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Building *Nunavut* Together
Nunavut liuqatigiingniq
Bâtir le *Nunavut* ensemble

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Department of Environment
Avatiliqiyikkut
Ministère de l'Environnement

M'CLINTOCK CHANNEL POLAR BEAR SCIENTIFIC STUDY RESULTS

Consultations October 19-21, 2020

Consultation Summary Report

Polar Bear Research Group
Department of Environment
Government of Nunavut
Igloolik, NU

Executive Summary

Government of Nunavut, Department of Environment (DOE) representatives, together with representatives from the Kitikmeot Regional Wildlife Board (KRWB) conducted consultations with Hunters and Trappers Organizations (HTOs) from October 19-21, 2020. The purpose of the consultations was to provide co-management partners with an overview of the most recent scientific study results on the M'Clintock Channel (MC) polar bear subpopulations, as well as collect feedback on the results presented and collect additional traditional knowledge (TK). Only the HTOs in communities that hunt from the MC subpopulation were consulted. The feedback and TK collected during these consultations will be considered when forming Total Allowable Harvest (TAH) recommendations for the MC subpopulation to be submitted to the Nunavut Wildlife Management Board (NWMB) for decision. This report attempts to summarize the comments made by participants during the consultations.

Contents

Executive Summary	2
Preface	4
1.0 Report Purpose and Structure	5
2.0 Purpose of Consultations	5
2.1 Format of Meetings	5
3.0 Summary by Community	6
3.1 Cambridge Bay Consultation Summary	6
3.2 Gjoa Haven Consultation Summary	7
3.3 Taloyoak Consultation Summary	7
4.0 Overall Consultation Summary	8
Appendix 1: Complete Consultation Presentation of the M’Clintock Channel Polar Bear Study Results 2014-2016	10
Appendix 2: Complete Consultation Summary of the M’Clintock Channel Community Consultations	21
A: Cambridge Bay	22
B: Gjoa Haven.....	30
C: Taloyoak.....	38

Preface

This report represents the Department of Environment's best efforts to accurately capture the information that was shared during consultation meetings with the Hunters and Trappers Organizations of Cambridge Bay, Gjoa Haven and Taloyoak. The views expressed herein do not necessarily reflect those of the Department of Environment, or the Government of Nunavut.

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 results from the 2014-2016 MC scientific study. Pre-study consultations with these communities were conducted in 2013.

The following communities were consulted from October 19-21, 2020:

- Cambridge Bay, October 19, 2020
- Gjoa Haven, October 20, 2020
- Taloyoak, October 21, 2020

During the meetings DOE provided input on what the GN's TAH recommendation would be for MC. Representatives from the NWMB, Nunavut Tunngavik Inc. (NTI) were invited to these meetings but unfortunately no representative was available to participate in person. A representative from the Kitikmeot Regional Wildlife Board (KRWB) was in attendance in Cambridge Bay and Kugaaruk (Note: The GN representatives presented the MC results to the KRWB representative in Kugaaruk after a presentation was given on Gulf of Boothia results in that community because the KRWB representative was unable to attend the Gjoa Haven and Taloyoak meetings).

2.0 Purpose of Consultations

The purpose of these consultations was to discuss the newest scientific information regarding the MC polar bear sub-population as reported in the GN scientific study report produced by the GN polar bear biologists. In addition, the GN also put forward a TAH recommendation during these consultations, but also discussed that management objectives can be formulated depending on the communities' needs and objectives for this subpopulation.

2.1 Format of Meetings

The meetings were held in the evening (e.g., beginning between 17:00 and 18:30) and ran between 3 to 4 hours depending on HTO engagement. Meetings were facilitated and led by GN Polar Bear Biologists M. Dyck and J. Ware, who also presented. The biologists presented the historic management background, and a detailed overview of the results from the 2014-2016 polar bear study conducted in MC (Appendix 1). The participants were invited to ask questions, raise concerns, or provide recommendations throughout the meetings. It was also pointed out that there is still the on-going MC TK

study in which results are expected by the end of 2020, depending on how the COVID-19 pandemic evolves.

After the presentation, questions/discussion continued until no further questions were raised. At the end of the meeting, the GN position on the TAH for MC was presented. In addition, it was also mentioned that the GN position not necessarily reflects the Management Objective goal of the communities and communities were encouraged to work with the KRWB and/or the GN to work on the development of a Management Objective for the MC subpopulation. The biologists explained that consideration for a TAH that differs from the GN recommendation should include the uncertainty of the results, the changing environment, and the past where a moratorium was in place that was followed by a reduction in TAH. Discussions and questions were raised regarding the tag distribution in Gulf of Boothia (GB) and MC for communities that harvest from both subpopulations. The biologists advised the participants that this is a matter for the KRWB to consider as tag allocation within a subpopulation falls under their purview.

3.0 Summary by Community

The objectives of the consultation meeting 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 the communities consulted. A full, detailed report of the questions and comments from each community can be found in Appendix 2.

3.1 Cambridge Bay Consultation Summary

Date: October 19, 2020

Time: 18:15 – 22:20

Representatives:

- GN-DOE, Polar Bear Biologists M. Dyck, J. Ware
- GN-DOE, Conservation Officers M. Angohiatok, S. Angulauk
- GN-DOE, Regional Manager, K. Methuen
- KRWB, Chairperson: B. Klengenberg
- Cambridge Bay HTO Board Members

Comments and Questions:

The board members wanted to get more clarification on the new harvest system according to the Nunavut Polar Bear Co-Management Plan, and they needed additional information on the harvest table and credit use. Overall, the board members were in agreement that there are more bears now than 20 years ago, and that bears are

healthy. Concerns were raised that the distribution of tags for GB and MC are not distributed fairly, especially now that MC shows an increase. It was suggested by the GN representatives to bring this up with the KRWB. The board was thankful and appreciative that the GN visited the community to present the results and to have a discussion.

3.2 Gjoa Haven Consultation Summary

Date: October 20, 2020

Time: 18:50 – 21:15

Representatives:

- GN-DOE, Polar Bear Biologists M. Dyck, J. Ware
- GN-DOE, Conservation Officer J. Skilling
- GN-DOE, Regional Manager, K. Methuen
- Gjoa Haven HTO Board Members

Comments and Questions:

After the presentation about MC, board members discussed their experiences from over the past years and how they lined up with the GN study results. Generally, the board members agreed with the GN findings. It also became clearer by comments from board members that Gjoa Haven hunters are not hunting much in GB. Some points were raised that the distribution of tags for GB and MC are not distributed fairly, especially now that MC shows an increase. It was suggested by the GN representatives to bring this up with the KRWB. There were also concerns from hunters that Taloyoak uses their MC tags to cover problem bears in the overlap area of the subpopulation boundaries. The board was thankful and appreciative that the GN visited the community to present the results and to have a discussion. Some clarity was provided on how the BEARWATCH project and, individuals associated with the project, relate to the GN.

3.3 Taloyoak Consultation Summary

Date: October 21, 2020

Time: 17:45 – 20:15

Representatives:

- GN-DOE, Polar Bear Biologists M. Dyck, J. Ware
- GN-DOE, Conservation Officer D. Anavilok
- GN-DOE, Regional Manager, K. Methuen
- Taloyoak Spence Bay HTO Board Members

Comments and Questions:

After the presentation about MC, board members discussed their experiences from over the past years and how they lined up with the GN study results. Generally, the board members agreed with the GN findings. It also became clearer by comments from board members that Taloyoak hunters are not hunting as much in MC, although some comments were in conflict with that sentiment, and perhaps some hunting in MC by Taloyoak is preferred. Some points were raised that the distribution of tags for GB and MC are not distributed fairly, especially now that MC shows an increase. It was suggested by the GN representatives to bring this up with the KRWB.

4.0 Overall Consultation Summary

The consultations for all communities harvesting from MC were conducted in a roundtable, open discussion format in which all participants were able to provide feedback, ask questions, and speak. Participants offered context and understanding to the scientific results. The major points raised by communities regarding MC were:

- 1) agreement with the scientific findings that the population appears to have increased since the last scientific study in 1998-2000, and
- 2) MC tag allocation is a major concern.

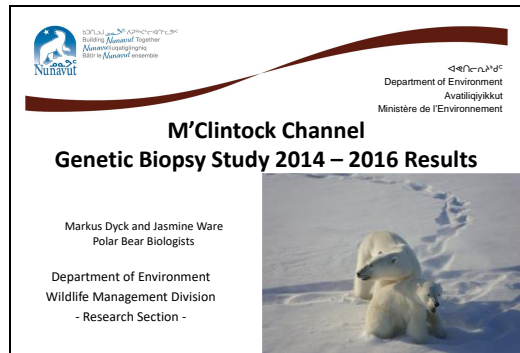
Minor points, which represent comments by some communities but not all, included wanting clarification on the new 1:1 harvest management system and credit usage and questions as to why DNA biopsy methodology takes longer than traditional mark-recapture to complete.



The GN proposed an increase in TAH for MC to 16 bears at a 1:1 male-female sex ratio based on the scientific findings of an increased population. The TAH was increased to 12 in 2014/2015 based on Inuit Qaujimagatuqangit (IQ) observations of an increased population and the scientific results align with these data. There is an ongoing IQ study for MC which may offer more comprehensive insight into hunters' and users' observations of bear distribution or abundance. Given the overall community consensus that they agreed with the findings, there were no major oppositions to this proposal. However, communities pointed out that 16 tags could not be divided evenly among the three communities currently harvesting from MC. One of the major points was that the tag allocation needed to be revisited to ensure fairness and equity among the communities that harvest from MC. This was raised most emphatically by communities that were harvesting from both MC and GB populations, with a range of attitudes towards harvesting from GB. Some communities indicated willingness to forgo GB harvest in order to harvest additional bears from MC, while other communities felt GB areas were more important. These concerns of fair and equitable tag distribution, which necessitate review and action by the RWOs, were a major topic of discussion for MC

harvesting communities. The GN representatives discussed roles and responsibilities of the relevant bodies for tag allocation outlined the process via the RWOs. The GN offered to provide guidance or further information to any interested community.

Appendix 1: Complete Consultation Presentation of the M'Clintock Channel Polar Bear Study Results 2014-2016

Slide 1




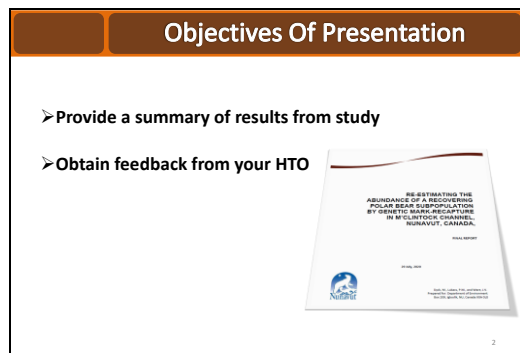
**M'Clintock Channel
Genetic Biopsy Study 2014 – 2016 Results**

Markus Dyck and Jasmine Ware
Polar Bear Biologists

Department of Environment
Wildlife Management Division
- Research Section -

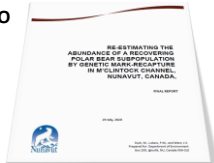


Slide 2



Objectives Of Presentation

- Provide a summary of results from study
- Obtain feedback from your HTO

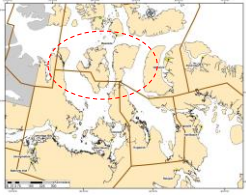


2

Slide 3

Background

- First mark-recapture study between 1973-78
 - MC and GB treated as one unit, estimate of 1,081
- GB estimate increased to 900 in mid-90s based on local knowledge and uneven and incomplete sampling
- MC estimate decreased from 900 to 700 based on local knowledge in mid-90s
- Population boundaries in 1995 and 2001

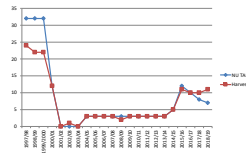


3

Slide 4

Background – Harvest

- Concerns over low bear densities in MC lead to new mark-recapture study 1998-2000; GB also included in the work.
- Estimate for MC was 284
- Average harvest of 34 bears/year from 1979-1999 for MC
- MC harvest unsustainable:
 - a) hunting moratorium 2001-2003
 - b) TAH of 3 until 2015/16
- MC population likely growing
- TAH of 12 since 2016



4

Slide 5

Background – Where does that bring us?

- Population status unknown (stable? increasing?)
- Population boundaries of MC/GB/LS?
 - Inuit Qaujimagatuqangit/genetics suggest movement between both units

5

Slide 6

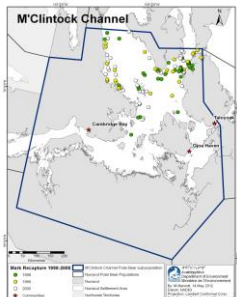
Goals of study

- Need for new information – current data was deficient
 - Re-assess population abundance
 - Evaluate population boundaries/movements of bears
 - Provide information for review of Total Allowable Harvest (TAH)
 - Observe effects of changing sea-ice conditions

Slide 7

Study method choices

- Co-management partners indicated concern about drugging & handling bears
 - Explore alternative population assessment methods
 - Better reflect Inuit societal values
- Balance with analysis needs –to properly monitor population




Slide 8

Study method chosen

➤ Co-management partners and GN selected less invasive choice:

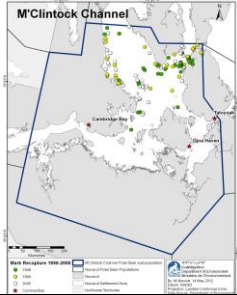
Genetic mark-recapture (biopsy sampling, no physical handling)



Slide 9

Genetic capture mark-recapture study goals

- Estimate polar bear abundance in MC
- Compare with 1998-2000 estimate
- Compare information on reproduction, survival
- Cannot estimate movement or boundaries with this method



The map shows the M'Clintock Channel area with various sampling locations marked by green dots. A legend indicates different types of boundaries and sampling areas. The map includes a scale bar and a north arrow.

Slide 10

Study funding and support




Logos for the following organizations are displayed: Nunavut Wildlife Management Board, Nunavut Government, Environment and Climate Change Canada (Environment et Changement climatique Canada), WWF, and the Nunavut General Monitoring Plan. Below the logos, it states: "HTOs from Gjoa Haven, Cambridge Bay, Taloyoak".

Slide 11

Study Design

Community Participation

- Survey design and method choice - 2013
- Survey observers – participants from Ekaluktutiak HTO and Spence Bay HTO available in 2014 and in 2015; no participants available from Gjoa Haven
- Review & evaluation of results - 2020





The image shows a vertical strip of an aerial photograph of a snowy, mountainous landscape.

Slide 12

Study Design – Data collection

- Method choice: genetic capture mark recapture
- Timing of study: mid-April to early June
- HTO participation on searching and sampling flights
- Used helicopters to search

Willy Mekashook, from Cambridge Bay, searches for bears in MC 2025.

Slide 13

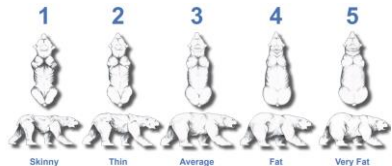
Study Design – Data collection

- Recording age class, sex, body condition, litter size, location of bears




Slide 14

Study Design – Data collection



1 Skinny
Appears extremely skinny. Pelvis and shoulder blades protruding, ribs easily felt with the hand. A deep hollow and no meat between the pelvis and tail is always clearly visible.

2 Thin
Barely discernible ribs. Pelvis easily felt with the hand. The deep hollow between the pelvis and tail is obvious, but not as deep as in the skinny bear.

3 Average
Body is fully rounded. Ribs are not visible. Pelvis is prominent over the back and shoulders. The hollow between the pelvis and tail is absent.

4 Fat
Bear has a rounded or blocky appearance, ribs are not visible. Pelvis is prominent over the back and shoulders. The hollow between the pelvis and tail is absent.

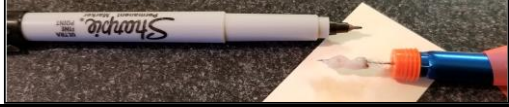
5 Very Fat
Bear is extremely stocky. Ribs appear too short for the body. Ribs of fat on neck and lower shoulders.

14

Slide 15

Study Design – Data collection

- Collected small tissue samples for genetic analysis (to genetically identify and “mark” an individual)
- No cubs-of-the-year sampled
- No drugging, no collaring
- No specific ages or samples for other studies (e.g., contaminants)



Slide 16

Study Design - Analysis

- Included all mark-recaptures and dead recoveries for analysis:
 - Genetic mark-recapture (biopsy) information 2014-2016
 - 1998-2000 capture mark-recapture information
 - Harvest recoveries (e.g., when an ear tag/lip tattoo is recovered by a hunter) 1998-2016

16

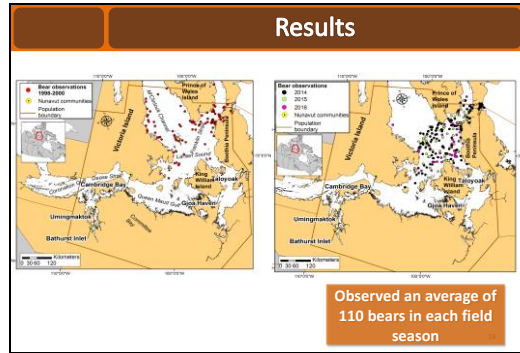
Slide 17

Analysis Goals

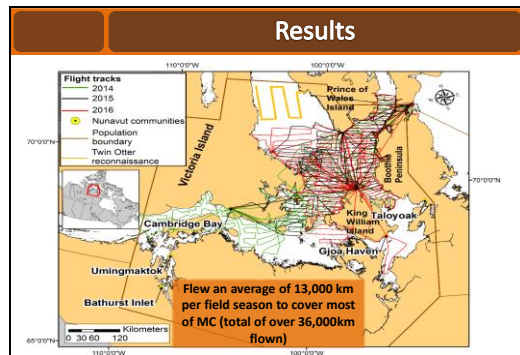
- Use all information to determine:
 1. Trends in abundance from 2000-2016
 2. Survival rates of different age classes and sexes over time
 3. Reproductive parameters such as size of litters, litter rate per adult female (how productive are the females/population)
 4. Population growth rate – determined using survival rates and litter production rates
 5. Evaluate body condition of bears across the searched MC area

17

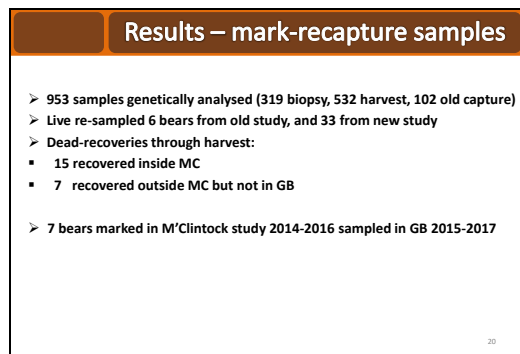
Slide 18



Slide 19



Slide 20



Slide 21

Results – body condition

- All bears except adult males were in better condition (fatter) in 2014-2016 compared to 1998-2000

1998-2000 2014-2016

- No change in condition for adult males

- Why? Your thoughts?

21

Slide 22

Results – Reproduction

- What does "reproduction" mean? What do scientists look at?
- Litter size
 - data from:

	1998-2000	and	2014-2016
➤ Cubs of the year:	12 family groups		27 family groups
➤ COY litter size:	1.58 COYS in each litter		1.70 COYS in each litter
➤ Yearlings:	11 family groups		18 family groups
➤ Yearling litter size:	1.71		1.61

22

Slide 23

Results – Reproduction cont.

- Number of offspring per adult female

<u>1998-2000</u>	<u>2014-2016</u>
COYS:	
➤ 0.38 COYS/adult female	➤ 0.43 COYS/adult female
Yearlings:	
➤ 0.39 yearlings/adult female	➤ 0.28 yearlings/adult female

 - Sample size very small to suggest changes over time – only for information
- Number of yearlings per adult female is important because it shows how many cubs-of-the-year survive to be yearlings
 - it is a good measure of reproduction
- Appears MC subpopulation has healthy reproduction

23

Slide 24

Results – Survival


- We had limited samples – MC is a small population, few recoveries through harvest, big time gap with no data – and could not explore all possible survival models
- Independent bears > 2 years
 - Apparent survival constant at 0.88
 - It is a lower estimate, and does not reflect true survival
(We do not know what happens to bears once they leave MC: they can be dead = are not re-sampled; they also can be alive and are not re-sampled)

24

Slide 25

Results – Population growth rate

- Population growth rate indicates males and females increased in abundance since 2000 (recovered from low numbers)
(growth rate is simply the difference between what is added through births minus the deaths and takes into account how animals survive)
- Male growth rate was stronger than female growth rate which allowed them to recover from overharvest



25

Slide 26

Results – Abundance

➤ Assessment of number of bears in MC

1998-2000 average

Low end

325

545

2014-2016 average

716

High end

955

Abundance estimate range

➤ Increased over time

26

Slide 27

Results – Interpretation

- MC is doing well, healthy subpopulation for now
- Because we don't have a quantifiable idea about movement, we are likely counting bears from other subpopulations like LS and MC as GB bears ➔ increases the abundance assessment.

27

Slide 28

Further Questions

- **Boundary between GB-MC-LS?**
 - Genetic mark-recapture method does not provide data to answer these questions
 - Movement data are necessary
 - How important is the boundary issue to you and other users?
 - IQ says there is movement. How much? Where? When? Which animals?
 - Are bears changing where they choose to spend their time? Is this related to sea ice changes? Seals?
- **Options:**
 - The Government of Nunavut is committed to surveying Lancaster Sound in the next few years
 - With your support, we could propose to put collars and satellite ear tags on a small number of bears in LS and MC/GB to gather info about bear movements between and among these areas.

28

Slide 29

Further Questions

- Do you agree that the number of bears increased over time?
- What did you observe in the bears' body condition over time?
- Are there enough bears to harvest? Are there too few? Too many?
- Is there anything special that you observed and wanted to share with us?
- Where do you agree/disagree with our findings?

29

Slide 30

Suggested Harvest Recommendation

- MC is doing well, healthy subpopulation for now
- Because we don't have a quantifiable idea about movement, we are likely counting bears from other subpopulations like LS and MC as GB bears → increases the abundance assessment, and uncertainty.
- Recommend increase in TAH from 12 to 16 bears/year (8 male bears and 8 female bears).

30

Slide 31

Further Questions? - Thank you

31

Appendix 2: Complete Consultation Summary of the M'Clintock Channel Community Consultations

Nunavut Community Consultations on the results from the 2014-2016 M'Clintock Channel Polar Bear Study

October 19-21, 2020

**HTOs Consulted:
Cambridge Bay
Gjoa Haven
Taloyoak**

Summary of Consultations:

A: Cambridge Bay

October 19, 2020

Start: 18:15 **End:** 22:20

Participants:

Beverly Magsagak - Manager
Bobby Greenley – Chairperson
George Angohiatok – Vice Chair
Peter Evalik – Secretary/Treasurer
Ipeelie Ootoova – Director
Clarence Kaiyogana – director
Mercy Panegyuk – director
Alice Maghagak – director
M. Dyck – GN-DOE
J. Ware – GN-DOE
K. Methuen – GN-DOE
M. Angohiatok – GN-DOE
S. Angulauk – GN DOE
Bobby Klengenberg – KRWB chair

Harvest table and credit discussion:

- The meeting began with introduction of participants.
- GN representatives then discussed harvest table and Up to 1:1 Harvest Management system handout. During meeting/consultation planning, HTO expressed interest to obtain more information on those topics. – Jasmine
- HTO board asked questions about credits and the table. Board was well informed about how the credit exchange worked within the subpopulation.
- Markus explained fractional credits are from 2:1 system

Main presentation:

Background on MC slides:

- GN representatives went over MC history and background to allow HTO representatives to become familiar about past research and management items

- GN representative passed around the biopsy dart to demonstrate how the biopsy method works, pros and cons and limitations of that method.
- **Question: Bobby G:** would you dart both mom and cub if you came across them?
- **Answer Markus** – we'll answer this in the methods very shortly (GN explained that depending on offspring age both mother and offspring would be sampled – no young small bears->COYs in spring, but older offspring-> yearlings).

Community participation slides:

- discussed study design during 2013 consultations, talk with hunters in town – where do bears go, when should we go search. Observers from Cambridge Bay participated in field work.

Study design: reviewed slides; no questions

- **Question Bobby G:** – were there any bears that were marked in 1998-2000 that were marked again in 2014-2016?
- **Answer Markus/Jasmine** – yes
- George: In the mid 1960's, was the first time I went in M'Clintock channel, there was no quota system and there were very, very few bears. No signs either. Took a lot to get bears. As the years went on, started noticing more and more bear-- Lots of bearded seals around. Big bears are around the bearded seals and feed on them. In the last few years, I've seen many healthy bears, sow and cubs. This year was the very first time in March I saw open water---never seen that in my whole life. Birds were there too. Lots and lots of sign of bear. Pre-2000 started seeing more bear sign. Ten to twenty bearded seals around a single hole, big male bear can get those pretty easy when the seals try to go into a seal hole.
- Bobby K: end of October, near Kent Peninsula, south of Cambridge Bay, polar bears were spotted, which is very rare.
- Beverly – there was one in gravel pit area in June and then another one just a week ago.
- Bobby K – using the multi year ice to come in and near, large floes

Flight path slide:

- Markus explained that weather prevented coverage of MC channel proper. Maybe local knowledge could fill this information in. Maybe with Pam (the

contractor for the on-going IQ study on MC and Gulf of Boothia) the IQ study can help answer that question of whether there are a lot of bears in that area in the spring. The flight with Twin Otter was early April, but don't know what's going on in early June.

- Bobby G: they didn't want to have collars which I agree with and when I first got on, they didn't have an ear tag.
- **Question Bobby G:** - Is there anything long term, short term effects of immobilization on the bear?
- **Answer Markus** – There are advances in the drugs—there are reversals now. Immobilize the animal but you can introduce agents that reverse the effects and so the bears recover way faster – within minutes.
- Bobby – so there is nothing left long term effects?
- Markus – Health Canada has looked at how fast the drugs are metabolized and found it's completely safe after 45 days---even before, but they are being conservative. Other studies, by US Fish and Wildlife Service did studies examining movement rates, survival rates, reproduction – there were no negative impacts they could find on survival or reproduction. Movement rates were back to 95% of normal after 2 days and 100% after 5 days.
- Jasmine – reversals bind to the drugs and pull them off the receptors so the liver/kidney can process. Bear is awake very fast. Physically, no long-term effects, but we have heard concerns about psychological trauma and can't really say about that being a long-term effect? We can't really say. Drugging over and over and over would probably have long term effects---like us if we drank and drank and drank alcohol. Even for the 2-minute darting the bear is not enjoying that event, but the idea is that in order to collect the data, these are the trade offs and what we (as co-managers) are all willing to accept is a personal, ethical question. We find that bears return quickly to where they were sampled and take that to mean that the experience wasn't so bad psychologically that they stay away from where they want to be –their preferred habitat/hunting ground.
- Markus – there are also new release mechanisms for collars so that bears do not have to be handled so often, and release is pre-programmed.
- George – The collars likely don't really affect hunting as much for bigger bears as they do for smaller bears ---trouble to break the ice with their heads
- **Question Peter** – could we not use the Google Earth satellite images and count bears that way?

- **Answer Markus** – very good points and questions: GN has partnered with universities and people are trying to examine just that. Using summer and spring satellite images, there are at times difficulties when there are white rocks – can't tell the difference; a computer program, or algorithm has to be developed, that takes time and patience.
- Jasmine – and this is where big donors come in---that technology is a good potential, but need money to pay people to work on it and develop it. My understanding is that this is the current obstacle because it takes time and effort to work on developing it and program it properly.

Body condition slides – thoughts on why body condition improved?

- Bobby – did you guys look at weather and see if there were differences in warmth and seals—more seals out basking?
- Markus – We kind of did that with the model where we incorporated sea ice because there is a lot less multi-year ice in MC now....what I've seen was lots of rubble ice and the packed to old ice is gone. What we were thinking and what we proposed in the report, is that the changes in sea ice, not being packed, more leads, more open water was good for seals and therefore temporarily good for bears.
- George: another thing is that when the sea ice freezes and freezes flat, this is not good habitat for bearded seals ---go to rough ice to find the bears cause that's where seals make their lairs.

Reproduction --- explained the slides; no questions

Survival --- explained the slides; no questions

Population growth – explained slides; comment by George about the skinny bear picture from Baffin Bay by some people that made the rounds around the world.

- Markus – That brings up a good point and is maybe a good time to point out part of my job is to gather data and provide information that allows me, Nunavut, and Canada to stand up to those organizations to are showing misinformation about bears. We try to get the word out that bears in Nunavut generally are doing well, and that there are more bears now than there have been since the 1960s.

Abundance – explained slides; also the surrounding uncertainty of the estimate

- **Question Peter** – Where do we want this population to go? Do we let it keep increasing? How do we know? What does an ever-increasing population do to other parts of the ecosystem?

- **Answer Jasmine** – this is the real question and one that community and HTO have to decide.
- **Answer Markus** – had discussions with DFO to try and get some seal surveys so that some of those impacts on other parts of the ecosystem can be answered or at least some data provided. Want to see recent estimates of polar bear abundance coordinated with new seal studies.
- Peter – like ECCC saying polar bears are declining due to climate change ---but polar bears are increasing and increasing even though sea ice is declining—even what you show.
- Markus – These reports for MC and GB are used for SARA and new population assessments; and not all NU populations are doing poorly, but some are not doing well. I should point out that in the recent years ECCC has been supporting Nunavut with the new management plan, and the harvest system.
- **Question Bobby G** – after the tour, when does this end up at NWMB table?
- **Answer Markus** – we will probably put our recommendation to the NWMB for March because deadlines for December are likely already passed by the time we get through the consultations
- **Question Beverly** – have you looked at other species for the bear? Like the invasive species such as beaver, pelican, etc. and how they might be affecting bears?
- **Answer Markus** – There are some projects going on like poop and intestine collections and collaborations with other universities that are designed to see how diet is changing with bears. The NWMB has priority meetings every few years---should be coming up next year – HTO or RWO should bring up these questions as priorities because that is how funding might get allocated.
- George – you were saying how difficult it was to count the bears due to weather. When my daughter got at a John Hackett Island (correct location name?) on a pressure ridge –never seen so many bears in one spot. Counted 13 bears--May 2nd. A good percentage were sows with cubs. All moving east on the ridge.
- **Question Peter** – have you thought using a ground survey –in the area that was hard to survey?
- **Answer Markus** – We are starting Lancaster Sound next spring hopefully, what I'm going to do is fly into M'Clintock Channel during the same time for a reconn. I

want to know what is going on in the area and if bears are moving, we are going to sample bears that are moving in and out. there is some uncertainty

- **Answer Jasmine** -- specifically to your point about ground surveys...the issue is that for the survey to work, every bear in the area has to have an equal chance (theoretically) of being sampled. This detection probability is different between an aircraft and ground based. Unfortunately, the math doesn't know how different those two types of methods are and so we can't combine them without introducing more bias into the model...which increases uncertainty about the estimates even further.
- Markus – a ground survey in some of these areas are also very difficult because you cannot travel easily by snow machine; get stuck, break equipment and that limits the usefulness of ground survey.
- Monica – the area you talk about there is open water now and maybe there are animals moving in like killer whales ---they chase the seals away. That will change things for the polar bears.
- Markus – Local knowledge like this should drive the IQ research questions. That's what we have to consider in the abundance estimate---think about that ecosystem might change for the bears and how that might affect them—what happens in 5 to 10 years?
- **Question Bobby G:**— these studies were done in 2014-2016; how come these are just now being presented?
- **Answer Markus** – Thanks for this question and it needs to be asked. These biopsy studies that rely on DNA take much longer because the DNA takes 9-10 months to get back and then, for MC, the computer models were difficult with such small samples. Followed by ransomware and COVID-19. It's been a long road and we appreciate your patience.
- **Question Clarence**— What's your plan if you get MC bears in LS?
- **Answer Markus**—depends on how many we get. If we get many samples, we're going to try to analyze the complex together MC/GB/LS ---this might give us more information about their movements and that might help improve survival estimate. We did leave it open for collars for the communities in Lancaster Sound. Whenever there is interest by communities if you want to investigate the LS/MC/GB, we can always investigate movement through collars.
- Bobby Klengenberg – thanks for HTOs work and biologists' work. Saw hundreds of polar bear tracks. Maybe HTO could use locals to get information of

observations –feed to HTO and biologists. Signs of tracks and information to help feed the understanding of the whole picture; maybe take also photographs as record.

- **Question Ipeelie** – do you have any idea of what proportion of bears are in water versus land? Is there a way to compare the samples between ice and land bears? There are some bears that rarely leave the water, they are found all year in water.
- **Answer Markus** – We try to cover the entire study area, but when there is open water, there are safety concerns so we can't fly over tons of open water. We will dart in water, and can do it, but there is no way to know how long that bear has been in the water, and pilots do not want to fly lots over open water.
- Ipeelie – Reason I was asking is that bears that are in the water eat differently than bears that spend most of their time on land. Wondering if you ever thought of biopsy sampling those versus the land bears? Some bears might end bowhead whales.
- Markus – we use the fat from biopsy samples to see what they're eating but there isn't really a way to know which samples would be from bears that spend a lot of time in the water versus those that spend most time on land.
- **Question Peter** – going back to LS study, you said your biopsy might get MC bears --- if you find that there a lot of MC in LS...would that help increase the TAH?
- **Answer Markus** – I would not be comfortable saying that that would increase the TAH, but if there is more new information, then that could put more information to NWMB and let them decide. But, ultimately, we don't know and we don't know what we'll find.
- **Question Peter** – how do we know there are not lots of bears that were in LS that you missed?
- **Answer Markus/Jasmine** – Ultimately, we don't know that's the plus/minus we have on the abundance estimate here. It is unlikely that hundreds were missed because that is like an entire population. However, there is likely some movement between MC and LS, but we don't know how much.
- Jasmine --- we recommend to not get too hung up on the abundance number, but more focus on what the community is comfortable with ---you know what it's like on the land and what this amount feels like---this range that we've presented.

Does that feel like too many? Just right? Want more? This is big question --- we have an estimate that is useable, though it does have uncertainty.

- **Question Beverly** – we are seeing more grizzlies coming up to island. No idea what that is going to mean in the future. And there are hybrids -what do you even classify those animals as? Grizzly or polar bears?
- **Answer Markus** – we aren't sure because the hybrids are not in the Wildlife Act – they didn't think of these back then when it was written. Lol...what we see right now is evolution on how polar bears came about...but it all also depends on how we view the hybrids and their importance.

Discuss TAH – Markus – the reason we recommend an increase from 12-16 is we are cautious, and the recommendation is based on maintaining the population roughly on where it is right now, but also considering uncertainty. We saw what happened in the past, and we all do not want to go back where this population is overharvested, and a moratorium has to be put in place.

- **Question Clarence** – is it possible to have the IQ study included so that this TAH goes up? If Pam's data is super great, could this TAH come up then?
- **Answer Markus** – at this time, this recommendation is just based on the scientific survey and we can't speak to IQ study since Pam hasn't finished. All information, science and IQ, will go to the NWMB – they will consider all information for decision making.
- **Question Beverly** – have you talked to Wily Nakashook?
- **Answer Markus** – I wanted to but haven't been able to get him.
- **Question Beverly** --- are you coming back for consultations after you've finished this tour and heard from all the communities?
- **Answer Markus** – We were not planning on that, but we're willing to have video conference and answer questions
- Jasmine – we will circulate the notes to make sure that we captured the comments and concerns raised today. Will include all the communities' notes.
- Peter – I would really recommend if we accept this, then we should make it even for every community so each community has the same number of tags otherwise there will be conflict.

- Markus – there are options to work together through the KRWB with other communities that harvest from MC and see if the redistribution of tags can be changed. It is also worth thinking about what is the goal with a management objective – are there too many bears? What is tolerable as a number of bears around? There is uncertainty around the number of bears. If the TAH is increased by a few bears there is a risk we all must be willing to accept that the response of the population might be different from what we expect, and we want to avoid a potential reduction and depletion, like what happened in the 1990s.
- Jasmine – we can only base our recommendation on the survey. That doesn't mean that there can't be a joint submission among HTOS and the GN, but for this meeting right now, the recommendation is based on the science. There are a lot of good points relative to the fairness to communities regarding allocation, what the community wants to do relative to the management of this unit. It is ultimately what the community wants.
- Kevin – Grizzly bear TAH submission to KRWB could be done similarly for polar bears.
- Monica – they want the tags too – the other communities so it will be a hard fight. They want them as much as we do.
- Beverly -- Send the link for the harvest tables (*email link sent 10/30/2020*)

Meeting ended with parties being appreciative of the visit and the opportunity to discuss these topics and interesting questions.

B: Gjoa Haven

October 20, 2020

Time Start: 18:50

Time End: 21:15

Participants:

Eruk Pauloosie
 William Aglukkaq
 James Qitsualik via cell phone video chat
 Simon Komangat
 Jimmy Qirqqut
 Roger Ekilik
 Ben Putuguq
 Jimmy Pauloosie
 Ralph Porter Sr.

J. Skillings – GN-DOE
K. Metheun – GN-DOE
M. Dyck – GN-DOE
J. Ware – GN-DOE
Jacob Keanik - translator

- Markus introduced option to go over background of MC/GB or skip it? Question to the board---what would you prefer?
- Ralph: we don't need super detailed on the background so you can go through it quickly.

Background slides: review – our objective to provide new data for the co-management partners and the NWMB to make decisions on setting harvest levels. We are here to hear feedback.

Study methodology: review, no questions

Community participation: review; no questions

Study design: review; no questions

Study design analysis: explained why the amounts of data matter for getting the results; no questions

- Ben: Years ago, when the moratorium came, I was one of the Board members back then and remember it. We used to go all the way to Prince of Wales Island before the quota system was put in place to harvest as much as we could.
- Markus: thank you, I'd like to hear about the ice back then.
- Ben: it's totally different. There isn't any ice really.

MC Study Results: Body condition

- Willy: From experience, males during the spring mating season, the males have empty bellies, just snow in there. They are so focused on females.
- Males are also mating that is likely why male body condition did not improve between studies

MC Study Results: Reproduction, Survival, Abundance; no questions

MC Harvest Recommendation: the increase is our GN recommendation from the scientific study. It doesn't mean that it has to be the TAH. It depends on what the goal for this population is—what do the communities want? Raising harvest higher carries

more risk. This level represents what we think from a scientific study what would maintain this population.

GB Results:

- Willy—the board isn't that interested in Gulf of Boothia because it is very rare that we go there to hunt. The ice conditions are too dangerous. Young hunters do not have any knowledge about that area. We are not that interested in this population.
- Ralph said if a bear doesn't want to show up, you can't see it. It is the knowledge of our ancestors.
- Ben: when our young hunters go to Gulf of Boothia, they don't have a clue about the ice conditions and it's very dangerous...the ice can just take them.
- Willy: that actually happened with a sport hunting group—the ice split and took the hunters out to sea.
- Ben: the hunters that were taken the sport hunters, I was there, and I managed to get home before the ice split. The younger generation doesn't have a clue how the ice conditions.
- Markus: I can go over GB very quickly. It is my job; I have to tell you about it.

GB Results/TAH recommendation: Because it's stable and there are no changes that we can detect, we are recommending that there is no change to the TAH. If the communities feel differently—want more meat or public safety is an issue, then that is an opportunity to discuss how the TAH could change.

- Willy: It doesn't affect us.
- Markus: That's pretty much it for the presentation for the MC/GB. Are there any questions that the community here has with regards to GB/MC/LS boundaries and movements? We can hear these comments and try to see if they can be incorporated into our future work. We are doing LS and are going to be analyzing those samples in the next 4-6 years and we will let you know what we find—were there MC bears up there that we marked in 2014-2016.
- I know there is no desire from this community for collaring, but there are some communities that are interested in movements because they are wondering about climate change, increased development, increased shipping. For example, NTI approached me once about impact on bears from a development project, but I couldn't answer those questions because we don't have movement data. For now, maybe this is okay, but this may be important in the future.

- If there are specific questions from the communities or specific areas of interest, bring those forth to the regional wildlife board/NWMB priority—those priorities help the GN determine how they focus their resources and money along with our mandate to get updated information for the polar bear subpopulations.
- **Question Simon:** Peter DeGroot seems to be doing a lot of research in the last 20 years. What does he do with you guys?
- **Answer Markus:** He works for a university, not affiliated with GN. He is part of a big project, multiple universities, maybe 25 organizations supporting BearWatch – Peter is involved, but he is not the lead. It is looking at genetics, bacteria, developing a kit for fecal sampling. A lot of different projects but Peter is a tiny part of the bigger project. The GN supported Bearwatch because there are bits and pieces of this project that could help for management that we could not collect alone.
- **Question Willy:** Is this work they are doing helping us? It is helping the government...but what is it doing for us?
- **Answer Markus:** the samples are still being analyzed...from the many samples they are trying to determine if it's possible to see contaminants and genetics. As the GN, we could not do it. The idea was to be able to harness the resources of universities and their labs to gather information and develop potential new methods for non-invasive health monitoring of the bears.
- **Answer Jasmine:** also, we don't know if what BearWatch has proposed will work –it was an idea that had to be tested. The idea was to develop less invasive technologies and methods, but will it actually work? Don't know.
- **Question Ralph:** so whatever Peter does it is not affiliated with the NWMB?
- **Answer Markus:** that is correct. Whatever Peter does is not counting bears and they are not primarily responsible to providing info to NWMB for management decisions.
- Willy: they are mostly doing contaminants, health, same as they are doing with the fish.
- Roger: Hunting bears in GB is too far—takes a lot of gas and people don't go there. Mostly MC.

- Markus: the GN is not responsible for allocation—the KRWB does that. For GB, all 3 regional wildlife boards are involved for GB—they all have to talk to each other. That requires a lot of discussion, I think. I think it requires involvement of all the RWOs.
- Ben: Bears in MC once it starts to freeze up, they start to come to town...that's because they are not being harvested due to the moratorium. Even during the summer, there are bear sightings now.
- Markus: Also, probably not that much noise and traffic going out so they aren't afraid.
- Ben: it's because they aren't being harvested or disturbed by machines. They are even sighted far inland on King William Island. The population is healthy.
- Willy: Another thing is that between here and Taloyoak, there used to be a lot of traffic between the two communities even in the spring. Lately they have been seeing bears between here and Taloyoak. Seeing a lot of bears tracks, even wolf and wolverine around Clarence islands. Packs of wolves on the sea ice – Markus you've seen the wolves come into camp, two of them. Even going up to Boothia. But there are packs of wolves and they can also kill polar bears, from experience.
- Markus: the wolves could have an impact on the offspring of polar bears
- Willy: bottom line is that we saw a lot of bear sign and the 3 bears we got were very healthy and over 10 ft.
- Markus: that lines up with what we are seeing –that is really nice to hear.
- **Question Simon:** you were going to talk about sea ice Markus?
- **Answer Markus:** I think the way we looked at sea ice was that we included it our body condition analysis and how that might affect the body condition. We know from satellite imagery from last 30 years that ice has changed. We didn't do full analysis from satellite imagery or ice analysis on ice specifically. I don't know if that's answering your question.
- Simon/Willy nod it was sufficient answer
- Ben: Used to have icebergs that even have cracks and there used to be abundance of seals and there were ice packs and they were easy to spot. Nowadays the bears are moving more because there are less icebergs –we don't see the icebergs anymore.

- Willy: we don't see much ice anymore.
- Markus: agree with the satellite imagery—barely any ice in MC channel in fall
- Willy: people that used to go harvest belugas to Prince of Wales, but as soon as they get westerly winds the ice would get pushed in and they'd be stuck for weeks---they have a hard time getting through because of ice, but now no problem...20 years a big difference in sea ice.
- **Question Markus:** that's the other question I have---if this northern area is free of ice, what's going on with bears? Do they stay on the little ice? Do they go on land? What do you guys see when you travel in the summer?
- Ben: northwest king William island, bears would be swimming miles away from sea ice and can catch seal in open water. They're still hunting even if it's free of ice. They're always traveling even when it's full of ice.
- Willy: During the summer months, July/Aug prince of Wales, I stood and counted 33 bears in Cunningham bay—this happens when the beluga whales are coming in with their calves.
- Markus: to Willy---we tried to figure something out with you and watch bears there - remember?
- Willy: polar bears going after belugas staying in the mouth of the bay to catch them.
- **Question James** (via video on smartphone): Going to that old MOU, remember we had that issue with Taloyoak with them “stealing” our tags when the TAH went to 12. But maybe this is a RWO issue.
- **Answer Markus:** You are correct, this is definitely a point to bring up with the RWO.
- James: I'm trying to make the numbers more equal. I'm just trying to make the communities have a fair trade. If we want a higher TAH is that NTI?
- Jasmine: that would be the NWMB to raise the TAH. The RWO decides how to allocate the TAH.
- **Question Willy:** Why is Taloyoak involved in the TAH for MC when they were not involved when we signed the MOU. Taloyoak can harvest from MC but Gjoa can't get to GB. What are bears considered when they are harvested—MC/GB

- **Answer Markus:** The boundary goes right through Taloyoak
- Willy: so if Taloyoak has a defense kill is that considered MC
- Ben: there was a big male harvested as defense and counted as GB -- happened last year
- Markus: that is something that Kevin/Jack look into
- Kevin: okay
- **Question Jack:** isn't within 30km of the management unit a buffer zone?
- **Answer Markus:** yes, there is a 30 km zone that they can go on both sides.
- Willy: to board---do you have any concerns on bears?—time to ask
- **Question:**---is there going to be another polar bear survey again some time seen?
- **Answer Markus:** that is a very good question---we have seen with our experience that having these long empty data periods of many, many years, it makes analysis very, very challenging. Not just in MC, all the populations this is a struggle having these long gaps. That was the old system because it worked for money resources, bears are long-lived, and it was the management and monitoring plan initially but now we have realized that 15-20-year gaps are not good for analysis. Ideally, we'd like to be back in a few years for a one-year effort to sample bears in MC. That would help us get better data and get better estimates for survival. That is where the HTO comes in—if you make it a priority and identify it to the RWO and NWMB---say it's not okay to have long huge gaps for population assessments---that helps then us and the GN to make our case to allocate time/funding.
- **Question Kevin:** question regarding the 30 km buffer zone – where did that come from?
- **Answer Markus:** that was originally from the MOU—because bears don't respect boundary and hunters may not have always a precise location.
- Willy: like the Hadley Bay population and with NWT
- **Question Jack:** does that get carried forwarded from the MOU into the new polar bear management plan?

- **Answer Markus:** not sure, probably, don't have it memorized, can check. Just want to thank you for allowing us to come in person and giving us your time. Just because we're talking here, doesn't mean that we have to end the conversation...we are open for contact and can help any way we can.
- **Question Simon:** how often could you come to Gjoa Haven?
- **Answer Markus:** 2013 and now 2020 – so maybe twice in 7 years? We rotate through the 12 subpopulations – we have a better chance to make it to the regional AGM and we are certainly open to joining via video conference on an HTO meeting if you have interest or questions for us.
- Jasmine: Unfortunately, you are looking at all the biologists for Nunavut. What we'd like to do personally isn't always what we can do realistically. We would ideally be able to make regular visits and updates for all communities.
- Simon: reason I'm asking is because we've been waiting to hear since 2017
- Markus: I'll tell you the same thing I told Cambridge Bay—it was a long time to wait for these results I admit, it is not ideal --- MC was challenging because the data was so sparse, analysts really struggled to analyze the little bit of data, ransomware, and COVID. I wanted to be able to stand behind these numbers and support them and so it took longer than we predicted. We apologize for that.
- **Question Willy:** another comment/concern I'd like to mention is did you do MC then to GB? --
- **Answer Markus:** we did them at the same time
- **Question Willy:** could you do a survey in the summer?
- **Answer Markus:** No---because there is still ice enough for bears, but not enough for pilots. The pilots don't want to fly over open water and bears would still be in the water and on ice pans during that time—we would not be able to do proper coverage of the area. You'd have to have really low ice and bears would have to be on shore.
- Willy: it is good to hear that we are having a recommended increase and the population is healthy. Of course, we'd like a bit more. A lot of activity and population is increasing.
- End of meeting

C: Taloyoak

October 21, 2020

Start: 17:45

End: 20:15

Participants:

Joe Ashevak, Chairperson HTO

Tommy Aiyout

Bruce Takolik

Jayko Neeveacheak

Kovalak Kootook

J. Ware – GN-DOE

M. Dyck – GN-DOE

K. Methuen – GN-DOE

D. Anavilok – GN-DOE

- Joe: Board wanted to know whether there was going to be a public meeting and were under the impression that there was going to be a public meeting. It appears that Jimmy the manager forgot to bring this up to the GN (Joe asked Jimmy if he let the GN know that the HTO wanted a public meeting and Jimmy indicated that he forgot). *Note, the GN did not receive any notification or request for a public meeting prior to this meeting.*
- This is very important to us and we can wait—sometime this winter would be good. We really want this and have been waiting a long time. M'Clintock is very important. Is this a possibility to do?
- Markus/Jasmine – This is possible to do, but we don't know if it is likely and we cannot commit at this moment because we need to discuss with our supervisors and figure out a schedule.

Background slides: review; no questions

Study design/methods slides: passed around biopsy dart; answered a few questions regarding how the dart sampled the bear. No other questions.

Community participation slides: review; no questions

MC study results:

Body condition results: question to board – do you see the improvements in body condition between now and 20 years ago?

- Joe: well, we don't go to MC too much, but what we see are good. Up in Cunningham Bay, we see lots of bear there and they all seem to be in good shape. Did see a subadult that was frozen, dead, and had no fat on it. During darting, do you take a picture of every bear you see/dart? If not, you should. Take a picture of every bear you see and dart – from the top and side. That way you can easily see what kind of shape they're in.
- David A: two years ago, from Gjoa Haven, there were about 5 or 6 males around one female
- Joe: Cape Sydney---where they congregate when they are mating
- Markus: I found most of the breeding pairs in Larsen Sound and tip of King William Island—hanging out in the rough ice around the islands.

TAH recommendation/discussion:

- the GN recommendation is based on how certain we are with the estimate, it takes into account the uncertainty with the survival and abundance and it takes into account to maintain the population at our current estimate of ~700. This doesn't mean that the community has to decide to maintain the population at 700—there may be different management objectives. We've shared the same information with the other communities. The communities have to decide what the management objective will be for the population.
- One thing to keep in mind, every time that the harvest TAH gets higher, there is increased risk for population to down. Depending on what the management objective is, this may be a good thing or not. The objectives must be discussed among the communities. Also have to consider what effects the sea ice changes and environmental changes might have on the bears and their abundance. Any bear that the TAH is being increased is also increasing the risk for the population to decline in numbers. The communities should discuss really how they want to manage this population for the future for Nunavummiut thinking about harvest, and all the other factors such as ecosystem, sea ice, seals, contamination.
- You can bring your requests to the RWOs or you can contact us to help with these requests/questions. We are here to provide information and even after we are gone from here in person, we are still available to chat/help how we can.
- Joe/others: noted that there have been some observations of mothers with 3 cubs, even during the moratorium

- Markus: we didn't see any in MC or GB with 3 cubs
- **Question David:** did you see other animals during your survey –wolf and wolverine?
- **Answer Markus:** we saw 2 grizzly bears, but no wolves or wolverines during that time we were flying.
- Peter Aqqaq: regarding the lower yearling litter size---maybe you see less yearlings because there is a greater chance of running into an adult male now that there are more males in the population.
- Markus: good point. I've found 1 male coy over the years killed over the years. I thought if I saw more then it would be a big impact.
- **Question Joe:** So with MC, are we increasing the TAH?
- **Answer Markus:** the government is recommending an increase from 12 to 16
- **Question Joe:** we have 12 right now?—between Taloyoak, Gjoa Haven, Cambridge Bay? So only an increase of 4 –that's not very much.
- **Answer Markus:** yes, that is what the government is recommending.
- Kevin: to be consistent with other communities, you can make a submission at any time to the KRWB about allocation. That is the responsible body for allocating tags and the NWMB makes decisions on setting the TAHs.
- **Question Joe:** and if we get 16, how long would that be for—like how many years?
- **Answer Markus:** Speaking as a biologist, not only as the GN, you guys should chat with the other communities and decide on the management objective for the population. Decide what you want to do with this population. Is 700 just right? Want more? Fewer? These questions help decide what kind of harvest level you would want. So, I can't say for how long the TAH would be set.
- **Question Joe:** what was the TAH before the moratorium?
- **Answer Markus:** it was 32 and it was too high---led to the situation where the population went down to 284-300 bears.
- Jasmine: we provide the scientific estimate based on the survey data, but the hunters and communities know what that means practically on the land—what

does this 'number' we provide mean to hunters using the land? That is the question – do hunters/communities feel comfortable at this level of bears, is that something you would like to maintain.

- Markus: the GN will only have real issues if it conflicts with The Agreement in which it is the government's mandate to ensure sustainable harvests into the future.
- David: about the distribution of locations of sampling –found that during hunting there are differences in where seals are---seal distribution changing.
- Joe: global warming may be causing more open water and seals in the newer times—why the distribution of bears is changing. Shipping traffic increased.
- **Question Peter Aqqaq:** the GN has a fisheries and sealings department -- Do you compile the seal data with your polar bear data? Would that be a great idea to compile?
- **Answer Markus:** I've been wondering about that the last 10 years or so to see what they have. I do not know what they have --- they count the hides they buy and sell, but not sure if that would be able to tell how many seals there are just by counting the pelts that are sold.
- Joe: there was a cruise ship that ran aground a few years ago that could have an effect on the seal population. We didn't get a report about that---whether there was fuel or other things that leaked.
- **Question Jayko :** Do you do studies in the summer time?
- **Answer Markus:** It depends on the population....when there are areas with both ice and water it is hard to know if bears on land or on the ice and pilots don't like to fly over open water so those aren't good study designs...for example MC or GB. In other areas, where it goes completely ice free and almost all the bears are on the shore, we can do the summertime.

GB results:

- **Question Joe:** what is the TAH for GB?
- **Answer Markus:** 74
- **Question Jayko:** are you guys getting new equipment –like cameras and stuff to take pictures that have the built-in ability to see how big the bears are?

- **Answer Markus:** I think I know what you're saying, and it might be a bit more complicated to determine actual size from a picture -- we would need to know altitude, distance, focal length. It might be possible to calculate size and do that. We could look into that.
- **Question Tommy:** talking about quota --all those communities Gjoa, Igloodik, Sanirajak, What the quota like before MC was shut down?
- **Answer Markus:** it was 42 until 2003/2004. It was increased to 74 in 2004/2005 because the study in 1998-2000 showed ~1600 bears instead of 900. I was around at that time of the moratorium in MC that communities were given a few tags for GB to preserve traditions during that moratorium and low harvest in MC.
- Joe: that was a big jump from 42 to 74.
- Markus: yes, I don't know how the recommendation went, but it seems that the 74 has been okay because the population has remained stable, though there may be some environmental changes that have helped the population---like the sea ice thinning/reduction in multi-annual ice and becoming better habitat for fish/seals/algae/etc.
- **Question Jimmy:** no colons being collected anymore?
- **Answer Jasmine:** correct, that was a collaborator project and they had funding for only a set number of years. That funding has run out and now they are working on analyzing the data. I am not sure when reports/information will be ready, but reports will be sent to communities with what they find.
- **Question Jimmy:** about credits? If we want to have a sport hunt, can we use our credits for sport hunts?
- **Answer Kevin:** Yes, that is not a problem. However, keep in mind that we haven't approved any outfitter licenses due to COVID. But, we can help support you for that if you have questions. Not much going on with sport licensing this year still with COVID.
- **Question David A.:** with the feces and Peter DeGroot study ---maybe ask the HTO to make sure there was approval -- we're not sure there was approval.
- **Answer Markus:** I'm pretty sure that all Bearwatch research had permits---they would have gone through our department.
- **Question Kevin:** do you know when that permit expires?

- **Answer Markus:** I'm not sure—probably multi-year
- Kevin: during the research permit review period that is a good time to bring up any concerns or comments---that is the time to bring that forward and decide if you support. If you don't say anything, it is assumed to be approval from the HTO.
- **Question Bruce:** Is it mostly the GN that counts bears or do other people do it?
- **Answer Markus:** mostly it is GN, but sometimes we have to have help because it is only me and Jasmine. There are a few people that have lots of experience that we bring on to help out on big projects. I'm in charge of the program and I only get people with experience to do the work. And there are locals involved—it's not just the biologists.
- Following the meeting after Jasmine/Markus left, Kevin remained for other agenda items and it was mentioned again that there was a lot of disappointment that the public would not be hearing these results. Kevin reiterated that it appears this was not communicated to the GN and the biologists were not able to plan for this. Tonight was the first it was brought up about the desire for a public meeting.
- End of meeting