Nowyuq
  - Johnny Mike
  - Mark Kilabuk
  - George Qaqqasiq
  - Billy Etooangat
  - Kelly Qaapik
  - Patrick Kilabuk

**Comments and questions:**

The HTO members expressed their interest in the population estimates from 2014, the estimated trend in productivity based on composition and the desire to take part in GN led surveys. The HTO was interested in the overall productivity of the herd and the number of bulls that are likely required to ensure cows are bred. The QWB provided insight to the movement of caribou between Baffin Island and the mainland on Melville Peninsula. The QWB stated that they do not believe that movement between the peninsula and Baffin Island makes a large impact on the numbers of caribou on Baffin Island.

The HTO members expressed they believe there is a small group of caribou present to the east of Pangnirtung and expressed that if another abundance survey was to be conducted, this area should be discussed. DOE clarified how the 2014 abundance survey results supported decisions regarding TAH and which areas are included in the TAH for Baffin Island. GN, QWB and the HTO



discussed estimated wolf numbers on the island and the numbers observed during surveys since 2014 but all parties agreed that the current impact from wolves on caribou was likely low.

The HTO showed interest in the telemetry collaring process including field logistics and collar application. DOE indicated that if collars were to be supported by the HTO and applied to caribou on Baffin Island it would likely be mature cows that received collars. The QWB provided insight as to collaring methods that were done in the 1990s and field measurements that will ensure only mature adults are being collared. The HTO expressed a need for better management of caribou on Baffin as well as the need for additional movement and distribution information to support the current IQ. Billy Etooangat stated that he saw the value in collaring caribou so they could know where they are going and allow DOE to conduct surveys of the areas where caribou are found. The HTO mentioned the DeBeers diamond mine on Hall Peninsula and they are concerned about the effects of this project on caribou in their hunting area. They believe that a telemetry program may be beneficial to assess the impacts.

The community of Pangnirtung has a hard time hunting caribou right now because caribou don't seem to be migrating where they used to and access to these areas is difficult due to thin ice.

No comments were provided regarding the draft management plan during the meeting. The HTO said they will discuss this internally at an upcoming board meeting and provide input to the GN. Many members said this was their first time seeing this management plan so they wanted an opportunity to review it internally.

### **3.4 Iqaluit**

**Date:** January 11, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, Acting South Baffin Manager: Alden Williams
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Amaruq HTO Board members
  - Jerry Ell
  - David Alexander
  - Martha Kunuk
  - Ben Kovic
  - Manasie Mark

**Comments and questions:**

The meeting in Iqaluit discussed the merging of survey results and IQ, the number of bulls needed in a population, and the need for additional tools, such as a telemetry program, to support IQ.

The HTO expressed their concern regarding the bull-only harvest and the issues that would arise if the number of bulls were reduced. DOE representatives agreed that harvesting too many bulls will limit productivity of the population but monitoring to date has suggested there are currently enough bulls in the population in south Baffin. The QWB expressed that during previous conversations with elders it was identified that the quality of bulls is important.

The HTO asked whether there is any current technology available that can be used to better understand caribou movements across the island and if the GN has considered collaring any caribou.

After the GN presented about the telemetry program in the Kivalliq region there was support from the HTO for a similar program on Baffin. The HTO stated that they needed a telemetry collar program on South Baffin to address the concerns with TAH. Discussions followed regarding application of collar data, how many collars would be needed and if collaring would be done on bulls or cows. The HTO emphasized the need for new tools in the Baffin region including a telemetry collaring program. Jerry Ell expressed the desire of the HTO for a collaring program to the QWB representative, Mike Ferguson, and said that they wanted QWB to “make it happen”.

No comments were provided regarding the draft management plan during the meeting. The HTO said they will discuss this internally at an upcoming board meeting and provide input to the GN. There is a desire to have the TAH removed but there was no discussion at this meeting regarding increased abundance in south Baffin or objection to 2014 estimates. The HTO mentioned the need for additional resources to facilitate discussions with other HTOs.

### 3.5 Cape Dorset

**Date:** January 14, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, North Baffin Manager: Scott Johnson
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- Aiviq HTO Board members
  - Annie Suvega
  - Adamie Nuna
  - Dana Pootoogook
  - Simiga Suvega
  - Ejeeseak Peter
  - Tagialuk Nuna

- Ningeoseak Etidloi

### **Comments and questions:**

The majority of discussion with the Aiviq HTO included concerns over the bull-only harvest, how the composition surveys allow monitoring the herd productivity, Baffinland Iron Mines in North Baffin, concerns about development, and movement patterns of caribou on the Island.

QWB questioned the validity of calf:cow and bull:cow ratios and referred to a paper from the 1990s where there were 42 calves:100 cows but this is based on a limited sample size. Mike Ferguson stated that he believes the ratios being used need further refinement.

The HTO asked if there were more bulls or cows based on previous survey results and was under the impression that the bull-only TAH was because there were more males in the population. The GN clarified that composition surveys are designed to be incorporated with IQ to detect changes in productivity. The HTO was unsure if harvesting on Prince Charles Island was allowed and the GN clarified that harvesting can occur but it is likely there has been a reduction in the number of caribou in this area because of several die-offs in 2016 and 2018. The HTO asked whether there will be female harvest in the future and the QWB responded stating that a private discussion between QWB and the HTO would commence after the meeting to discuss TAH issues. However, the GN explained that in order to maintain productivity of the population, the number of tags would need to be reduced if female harvest is accommodated.

The HTO asks about caribou in north Baffin, relative to Mary River, and identified the need for additional information in the future to help reduce the problems associated with development. DOE identified the likely effects of roads and developments on caribou and what impact this may have on caribou in North Baffin.

A desire to have caribou or reindeer introduced to the 3 small islands south of Cape Dorset was mentioned by the HTO. Movement patterns of caribou were also mentioned by the HTO and addressed suspected movement to Northern Quebec and within Baffin between areas south of Nettling Lake and the southern peninsulas.

Similar to previous meetings there were no comments provided regarding the draft management plan during the meeting. The HTO said they will discuss this internally at an upcoming board meeting and provide input to the GN.

### **3.6 Hall Beach**

**Date:** January 15, 2019

#### **Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, North Baffin Manager: Scott Johnson
- NTI, Resource Management Advisor: Cheryl Wray

- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- Hall Beach HTA Board members
  - Jaypeetee Audlakiak
  - Jopie Kaernerik
  - Cain Pikuyak
  - Zillah Pialiaq
  - Inokie Iqittuq (elder)
  - Abraham Ullalaa
  - Sam Arnardjuak
  - George Innuksuk
  - Joyce Arnarojuak

### **Comments and questions:**

Discussions with the Hall Beach HTO included bull-only harvest, the TAH system and allocations between communities, composition survey methods, and telemetry collar information.

The HTO expressed their interest in taking part in surveys in the future and the incorporation of IQ into design, management and future plans. DOE representatives clarified that the composition survey results are incorporated with IQ and hunter observations: they are not mutually exclusive. The QWB states that they are responsible for the allocation of tags between the 10 HTOs and that if Hall Beach wants tags this year they will have to ask another HTO or discuss with QWB for the future.

Discussions surrounded identification of males and females from the helicopter and use of composition data to determine the productivity and the number of bulls able to breed. The HTO identified that large die-offs may not have occurred on Prince Charles Island in 2018 because caribou could move off of the island. The DOE representatives provided insight into the number of dead caribou observed, the ice conditions between Air Force Island and Baffin Island, and that they do not have evidence to support a large scale movement but stated it was possible. The HTO asked about movements of caribou on Melville Peninsula and historical information was provided by QWB. Mike Ferguson stated that in 1982 they conducted a reconnaissance survey in June of the area west of Hall Beach and observed areas where calving occurred.

The HTO wanted additional information on how telemetry collars are applied in the field and which sex they are applied to. The DOE representatives provided insight into how the telemetry program is conducted in the Kivalliq region including field logistics and HTO participation. There was concern from HTOs regarding collars that were left on polar bears and caused mortality but DOE and QWB assured those concerned that technological advances have reduced the size and weight of collars and the drop-away system performs very well and only requires a single handling event of caribou. The HTO was concerned about a caribou that was collared from

2008-2011 that had a collar improperly applied that caused damage to the animal. The GN responded that this incident was because of improper installation and this example is being used to train current collaring teams. The QWB identified the desire to have a private meeting with the HTO after the consultation to discuss female harvest and future tag allocations.

The HTO expressed the desire to discuss the management plan internally at an upcoming board meeting. There were no comments provided regarding the draft management plan during the consultation.

### 3.7 Igloodik

**Date:** January 16, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, North Baffin Manager: Scott Johnson
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- QIA, Charlie Inuarak
- Igloodik HTO Board members
  - Simonie Issigaitok
  - Gideon Tugaoqak
  - Natalino Piuguttuk
  - Daniel Akittirq
  - Michelline Ammaaq
  - David Aqqiaruq
  - Edward Attagutaluk
  - Jacob Malliki

**Comments and questions:**

Discussions with the Igloodik HTO included the perceived die-offs on Prince Charles Island, HTO participation in surveys, telemetry collaring program for Baffin Island, and combining IQ with survey results.

The HTO expressed interest in the 2018 composition survey on Prince Charles Island where dead, skinny and weak caribou were observed. All parties agreed that in the future, if possible, samples should be taken when large scale die-offs are observed. The HTO were interested in taking part in surveys where possible and increasing the number of Inuit that take part in DOE surveys during field and planning phases.

As with other meetings there was discussion regarding the number of wolves observed during the surveys since 2014. DOE was able to provide some insight into this issue and stated that very few wolves have been observed since 2012 and it is unlikely that the wolf population at this time is having a significant impact on the caribou on Baffin.

After the presentation on the Kivalliq caribou monitoring program, there was discussion surrounding the logistics of collaring on Baffin. The HTO stated their interest in the information that collaring was able to provide but there was hesitation about the size of the collars shown during the presentation. The GN clarified that the collars shown in the presentation were older models and due to airline restrictions they couldn't bring one for the meeting. QWB, Mike Ferguson, stated that dummy collars may be an option to show the size and weight to HTOs and issues with roads were well known in Norway. The GN mentioned that the information from a collaring program would be a useful tool for HTOs to incorporate with IQ and utilize during land use discussions.

DOE then led discussions regarding accidental female harvest.

The HTO stated they wanted to discuss the management plan internally at an upcoming board meeting. There were no comments provided regarding the draft management plan during the meeting.

### **3.8 Arctic Bay**

**Date:** January 17, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, North Baffin Manager: Scott Johnson
- GN-DOE, Wildlife Officer; Matthew Akikulu
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Titus Arnakallak
- Ikajutit HTO Board members
  - Valerie Qaunaq
  - Joeli Qamanirq
  - Kunnak Enoogoo
  - Roland Taqtu
  - Paul Ejangiaq
  - Jonah Oyukuluk
  - Jennifer Pauloosie

**Comments and questions:**

The discussions with the Ikajutit HTO included survey logistics, male-only harvest, HTO participation in surveys, telemetry collaring program for Baffin, and combining IQ with survey results.

The HTO expressed interest in participating in upcoming survey work during the field and planning aspects. There was discussion regarding field logistics and how DOE deals with weather and mechanical issues and how these affect survey results. There was a lengthy conversation about female harvest with the HTO and the process for the GN, QWB and NWMB to adjust quotas and remove restrictions on female harvest.

The HTO expressed interest in a telemetry collaring program in response to effects of Baffinland Iron Mines on caribou in North Baffin. One member asked if a telemetry program could be initiated by DOE prior to the establishment of the railway south of Mary River to see what the effects were. There was also concern from the HTO about helicopters chasing caribou and flying very low. The DOE representatives advised the HTO that if aircraft are observed chasing caribou, the observer should be documenting the tail sign, the location and colour of the aircraft, the time of the incident, and report it to the GN. The HTO planned to discuss a collaring program at their next internal board meeting.

There were no comments provided regarding the draft management plan during the meeting. The HTO stated they wanted to discuss the management plan internally at an upcoming board meeting.

### 3.9 Pond Inlet

**Date:** January 18, 2019

**Representatives:**

- GN-DOE, Baffin Regional Wildlife Biologist: John Ringrose
- GN-DOE, Kivalliq Regional Wildlife Biologist: Mitch Campbell
- GN-DOE, North Baffin Manager: Scott Johnson
- NTI, Resource Management Advisor: Cheryl Wray
- NWMB, Wildlife Management Biologist: Kyle Ritchie
- QWB, Senior Wildlife Advisor: Michael Ferguson
- Translator, Abraham Kublu
- Mittimatalik HTO Board members
  - Amy Killiktee
  - David Qaminiq
  - Elijah Nashook
  - Eric Ootoova
  - Daniel Quasa
  - Phaniel Enogah
  - Enookie Inuarak

### **Comments and questions:**

The discussions with the Mittimatalik HTO included survey logistics, telemetry collaring in North Baffin, and effects from the Mary River project.

The HTO was concerned about the competence of the volunteer provided in 2018 and their inexperience in hunting or caribou identification. The parties discussed survey heights and different methods to ensure effective identification of males and females during composition surveys.

The HTO in Pond Inlet expressed concern over the effects of Baffinland and stated that since they are in the Mary River area they need the most help dealing with mining. There was also anger about the approved production increase and approval by the minister. The HTO expressed interest in splitting North and South Baffin as separate management areas.

After the presentation of the DOE Kivalliq caribou monitoring program there was discussion regarding collaring logistics and how collars are applied in the field. There was concern about collared animals losing weight due to the collars. The GN responded in saying that in general caribou wear the collars well and for the life of the collar. The GN explained 2 cases where caribou have been injured directly by collars and how these situations were included in future training to ensure it does not happen again. There was also concern that if a caribou died as a direct result of the collar, that caribou would come off the quota.

There were no comments provided regarding the draft management plan during the meeting. The board was unaware of earlier version of the management plan and even members that were not new did not remember discussions from 2015 with the HTO. The HTO stated they wanted to discuss the management plan internally. There seemed to be interest in the idea of a management plan by a few new members but no comments were made during the meeting.

## **4.0 Summary**

All nine HTOs sought clarification on abundance and composition survey methodology. All HTOs expressed interest in a greater involvement in GN led surveys including field aspects and pre-planning. The majority of HTOs expressed interest in some form of a telemetry collaring program in the future for Baffin Island. The Iqaluit, Pangnirtung and Arctic Bay HTOs had the most outspoken members in support of a collaring program but all HTOs indicated that they planned to discuss this internally prior to making a commitment. Many of the HTOs expressed their interest for modifying or adjusting the current TAH to include an aspect of female harvest. QWB had internal discussion with all of HTOs after the GN consultations to discuss the current TAH.

There were no comments from any HTO consulted regarding the draft management plan and all HTOs said they wanted to have internal discussions prior to submitting anything to the GN.



## 5.0 Appendix 1

# Baffin Island Caribou HTO Consultations

John Ringrose  
Baffin Regional Wildlife Biologist  
Pond Inlet  
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## Outline

Introduction

Survey Types

Composition Survey  
2015-2018 results  
2019 spring survey

Monitoring Caribou

Draft Management Plan  
Comments



# Introduction



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**John Ringrose**

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Regional Wildlife Biologist  
Baffin Region  
Department of Environment  
Government of Nunavut

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## Survey types and methods

### Two Main Types of Caribou Surveys

**Abundance**- The number of caribou

**Composition**- The ratio of bulls, cows, calves and calf survival

Fall surveys are best for Bull:cow ratio and a benchmark  
for over-winter calf survival trends

Spring Surveys are for calf over-winter survival

Baffin Island Caribou **Abundance** last completed in 2014

**Composition** Surveys completed 2015 -2018.

Next survey being completed March/April 2019

How do we determine how many caribou there are?

1) Pick where to fly on Baffin Island

ABUNDANCE\*\*

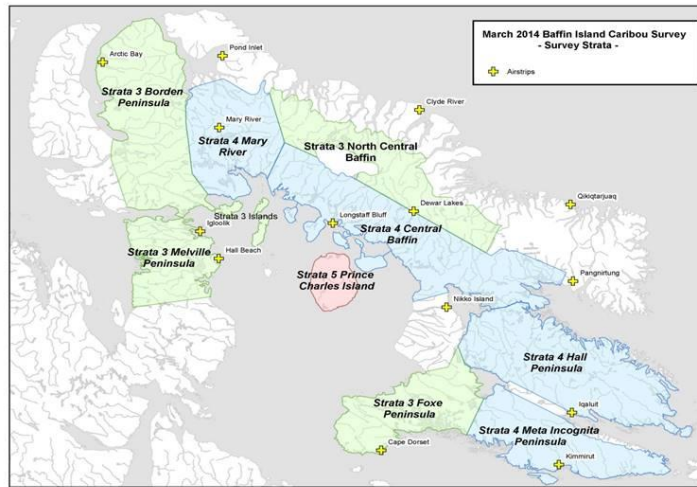


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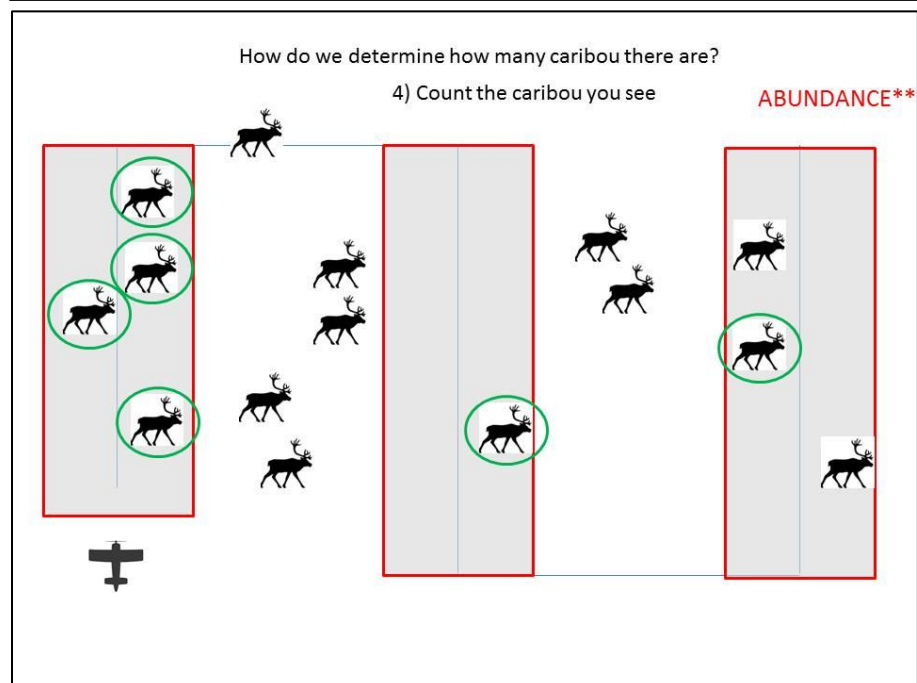
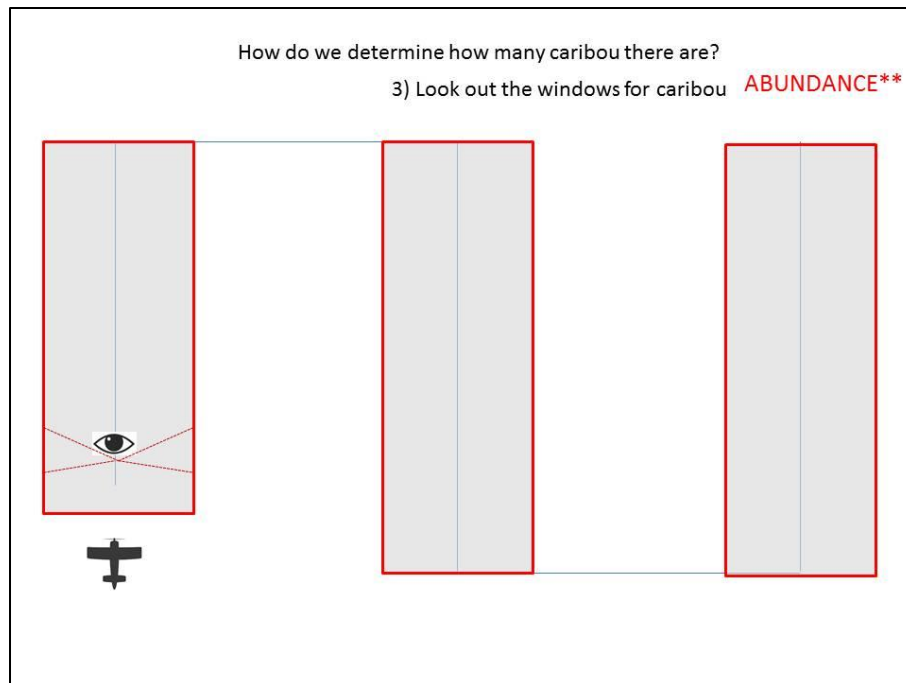


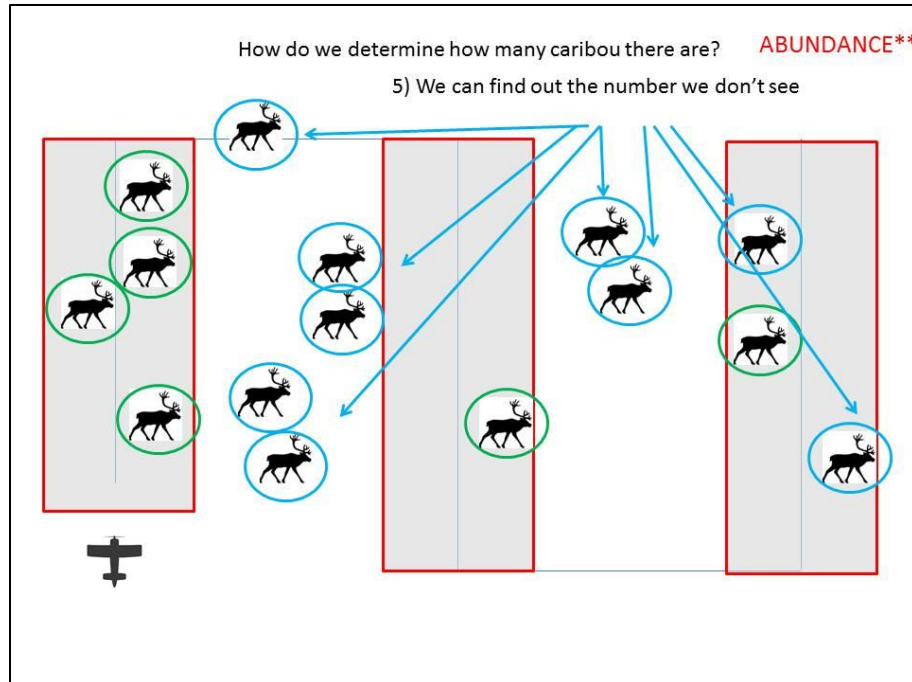
How do we determine how many caribou there are?

ABUNDANCE\*\*

2) Place lines on the island and fly along them

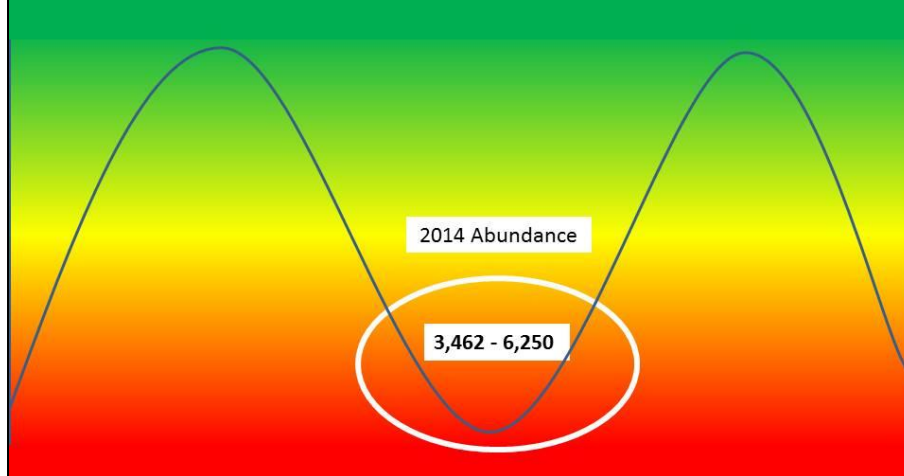






2014 Survey Number of caribou	Subpopulation	Individuals Observed	We are 95% certain the actual number of Caribou lay between these two values	<b>ABUNDANCE**</b>
	<b>North Baffin</b>			
	Borden Peninsula	1	1 - 30	
	Mary River	49	96 - 521	
	North Central Baffin	13	31 - 230	
	<b>Total</b>	<b>63</b>	<b>159 - 622</b>	
	<b>South Baffin</b>			
	Central Baffin	197	662 - 1,798	
	Foxe Peninsula	20	48 - 972	
	Hall Peninsula	176	467 - 1,686	
	Meta Incognita Peninsula	91	256 - 1,138	
	Prince Charles Island	557	1,158 - 2,220	
	<b>Total</b>	<b>824</b>	<b>3,169 - 5,935</b>	
	<b>Total (-Prince Charles Island)</b>	<b>267</b>	<b>1,777 - 4,207</b>	
	<b>Other areas</b>			
	Melville Peninsula	26	88 - 551	
	Baffin Island + Melville P.	1,130	3,661 - 6,484	
	<b>Baffin Island Total</b>	<b>1,104</b>	<b>3,462 - 6,250</b>	

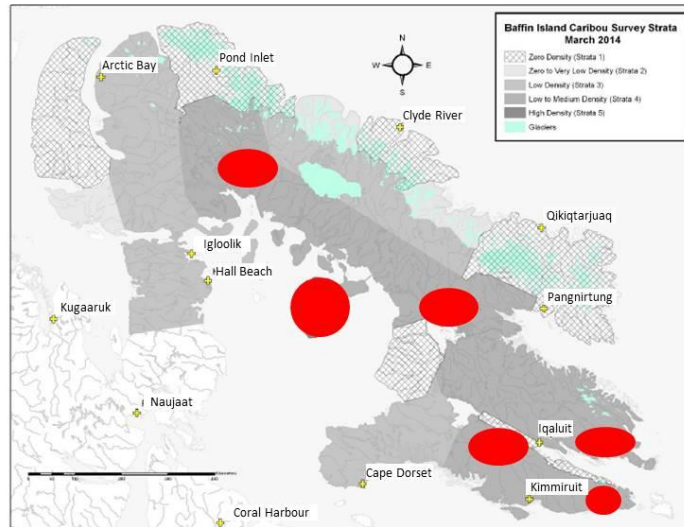
# Where are we now?



We know how many caribou there are. (ABUNDANCE)  
How many bulls (Immature, Mature), cows, calves, etc?

COMPOSITION\*\*

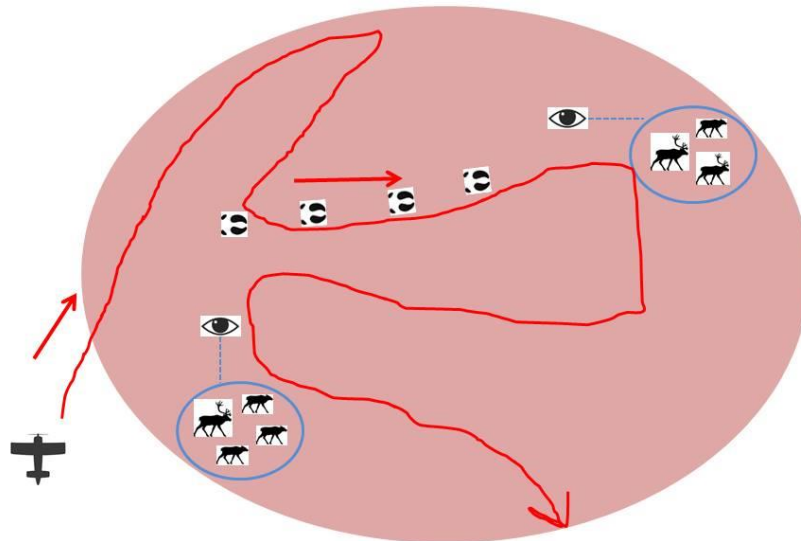
1) Locate main groups of caribou (HTO direction)



How many bulls (Immature, Mature), cows, calves, etc?

COMPOSITION\*\*

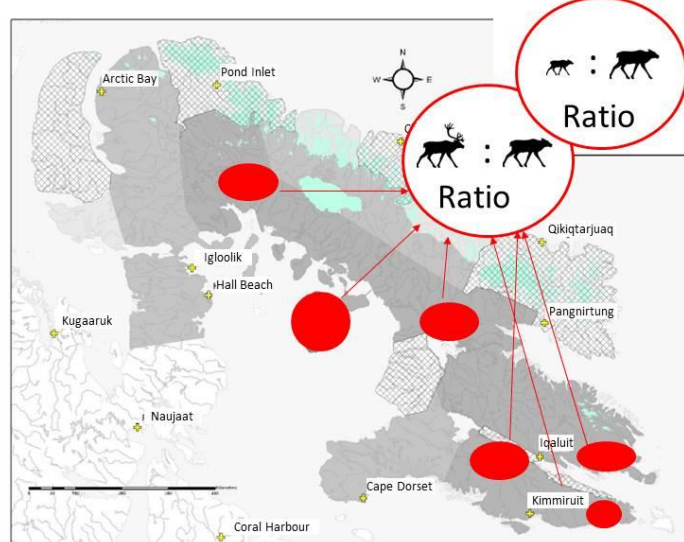
2) Fly to the area and search for tracks or caribou



How many bulls (Immature, Mature), cows, calves, etc?

COMPOSITION\*\*

3) Incorporate ratios from all areas represents the overall population





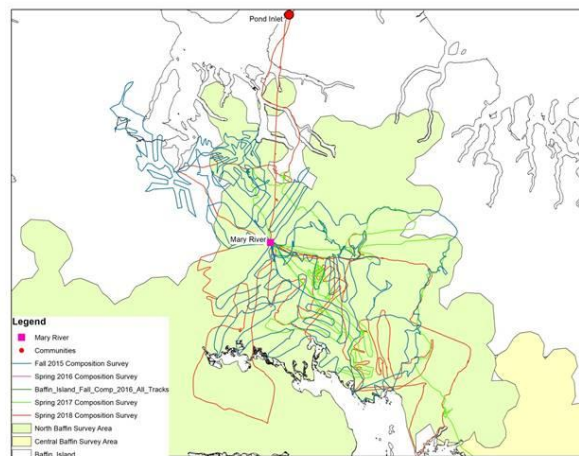
# Composition Surveys 2015-2018

## Objectives

- 1) Determine the vigor of the population based on productivity and demographic composition; i.e. what proportion of the population are young bulls, mature bulls, cows, yearlings, and calves.
- 2) Determine the trajectory of productivity of the population based on the demographic composition; and with spring composition results, determine if an index of calf productivity and overwinter survival suggests an increasing or decreasing trend.
- 3) Monitor bull ratios to insure that the bull only harvest is not reducing bulls to a proportion that could interfere with 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) Inform on management discussions regarding current TAH levels.

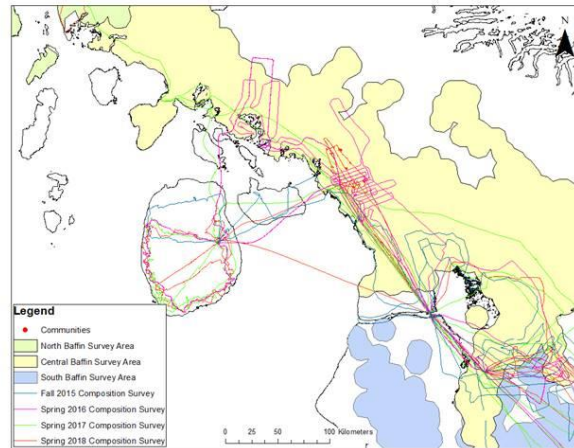
\*\*with multiple years of data and cow survival and calf over winter survival

# Composition Surveys North Baffin

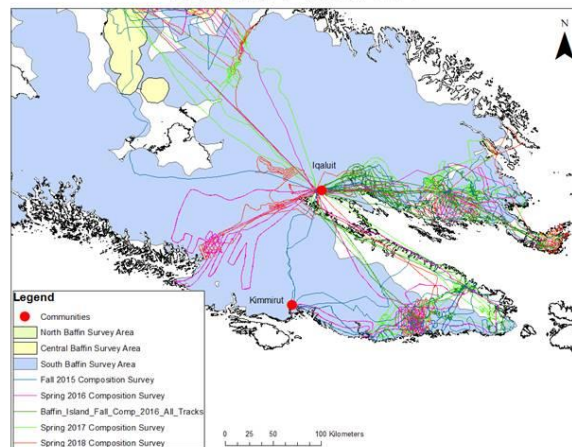




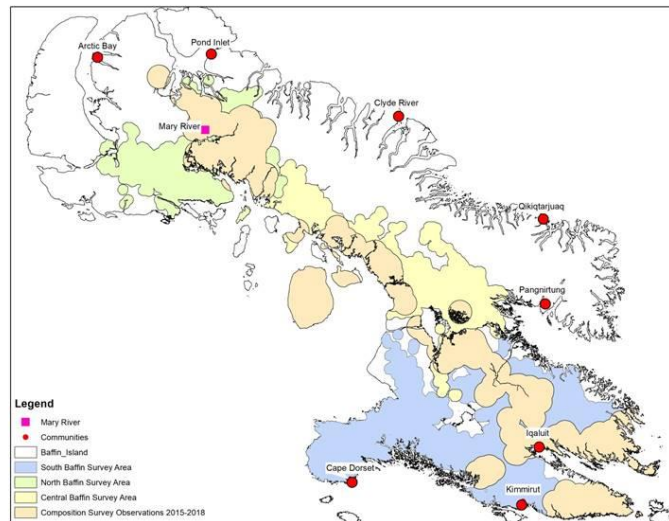
## Composition Surveys Central Baffin



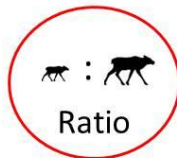
## Composition Surveys South Baffin



## Composition Surveys

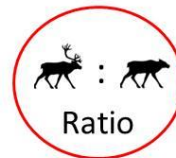


## Composition Surveys Results



Suggested calf:cow ratios in NWT for stable or increasing populations:

- 70-90 at calving
- 50-70 in the fall
- 30-50 following winter



40 bulls:100 cows is suggested as a benchmark for the number of bulls required in a population to ensure all cows are bred successfully (Tobey 2001).

These are just indices

## Composition Surveys Results- North

Fall

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	139	62	21	18	31	155	36	33	161	401
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	62	37	58	55	19	39	58	55	19	39
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	37	37	58	55	19	39	58	55	19	39
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	17	17	5	7	37	100	106	121	45	69
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	53	213	38	40	73	277	106	121	45	69
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	213	213	106	121	45	69	106	121	45	69
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	213	213	79	80	271	778	106	121	45	69
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	230	230	79	80	271	778	106	121	45	69
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	316	316	100	98	302	933	100	98	302	933



40 bulls:100 cows

40 bulls:100 cows

40 bulls:100 cows

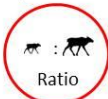
Suggests enough bulls to breed cows

## Composition Surveys Results- North

Spring

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	139	62	21	18	31	155	36	33	161	401
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	62	37	58	55	19	39	58	55	19	39
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	37	37	58	55	19	39	58	55	19	39
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	17	17	5	7	37	100	106	121	45	69
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	53	213	38	40	73	277	106	121	45	69
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	213	213	106	121	45	69	106	121	45	69
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	213	213	79	80	271	778	106	121	45	69
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	230	230	79	80	271	778	106	121	45	69
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	316	316	100	98	302	933	100	98	302	933



? Calves:100 cows

30-50 calves:100 cows

30-50 calves:100 cows

Suggests good calf over-winter survival

## Composition Surveys Results- Central

Fall

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	401	58	55
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	36	33	161	401	36	33	161	401	58	55
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	5	7	37	100	5	7
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	5	7	37	100	5	7
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	38	40	73	277	106	121
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	106	121	45	69	106	121	45	69	106	121
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	74	73	234	678	74	73	234	678	106	121
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	79	80	271	778	79	80	271	778	106	121
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	100	98



40 bulls:100 cows

? bulls:100 cows

? bulls:100 cows

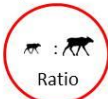
2015 suggests enough bulls to breed cows

## Composition Surveys Results- Central

Spring

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	401	58	55
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	36	33	161	401	36	33	161	401	58	55
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	5	7	37	100	5	7
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	5	7	37	100	5	7
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	38	40	73	277	106	121
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	106	121	45	69	106	121	45	69	106	121
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	74	73	234	678	74	73	234	678	106	121
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	79	80	271	778	79	80	271	778	106	121
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	100	98



30-50 calves:100 cows

30-50 calves:100 cows

30-50 calves:100 cows

Suggests good calf over-winter survival

## Composition Surveys Results- PCI

Fall

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	139	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	401	58	55
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	36	33	161	401	36	33	161	401	58	55
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	5	7	37	100	5	7
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	5	7	37	100	5	7
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	38	40	73	277	106	121
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	106	121	45	69	106	121	45	69	106	121
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	74	73	234	678	74	73	234	678	106	121
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	79	80	271	778	79	80	271	778	106	121
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	100	98



40 bulls:100 cows

? bulls:100 cows

? bulls:100 cows

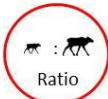
2015 suggests enough bulls to breed cows

## Composition Surveys Results- PCI

Spring

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring			
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	401	58	55
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	36	33	161	401	36	33	161	401	58	55
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	5	7	37	100	5	7
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	5	7	37	100	5	7
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	38	40	73	277	106	121
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	53	600	38	73	53	106	121	45	69	106	121	45	69	106	121
Bull + Cows	153	68	315	110	92	532	373	148	322	184	7	484	430	213	74	73	234	678	74	73	234	678	106	121
Adults + Yearlings Observed	153	68	315	110	102	608	402	148	364	207	7	541	505	230	79	80	271	778	79	80	271	778	106	121
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	100	98



30-50 calves:100 cows

30-50 calves:100 cows

30-50 calves:100 cows

Suggests poor calf over-winter survival



## Composition Surveys Results- South

Fall

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015 Fall				2016 Spring				2016 Fall				2017 Spring				2017 Fall				2018 Spring				
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	401	39	39	
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	58	55	19	277	106	121	46	69	68	68	
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	38	40	73	277	45	69	
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	38	40	73	277	45	69	
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	106	121	46	69	68	68	
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	32	184	7	484	430	213	74	73	234	678	79	80	271	778	302	933
Bull + Cows	153	68	315	110	Not completed	608	402	148	364	207	7	541	505	230	Not completed	Not completed	Not completed	778	100	98	302	933	302	933	
Adults + Yearlings Observed	153	68	315	110	Not completed	608	402	148	364	207	7	541	505	230	Not completed	Not completed	Not completed	778	100	98	302	933	302	933	
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	302	933	



40 bulls:100 cows

40 bulls:100 cows

? bulls:100 cows

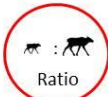
2015 and 2016 suggests enough bulls to breed cows

## Composition Surveys Results- South

Spring

Table 4 Number of observed caribou by demographic group during Baffin Island composition surveys 2015-2018.

Year Season	2015				2016				2016				2017				2017				2018				
	Fall				Spring				Fall				Spring				Fall				Spring				
Location	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	North Baffin Island	Central Baffin Island	Prince Charles Island	South Baffin Island	
Calves Observed	55	28	133	49	23	82	49	54	81	47	1	114	92	86	21	18	31	155	36	33	161	40	39	39	
Cows Observed	77	39	189	64	67	328	222	94	196	120	1	351	249	139	58	55	19	277	106	121	46	69	68	68	
Calves/100 Cows	71	72	70	77	34	25	22	57	41	39	100	32	37	62	5	7	37	100	38	40	73	277	45	69	
Yearlings Observed	N/A	N/A	N/A	N/A	10	76	29	N/A	42	23	0	57	75	17	5	7	37	100	38	40	73	277	45	69	
Bulls Observed	76	29	126	46	25	204	151	54	126	64	6	133	181	74	38	40	73	277	106	121	46	69	68	68	
Bulls/100 Cows	99	74	67	72	37	62	68	57	64	32	184	7	484	430	213	74	73	234	678	79	80	271	778	302	933
Bull + Cows	153	68	315	110	Not completed	608	402	148	364	207	7	541	505	230	Not completed	Not completed	Not completed	778	100	98	302	933	302	933	
Adults + Yearlings Observed	153	68	315	110	Not completed	608	402	148	364	207	7	541	505	230	Not completed	Not completed	Not completed	778	100	98	302	933	302	933	
Total Observed (Calves, Yearlings and Adults)	208	96	448	159	125	690	451	202	445	254	8	655	597	316	100	98	302	933	100	98	302	933	302	933	



30-50 calves:100 cows

30-50 calves:100 cows

30-50 calves:100 cows

Suggests good calf over-winter survival

## Composition Surveys 2019 Spring

Currently planning logistics for spring surveys in March/April 2019

Planning for south and central Baffin

In discussions with Baffinland regarding support for north Baffin

## **Working Together to Monitor Caribou on Baffin Island**

### **– Planning For Recovery**

## Aerial Surveys

- Offer the most unobstructed viewing of caribou.
- Can cover large areas.
- Can be used to determine population trend.
- Can be used to estimate populations.
- Can be used to document large distributional shifts.

## Composition Surveys

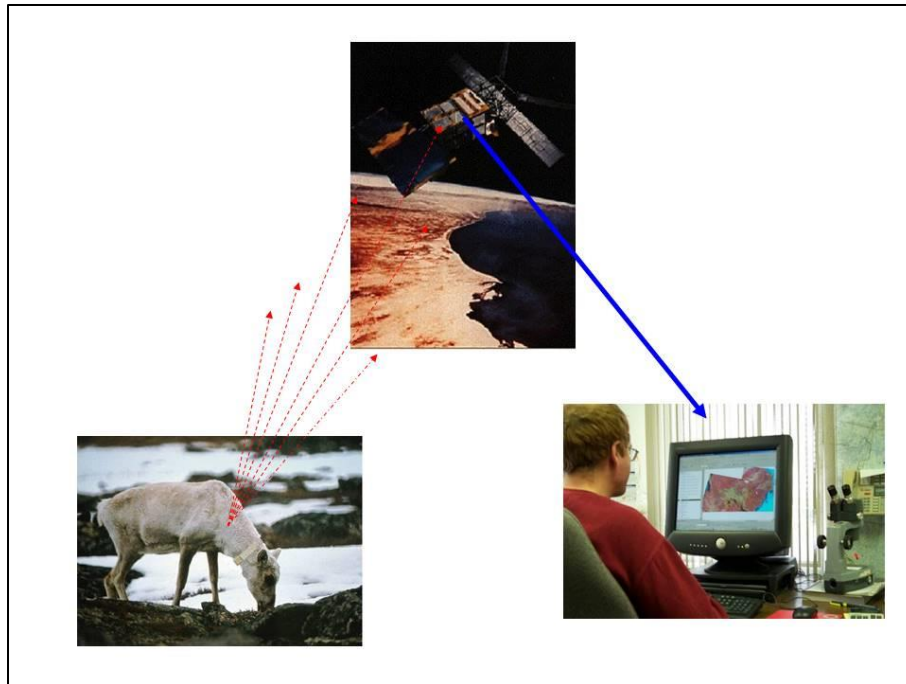
- Can be expensive
- Can be used as an index of population trend.
- Can be used to trigger more costly aerial surveys.
- Monitors changes in gender related survival.
- Provides an index of productivity.



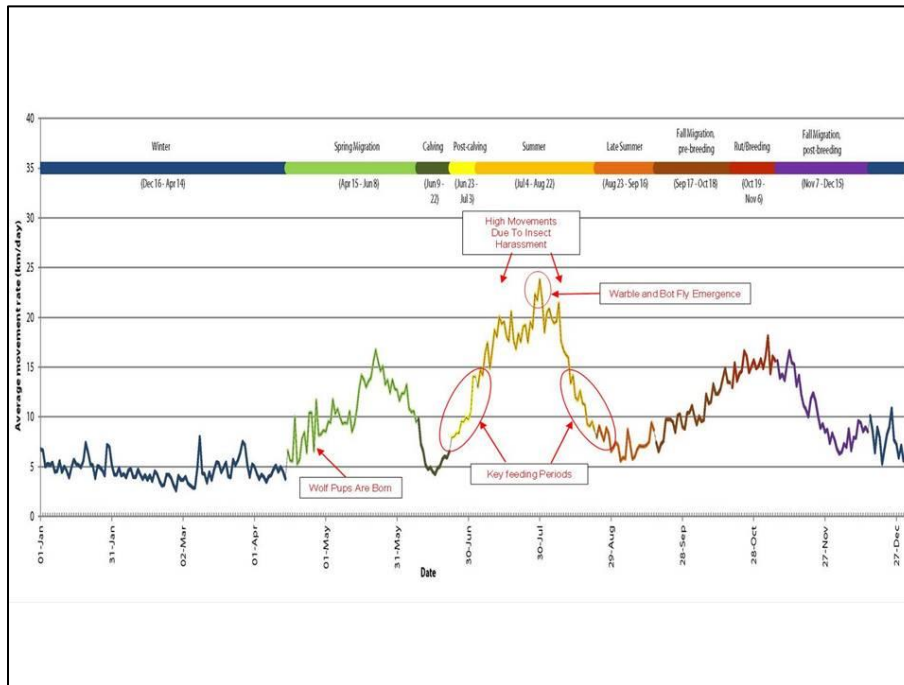
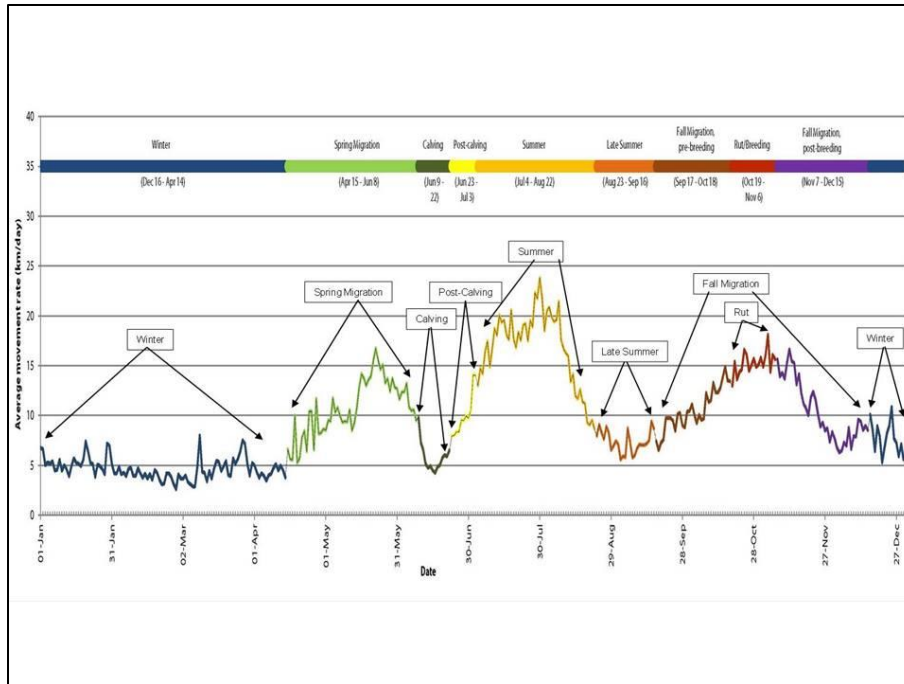
## Telemetry Studies

- Cost Effective.
- Dramatically lowers the cost of aerial and composition surveys.
- Can be used to determine herd annual range.
- Can be used to determine seasonal range.
- Can be used to guide aerial survey efforts.
- Can be used to determine critical habitat.
- Can be used to protect critical habitat.

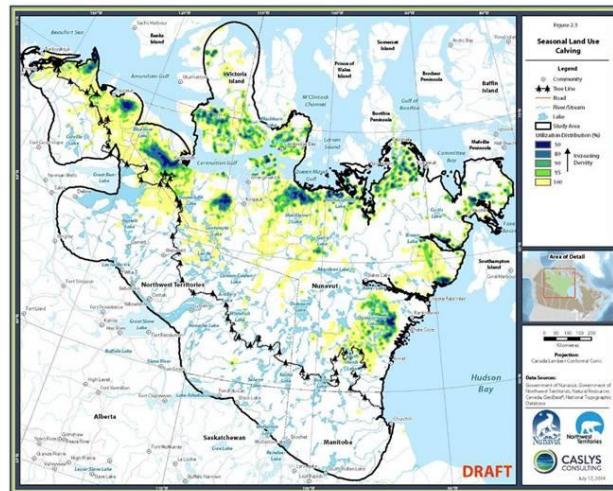


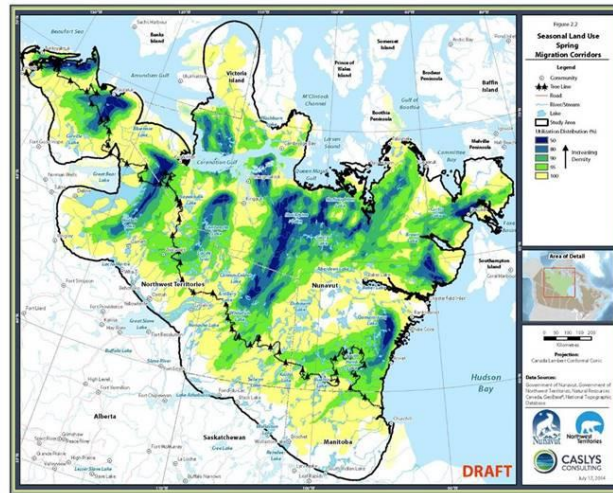


How Telemetry is being used

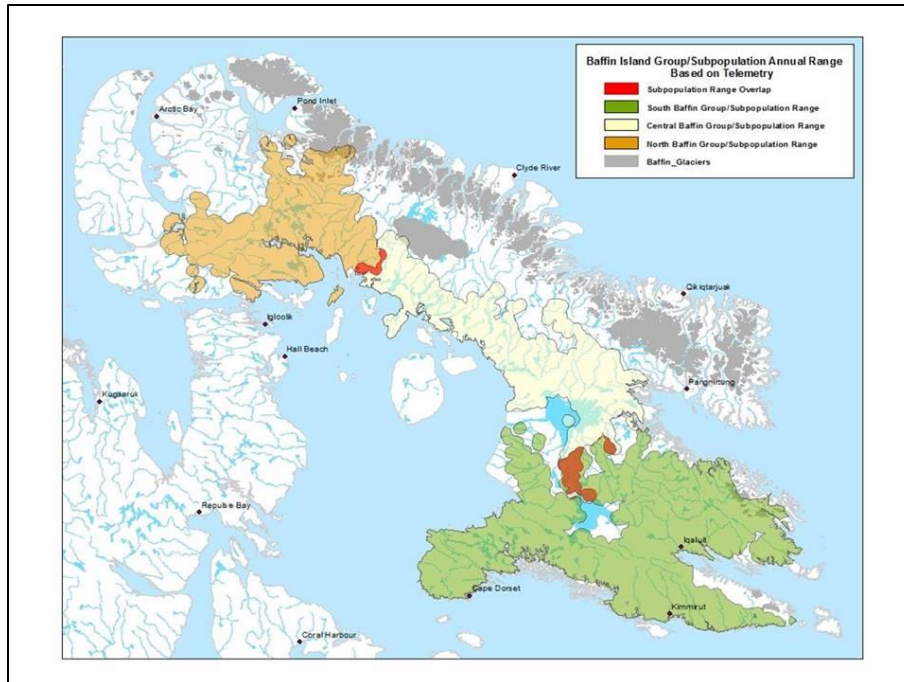


# Determining Seasonal Range



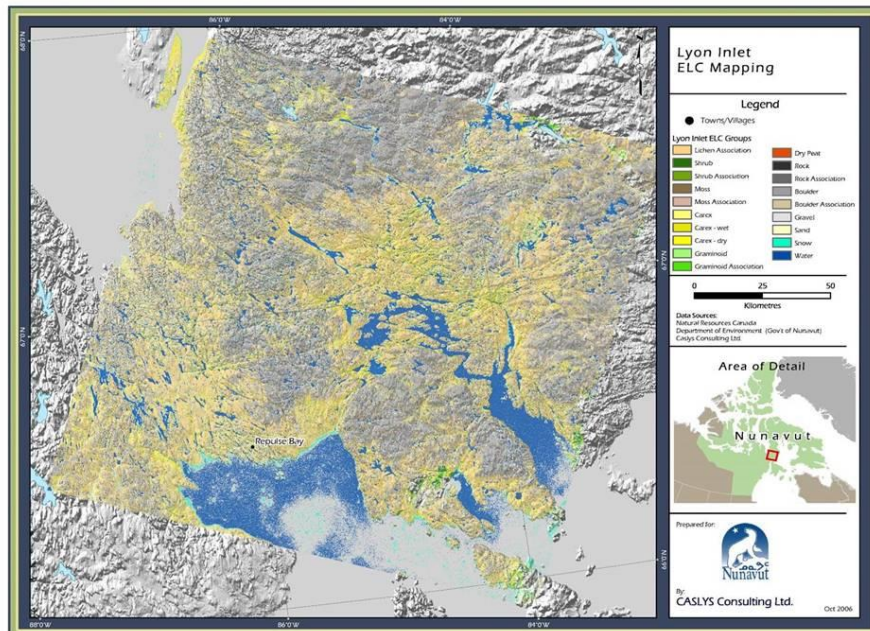
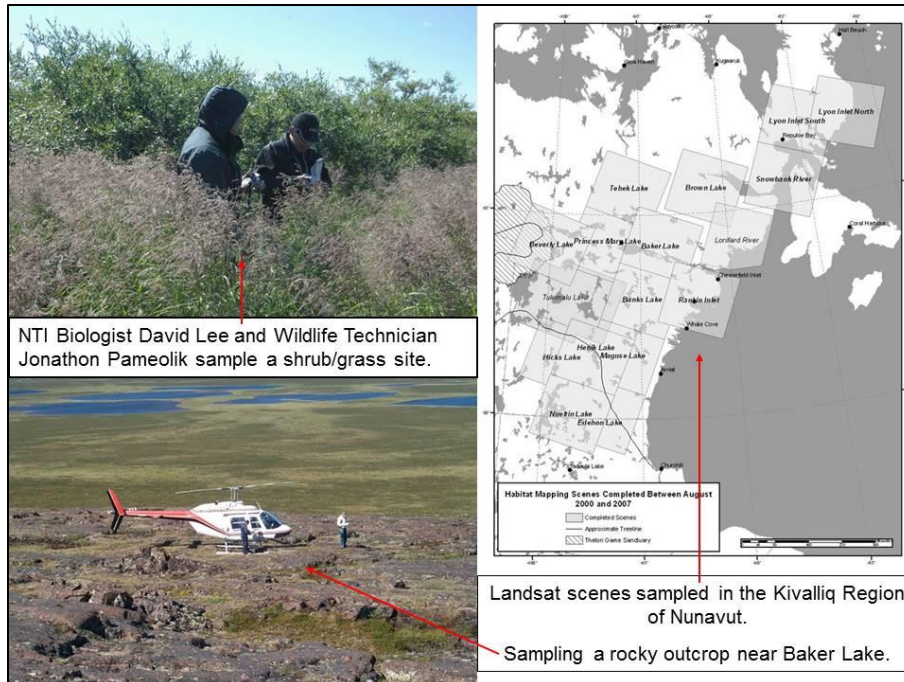


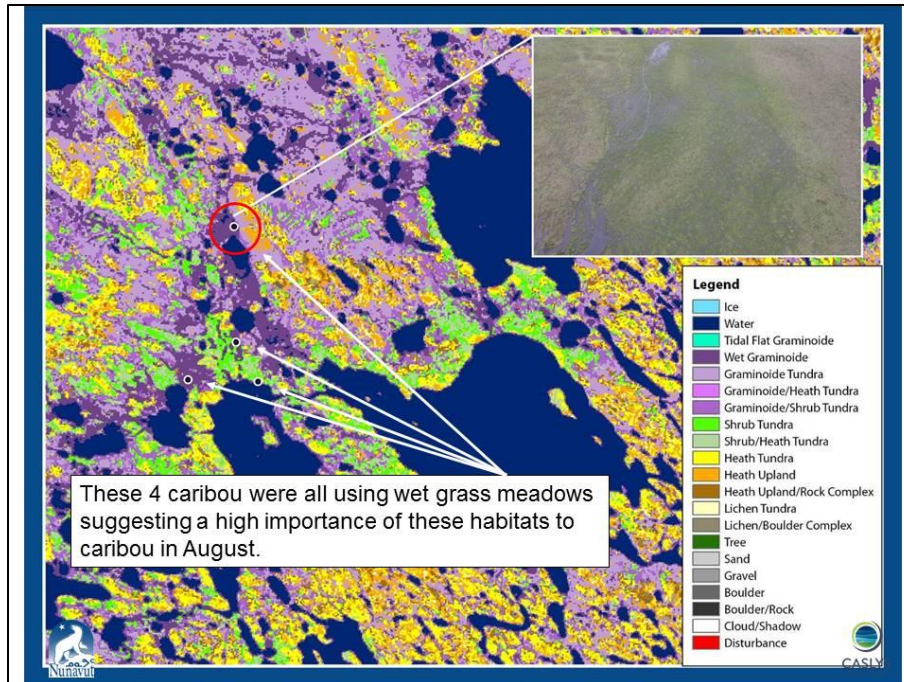
## Herd Delineation



## Ecological Studies



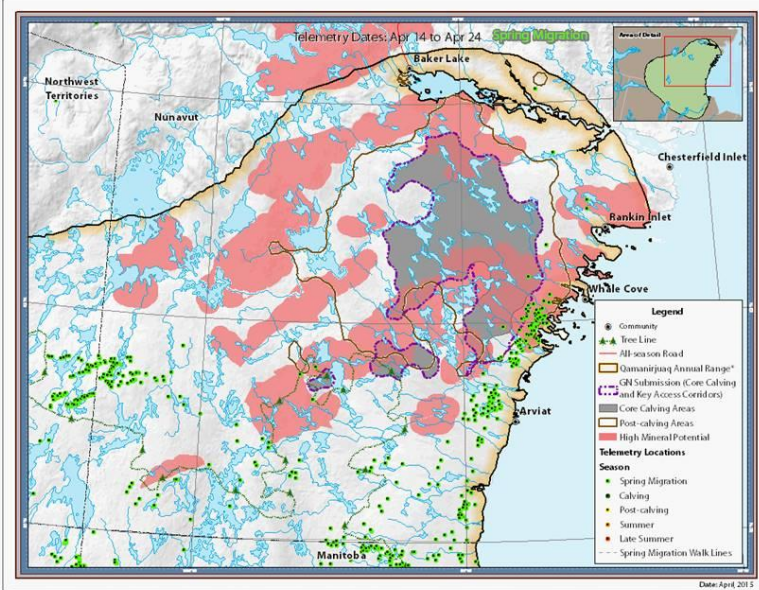




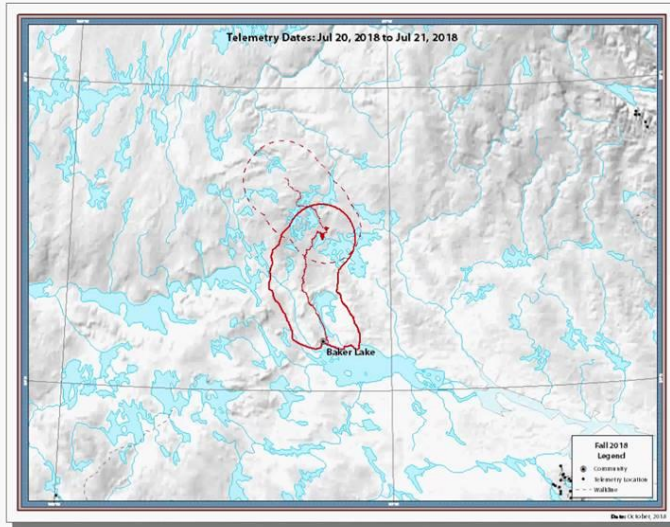
## Protecting Caribou From Development



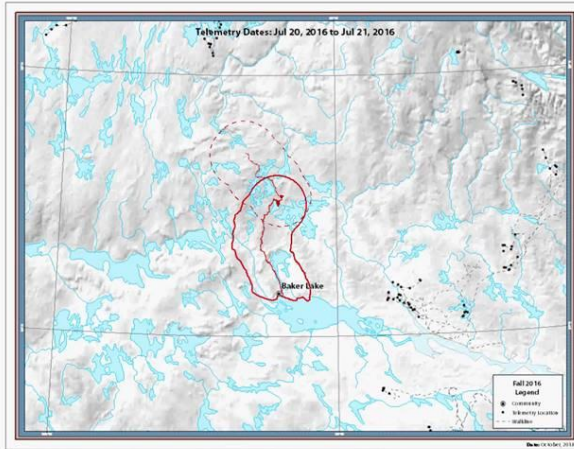




2018



2016



Questions?

A wide-angle photograph of a sunset or sunrise over a calm body of water. The sun is a bright, glowing orb in the upper right quadrant, partially obscured by thin, dark clouds. Its light reflects on the water's surface. In the distance, a dark, silhouetted coastline with hills or mountains is visible on the left side. The water in the foreground is dark and textured with small ripples. The overall mood is peaceful and contemplative.

# Draft Management Plan

Sent to HTO in September 2018

We want to know community concerns, questions and comments

GOVERNMENT OF NUNAVUT: DEPARTMENT OF ENVIRONMENT

**Baffin Island Caribou Management Plan**

Working together to ensure Baffin Island caribou harvest is sustainable

GN DOE  
July 2018

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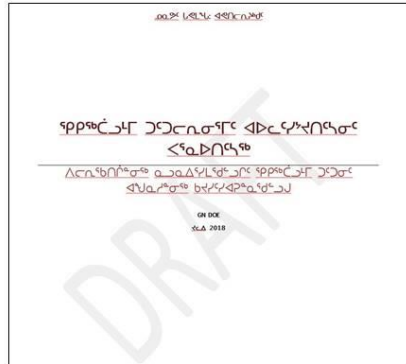
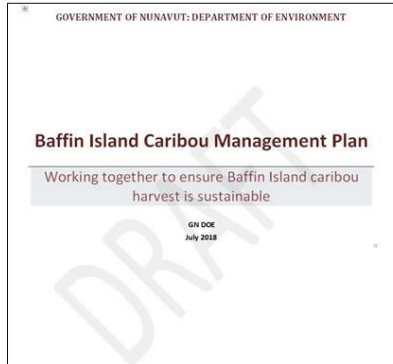
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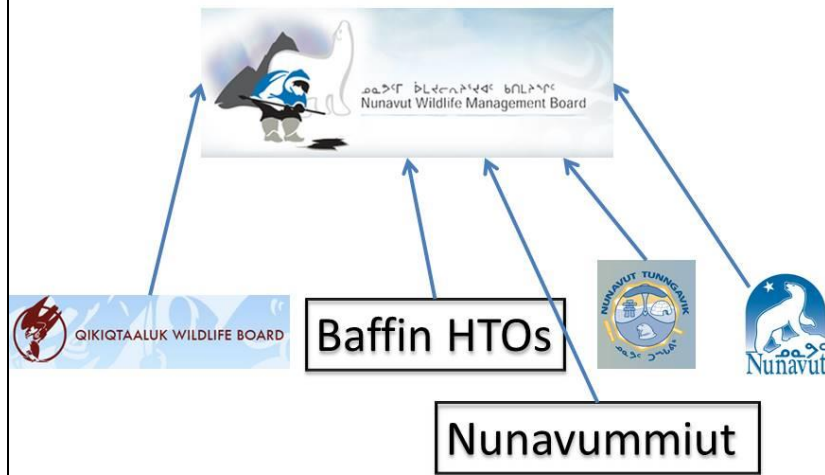
GN DOE  
JULY 2018

We want to know community concerns, questions and comments

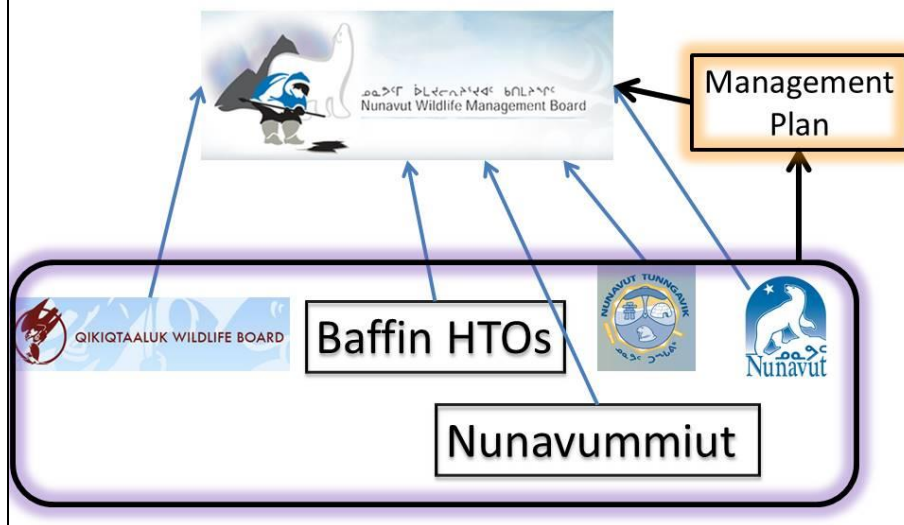




## Department of Environment Role



## Department of Environment Role



## What if something changes?

- Plan updated if there is new information
  - Status of caribou
  - Status of harvest management
  - Status of monitoring
- Complete review every 10 years
  - Next major revision (2028)

## Questions

