Consultations on the Baffin Bay and Kane Basin Polar Bear Scientific Study Results

January 9-15, 2017

Department of Environment, Government of Nunavut Iqaluit, Nunavut

Executive Summary

Government of Nunavut, Department of Environment (DOE) representatives conducted consultations with Hunters and Trappers Organizations (HTOs) from January 9-15, 2017 as a preliminary round of consultations. The purpose of the preliminary consultations was to provide co-management partners with an overview of the most recent scientific study results on the Baffin Bay (BB) and Kane Basin (KB) polar bear sub-populations, as well as collect feedback on the results presented and collect additional traditional knowledge (TK). Only the HTOs in communities that hunt from the BB and KB sub-populations were consulted.

The feedback and TK collected during preliminary consultations will be considered when forming Total Allowable Harvest (TAH) recommendations for the Baffin Bay and Kane Basin sub-populations. A second round of consultations will be organized to consult with HTOs on the TAH recommendations before the DOE will submit to the Nunavut Wildlife Management Board (NWMB) for decision.

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

Preface

This report represents the Department of Environment's best efforts to accurately capture all of the information that was shared during consultation meetings with the Hunters and Trappers Organizations of Grise Fiord, Pond Inlet, Clyde River and Qikiqtarjuaq.

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 results from the Baffin Bay and Kane Basin Scientific study. Preliminary consultations were conducted with communities to collect feedback and TK prior to forming TAH recommendations for the BB and KB sub-populations. The following communities were consulted from January 9-15, 2015:

- Grise Fiord, January 9, 2017
- Pond Inlet, January 11, 2017
- Clyde River, January 13, 2017
- Qikiqtarjuaq, January 15, 2017

After the preliminary consultations, the TAH recommendations will be formed and additional consultations will be carried out in the same communities to discuss the recommendations before the DOE makes a submission to the NWMB for decision.

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

2.0 Purpose of Consultations

The purpose of these preliminary consultations was to discuss the newest information regarding the Baffin Bay and Kane Basin polar bear sub-populations as reported in the scientific study report produced by the Scientific Working Group (SWG). The SWG was created by the Joint Commission (JC) on polar bears to collect new scientific data and update the status of the shared sub-populations between Canada/Nunavut and Greenland. After the preliminary consultations and the completion of a Harvest Risk Assessment study by the SWG, the JC will make TAH recommendations for both sub-populations. A second set of community consultations will be carried out to discuss those TAH recommendations. Following those consultations the DOE will submit TAH recommendations to the NWMB for decision.

2.1 Format of Meetings

The meetings were held in the evening or afternoon and ran between 3 to 4 hours depending on HTO engagement. Meetings were facilitated and led by Polar Bear Biologist, Stephen Atkinson, who was also a presenter. Each consultation started with a Social Science Program Update presentation from Moshi Kotierk (Appendix 1). The presentation was an overview of a series of interviews conducted in the communities of Pond Inlet, Clyde River and Qikiqtarjuaq regarding public opinion on polar bear population trends. Following the Social Science presentation there was time for questions. Stephen Atkinson then presented an overview of the results from the study conducted on the Kane Basin or Baffin Bay polar bear subpopulations (Appendix 2, Kane Basin; Appendix 3, Baffin Bay). The participants were invited to ask questions, raise concerns, or provide recommendations throughout the meetings. After the presentation, questions/discussion continued until no further questions were raised. At the end

of the meetings it was explained to the HTO members that the TAH recommendations would be developed following the release of results from the Risk Assessment study being conducted by the SWG and further consultations would occur to discuss the community recommendations for TAH.

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. A full report of the questions and comments from each community can be found in Appendix 4. As Grise Fiord was the only community that hunted from the Kane Basin sub-population they did not share some of the concerns raised in the other three communities.

3.1 Grise Fiord Consultation Summary

Date: January 9, 2017

Representatives:

- GN-DOE, Polar Bear Biologist: Stephen Atkinson
- GN-DOE, Social Science Researcher: Moshi Kotierk
- GN-DOE, Senior Wildlife Advisor: Caryn Smith
- GN-DOE, Senior Wildlife Manager: Jason Aliqatuqtuq
- NTI: Cheryl Wray
- NWMB, Wildlife Management Biologist: Erin Keenan
- QWB, Chairperson: James Qillaq
- Iviq HTO Board members

Comments and questions:

The HTO members in Grise Fiord raised several questions regarding the results of using collars on bears. They asked for confirmation that there were no fatalities as a result of collars and how many of the collars were successfully retrieved at the end of the study. The HTO members confirmed that their experiences were in agreement with the study results presented to them. The HTO members expressed that they had observed an increase in polar bear numbers in Kane Basin. HTO members felt that the community's good conservation practices may have contributed to the population increase along with the reduced Greenland harvest and sea ice changes, as indicated by the study results.

3.2 Pond Inlet Consultation Summary

Meeting Dates: January 11, 2017

Representatives:

- GN-DOE, Polar Bear Biologist: Stephen Atkinson
- GN-DOE, Social Science Researcher: Moshi Kotierk
- GN-DOE, Senior Wildlife Advisor: Caryn Smith
- GN-DOE, Senior Wildlife Manager: Jason Aliqatuqtuq
- NTI: Cheryl Wray
- NWMB, Wildlife Management Biologist: Erin Keenan
- QWB, Chairperson: James Qillaq
- Mittimatalik HTO Board members

Comments and questions:

In response to questions asked by Stephen Atkinson regarding why bears appeared to be denning higher in the mountains, the HTO members indicated that there would be more snow in higher terrain and the bears needed more snow to make their dens. HTO members expressed concern over reports of some bears being thinner as they do not think it would necessarily indicate an overall problem. They believe that not all bears are good hunters so there would naturally be some thinner bears in the population. Some HTO members relayed knowledge that some bears live their whole lives in the water and are highly efficient at hunting in the water. Some of these bears may be too heavy and too big to live on the land. Some members of the community believe that the decrease in sea ice will allow bears to hunt more successfully.

There were concerns brought up regarding nuisance bears and further concern that deterrent practices are causing further problems for the bears. With increased nuisance bears, there are also concerns for security of their food caches.

Stephen Atkinson asked the HTO members if they thought that there were more bears in the fiords since the previous study was conducted in the 1990's, or was the capture differences between the 1990's study and the most recent study due to increased search area. There was no real consensus from the HTO members in response. Stephen also asked if there would be support for using satellite collars in future survey work. The HTO members agreed that they would be willing to consider it in the future.

There were concerns raised regarding increased marine and ice breaker traffic in Baffin Bay and whether or not this was having an impact on polar bear habitat. HTO members expressed concerns that this increase in marine traffic was having negative impacts on the conditions of the sea ice and the timing of ice break up and ice formation.

Questions were raised concerning the current trade ban on the export of Baffin Bay polar bear hides due to the negative non-detriment finding for Baffin Bay and whether or not it will be lifted following this new survey work. Stephen explained it was a Federal decision in conjunction with CITIES and outside of GN control.

3.3 Clyde River Consultation Summary

Date: January 13, 2017

Representatives:

- GN-DOE, Polar Bear Biologist: Stephen Atkinson
- GN-DOE, Social Science Researcher: Moshi Kotierk
- GN-DOE, Senior Wildlife Advisor: Caryn Smith
- GN-DOE, Senior Wildlife Manager: Jason Aliqatuqtuq
- NTI: Cheryl Wray
- NWMB, Wildlife Management Biologist: Erin Keenan
- QWB, Chairperson: James Qillaq
- Nangmautaq HTO Board members

Comments and questions:

In response to questions asked by Stephen Atkinson regarding why bears appeared to be denning higher in the mountains, the HTO members indicated, as Pond Inlet did, that the higher terrain is where the snow is better for denning. The HTO members expressed concerns over the potential underestimated population results from the surveys completed in the 1990's. They believe that there were just as many bears in the fiords in the 1990's and that the discrepancies between the previous survey and most recent survey is due to increased search areas used in the most recent survey.

There was discussion regarding the improvements made in satellite collar technology, particularly concerning the improved quality of the collars and the data they provide. When asked how the HTO members would feel about the potential use of collars in future survey work they agreed that they would take it into consideration.

The HTO members in Clyde River also had concerns over the increases in marine traffic and ice breaker use in Baffin Bay and the impact on sea ice conditions, ice break up and ice formation. There were also concerns raised by HTO members that the increased polar bear population was negatively impacting the seal populations in Baffin Bay.

3.4 Qikiqtarjuac Consultation Summary

Date: January 15, 2017

Representatives:

- GN-DOE, Polar Bear Biologist: Stephen Atkinson
- GN-DOE, Social Science Researcher: Moshi Kotierk
- GN-DOE, Senior Wildlife Advisor: Caryn Smith
- GN-DOE, Senior Wildlife Manager: Jason Aliqatuqtuq
- NTI: Cheryl Wray
- NWMB, Wildlife Management Biologist: Erin Keenan

- QWB, Chairperson: James Qillaq
- Nattivak HTO Board members

Comments and questions:

HTO members in Qikiqtarjuac shared concerns over polar bears being killed by other bears and whether or not they should report those if they come across those kills. There were also concerns that the harvest would eventually be stopped all together. Stephen Atkinson responded to these concerns by indicating they should report any kills they encounter to the Conservation Officer and that it is not likely the harvest will be stopped any time in the near future as the population is currently healthy overall.

The HTO members commented on current ice conditions and concerns over the implications of far less ice forming on the Greenland side of Baffin Bay. They also wanted to know when the next survey work would be done for that population. Stephen asked the HTO members if they would consider allowing satellite collars to be used in future survey work but there was no consensus from the members. The question did lead to discussion around the improved quality of satellite collar technology.

Stephen Atkinson asked the HTO members if they felt there were more bears in the fiords since the previous survey work in the 1990's or whether the increased captures in the most recent survey was due to increased search areas. Some of the members responded by saying they believe the number of bears using the fiords is increasing since the 1990's and before.

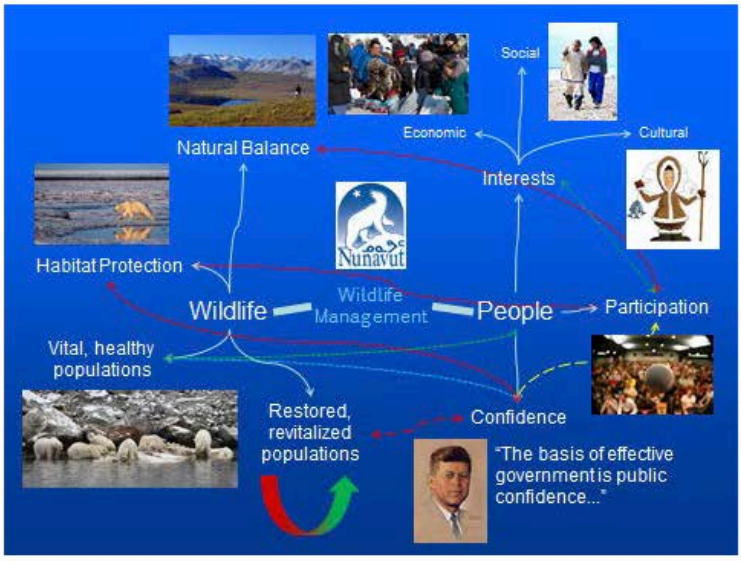
4.0 Summary

Some of the common concerns expressed by HTO members during the consultations focused on the increasing amount of marine traffic and icebreakers traveling through Baffin Bay and the resulting impact on polar bear habitat. There was substantial discussion in each community regarding the advancements of satellite collar data and the potential for the use of collars to be revisited when preparing future survey work. Each community seemed to be in agreement with the population estimates presented during the consultations and HTO members were receptive to an additional round of consultations before TAH recommendations are sent to the NWMB for consideration.

Appendix 1: Social Science Program Update from Moshi Kotierk

Nunavut Wildlife Management

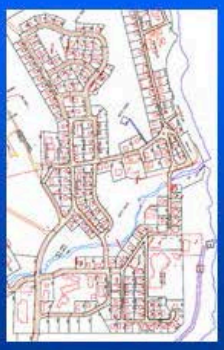
- NLCA creates a wildlife management system that is
  - Governed by and implement conservation principles
  - Fully acknowledges and reflects the primary role of Inuit in wildlife harvesting
  - Serves and promotes the long-term economic, social and cultural interests of Inuit harvesters
  - As far as practical, integrates the management of all species of wildlife
  - Invites public participation and promotes public confidence, particularly amongst Inuit, and
  - Enables and empowers the NWMB to make wildlife management decisions pertaining thereto.



Methods

- Community Surveys
- Elder/Hunter Interviews

Baffin Bay Polar Bear



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ᑲᑎᖅᓯᒪᔨ	82

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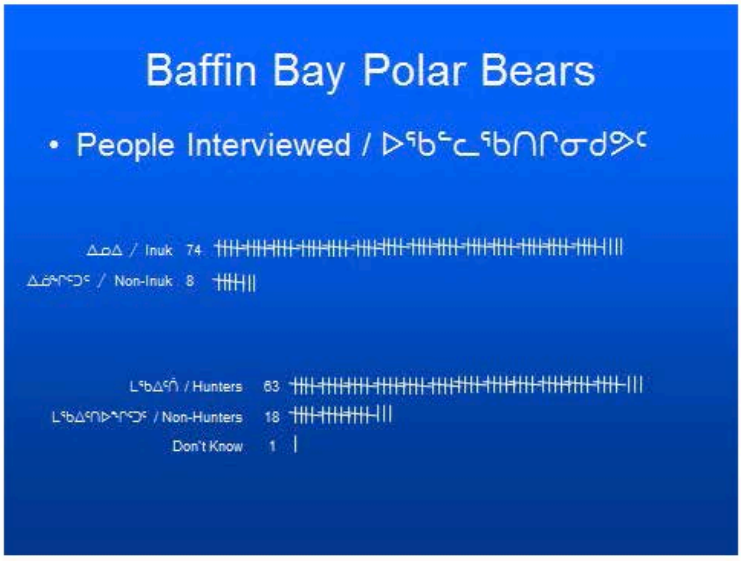
Overview / ᐅᖅᑐᐅᓯᓚᓂᐊᖅᑕᒃᑐ
• Background / ᓯᕗᓕᒥᖅ
– Wildlife Management in Nunavut
– Research Methods
• Baffin Bay Polar bear

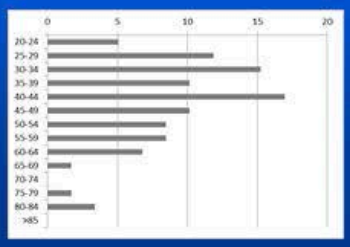

Baffin Bay Polar Bears
• People Interviewed / ᐅᖅᑉᓪᓕᖅᑎᑎᓂᑯᓕᕐᓂ
ᐃᓄᐃ / Inuk 74
ᐃᓄᙳᕐᓗᒃ / Non-Inuk 8
Lᖅᐃᖅᑎ / Hunters 63
Lᖅᐃᖅᑎᐅᕐᓂᒃ / Non-Hunters 18
Don't Know 1

Baffin Bay Polar Bear

- People Interviewed / ᐅᖃᖅᑕᖅᑎᑐᓂᐊᕐᓴᖅ

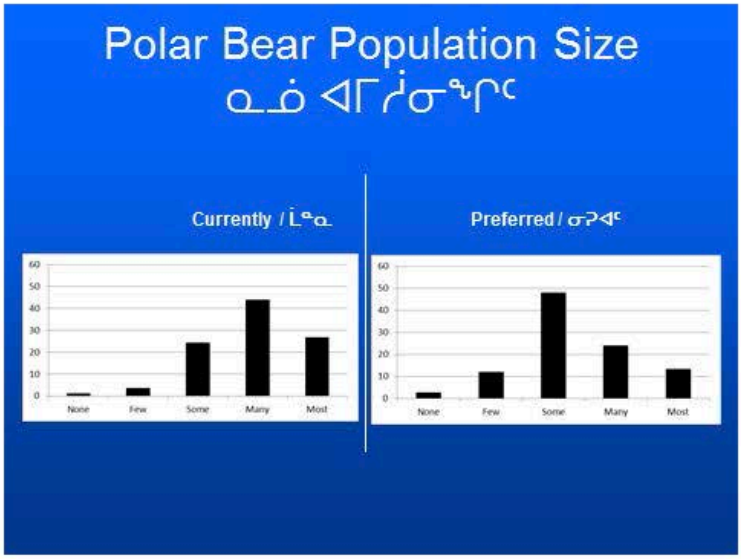
ᐊᖏᔪᑎᑦ / Male 55

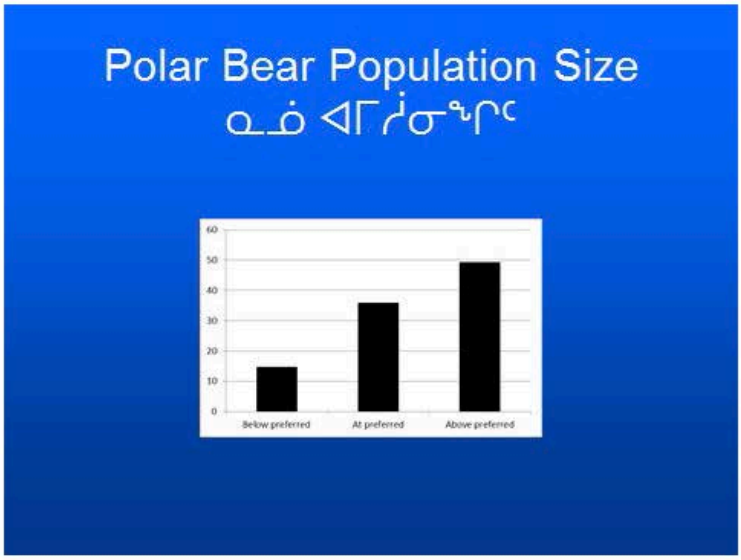
ᐊᖏᓇᐃᑦ / Female 26

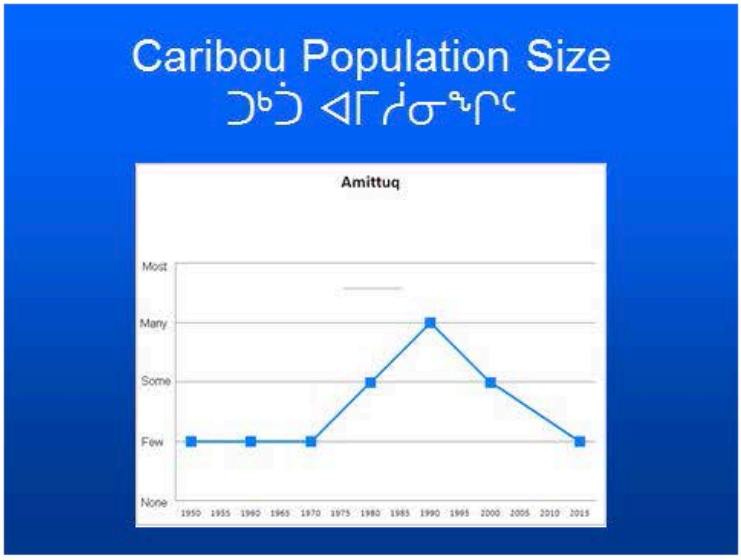


Elder/Hunter Interviews

Interviewee
Anonymous
Anonymous
Anonymous
Jayko Ashevak
Markosie Audlakiak
Daniellie Komangapik
Zebedee Kullualik
Levi Nutaralaq
Elijah Panipakoocho
Isa Piungittuq
Paniloo Sangoya
Abraham Tigullaraq


Polar Bear Population Size
ᓇᓄᑦ ᐊᒥᓱᓕᖅᑐᑦ
Currently / ᒪᓐᓇ
Preferred / ᓂᕆᐊᑦ
60
50
40
30
20
10
0
None
Few
Some
Many
Most


Polar Bear Population Size
ᓇᓄᑦ ᐊᒥᓱᓕᖅᑐᑦ
60
50
40
30
20
10
0
Below preferred
At preferred
Above preferred


Caribou Population Size
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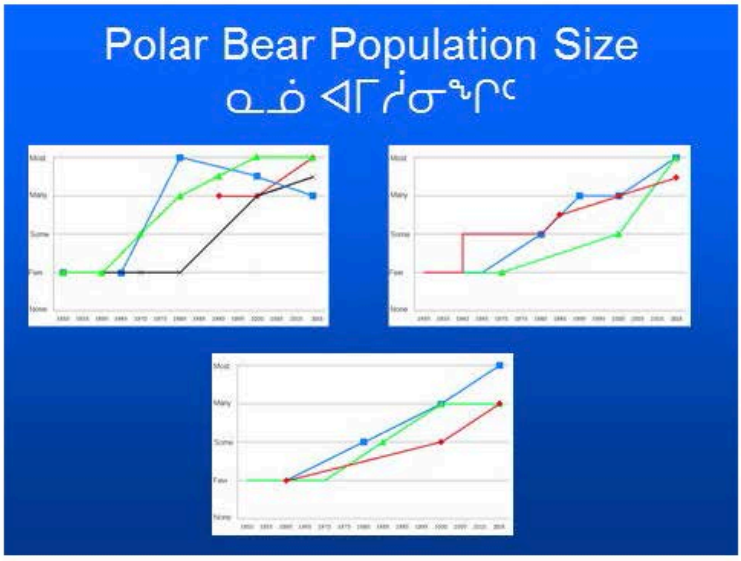
Amittuq
Most
Many
Some
Few
None
1950 1955 1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010 2015


Polar Bear Population Size
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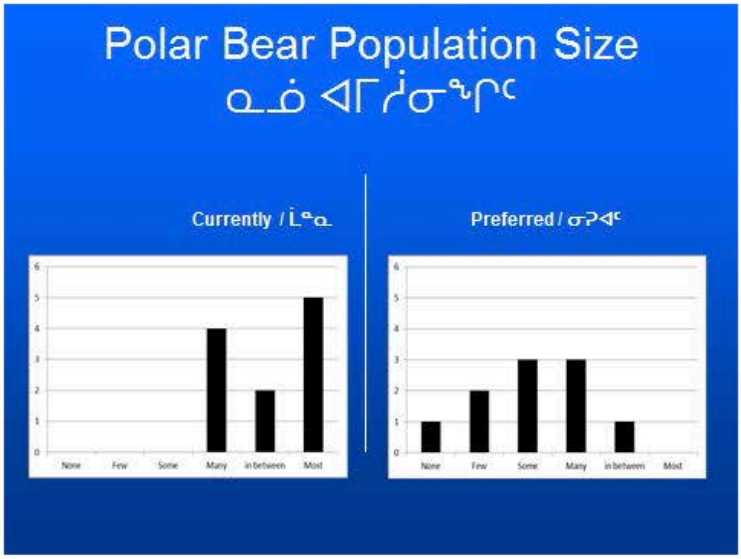
Polar Bear Population Size
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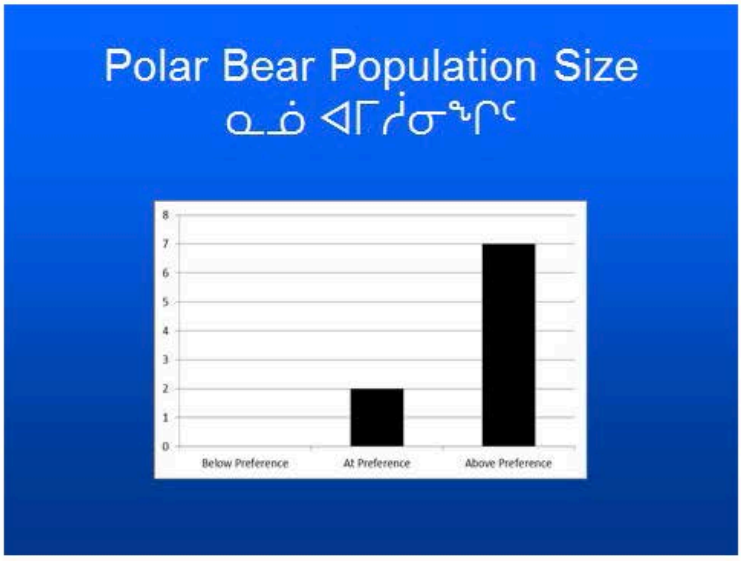
Currently / ᒪᐃᓇ
Preferred / ᓂᕆᐊᓪ
None
Few
Some
Many
in between
Most


Polar Bear Population Size
ᓇᓗᓂ ᐊᒥᓱᓕᕆᓂᖅ
Below Preference
At Preference
Above Preference

Precaution / ᐅᓴᖅᓯᕐᓂᖅ

Precaution / ᐅᓴᖅᓯᕐᓂᖅ

ᐃᒪᐃᑦᑕᕐᖓᑐᒃ ᐊᑐᖅᑕᐅᓂᐊᖅᑐᑦ:

- The need for a decision,
- A risk of serious or irreversible harm,
- A lack of full scientific certainty.

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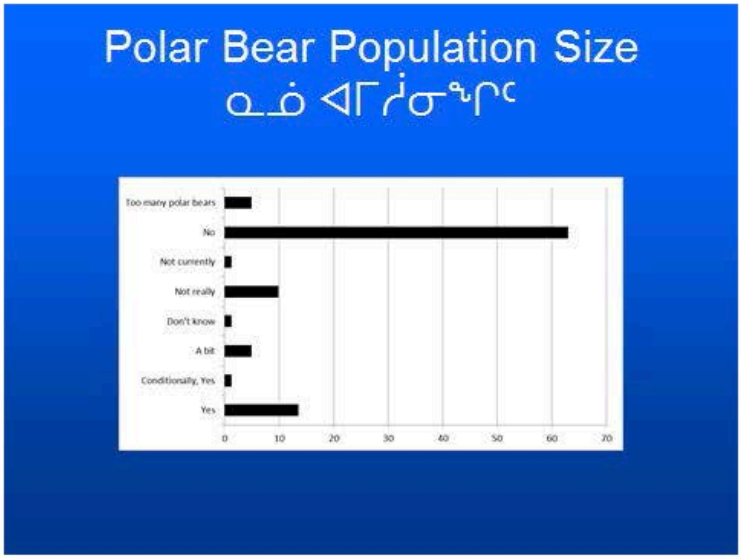
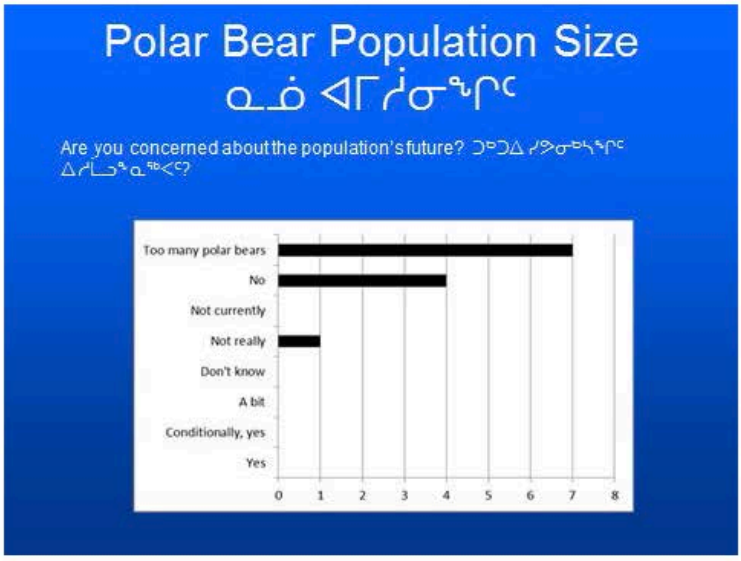
1. It is legitimate that decisions be guided by society's chosen level of protection against risk
2. A high degree of transparency, clear accountability and meaningful public involvement are appropriate


Polar Bear Population Size
ᓇᓗᓄ ᐊᒥᓱᓂᖏᑦ
Too many polar bears
No
Not currently
Not really
Don't know
A bit
Conditionally, Yes
Yes
0
10
20
30
40
50
60
70


Polar Bear Population Size
ᓇᓗᓄ ᐊᒥᓱᓂᖏᑦ
Are you concerned about the population's future? ᑐᵖᑐᐃ ᓱᕐᓂᖅᓴᖏᑦ ᐃᓱᒪᓕᕐᓇᖅᑲᑦ?
Too many polar bears
No
Not currently
Not really
Don't know
A bit
Conditionally, yes
Yes
0
1
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7
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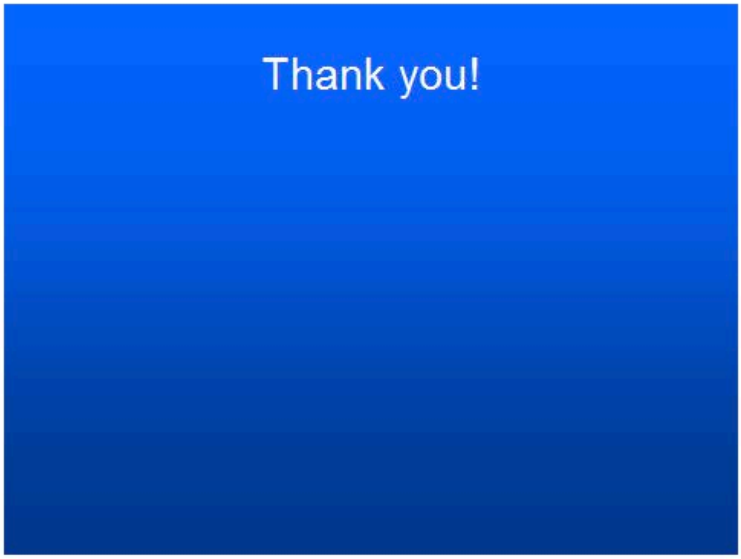
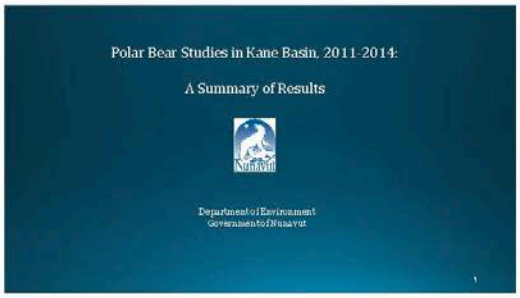
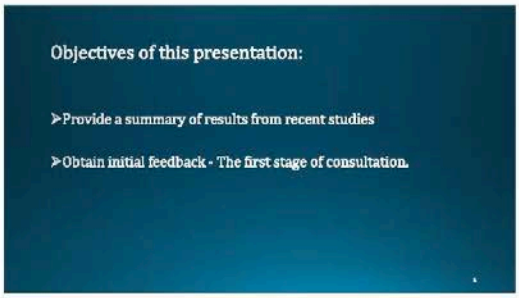


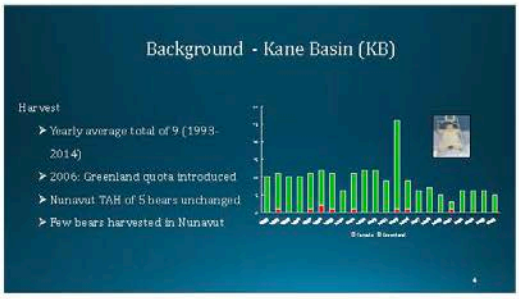
Principles of Conservation

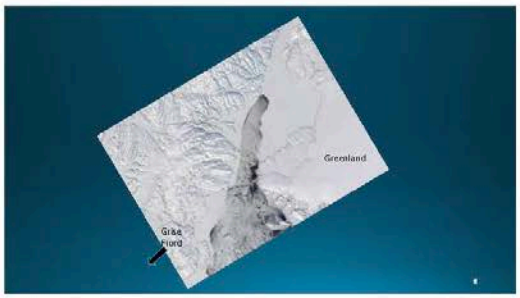
- The principles of conservation will be interpreted and applied giving full regard to the principles and objectives and the rights and obligations set out in this Article.
- The principles of conservation are:
  - The maintenance of the natural balance of ecological systems within Nunavut;
  - The protection of wildlife habitat;
  - The maintenance of vital, healthy, wildlife populations capable of sustaining harvesting needs.
  - The restoration and revitalization of depleted populations of wildlife and wildlife habitat.

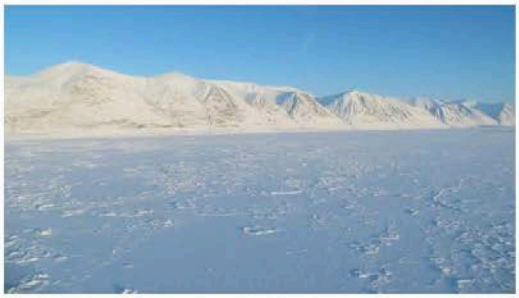
Appendix 2: Kane Basin Polar Bear Survey Results Presentation

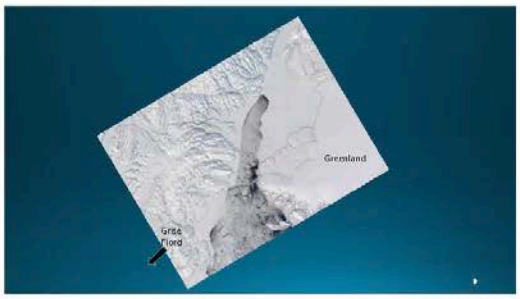


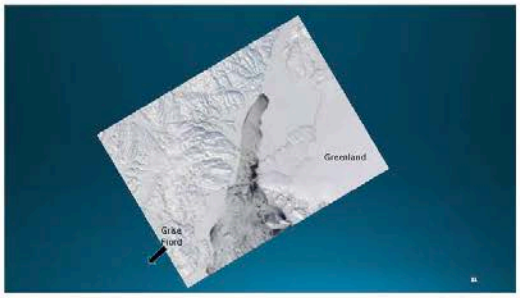









Greenland
Grise
Fiord


Greenland
Grise
Fiord

Canada-Greenland Joint Commission (JC)

- Established in 2009
- Coordinated management of BB and KB
- NTI, QWB, GN and GC appointees
- Working Groups – Scientific, IQ
- 2010: Reviewed available science and IQ
  - Scientific information outdated
  - Collection of IQ has been limited

Recommendation:

Conduct new studies to provide updated scientific information and IQ. Use this new information to manage the subpopulations and help resolve differences between the current scientific and IQ-based assessments

New Studies: 2011-2014

Objectives

- Reassess the validity of the BB and KB areas as harvest management units
- Evaluate polar bear distribution with respect to environmental variables; particularly ice conditions, topography and the distribution and availability of food
- Estimate the abundance and composition (sex/age) of polar bears in BB and KB
- Compare new estimates of abundance with those derived from previous studies (1991-1997), to gain insight into subpopulation trends
- Estimate survival and reproduction (to the extent possible)

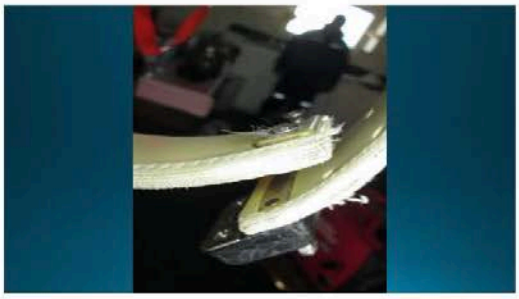
Study Components:

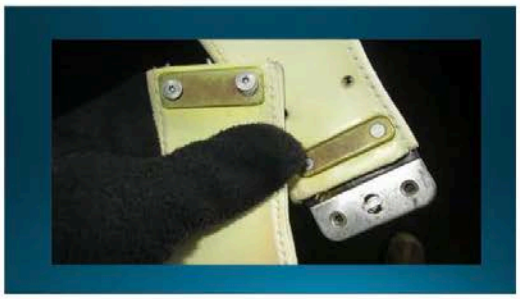
- Delineation and Movements#
- Habitat and habitat use#
- Population size and trend*
- Body condition and reproduction*

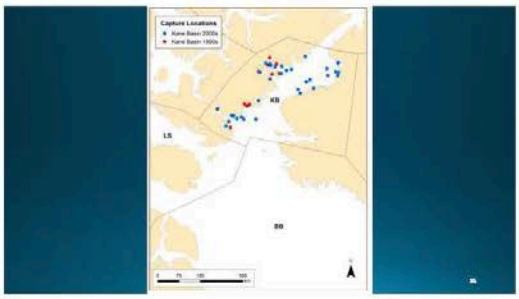
(*GN-led, #Greenland-led)

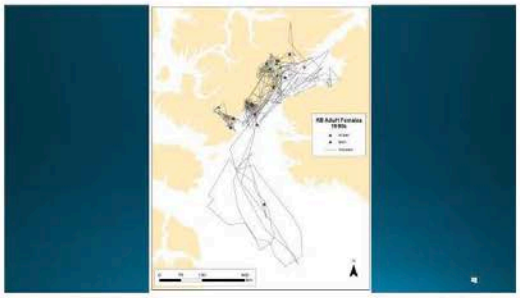
Study Design - Population Delineation and Movements

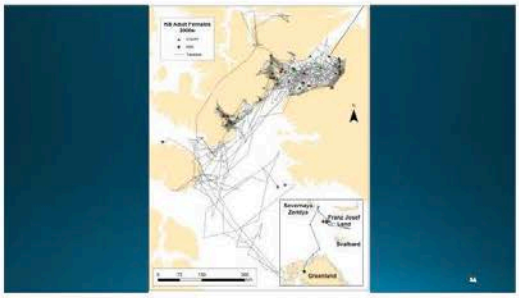
- Collars and ear-tag transmitters: Data from 1990-1997 and 2009-2015
- Recaptures and harvest recoveries of marked bears (1990 to 2015)
- Genetics






Capture Locations
KB
LS
BB




Franz Josef Land
Svalbard
Greenland

Key Results – Delineation and Movements

Since the 1990s:

- Genetic basis for delineation remains unchanged
- Subpopulation's range has expanded (especially in summer)
- Range use in summer and spring has shifted north
- Range expansion may reflect the trend towards an annual ice regimen (i.e. decreasing multiyear ice)
- KB still a relevant unit for harvest management

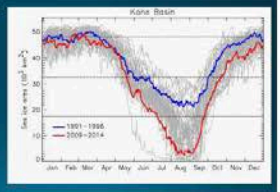
(95% kernels)

Study Design – Habitat & Habitat Use

- Sea-ice satellite images for 1979 to 2015
- Collars and ear-tag transmitters: Data from 1990-1997 and 2009-2015

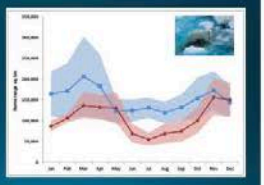
Key Results – Habitat

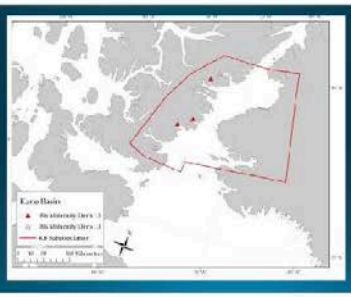
- Changing from year-round ice to a seasonal ice area.
- Reduced summer time sea-ice coverage
  - >30% in 1990s
  - <5% in 2000s
- Spring sea-ice retreat 7 days earlier per decade
- Fall sea-ice advance 5-6 days later per decade
- Mean ice concentration (June-October) decreasing 5-6% per decade



Key Results – Habitat Use

- Habitat use patterns similar to bears in seasonal ice ecoregion
- Expanded seasonal home ranges
- Use of land during summer remains occasional because some ice still persists in fiords and coastal areas

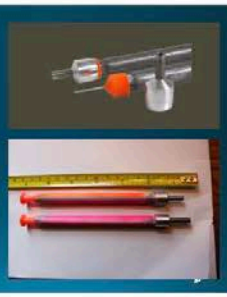




Study Design – Population Size and Trend

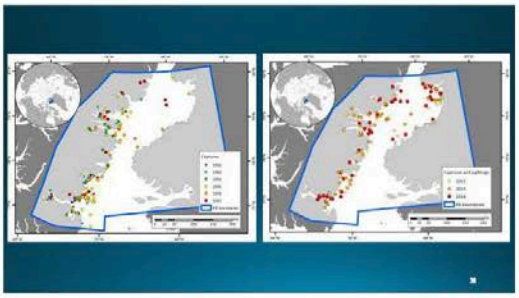
Genetic mark-recapture

- DNA samples via biopsy
- Quick - No drugging and handling
- Accurate for individual ID and gender
- No specific age data or samples for other studies



Study Design – Population Size and Trend

- April-May
- Sea-ice and surrounding coastline
- Canada and Greenland

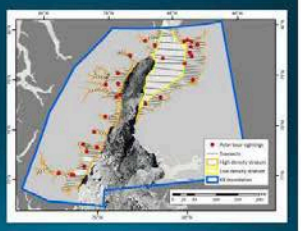


Key Results – Population size and Trend

- >170 bears sampled genetically
- Approximately >50% were not handled
- Estimate of 357 bears
- Stable or increasing
- Increased densities of bears in eastern KB possibly due to reduce hunting pressure in Greenland

Key Results – Aerial Survey

- Test survey to assess future feasibility
- Estimate of 206 bears
- Potential negative bias due to limited coverage over polygons
- Future use as rapid assessment tool



Study Design – Body Condition and Reproduction

- Body condition scores
- Litter sizes and ages

Key Results – Body condition and Reproduction

- Very limited data
- No evidence of changes in reproduction since 1990s
- Reproductive performance similar to other subpopulations
- Some evidence of improved body condition (linked to changing ice?)

Next Steps

- Development of harvest management options
- Harvest recommendations

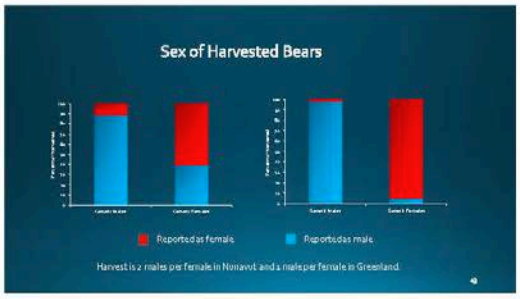
Thank you

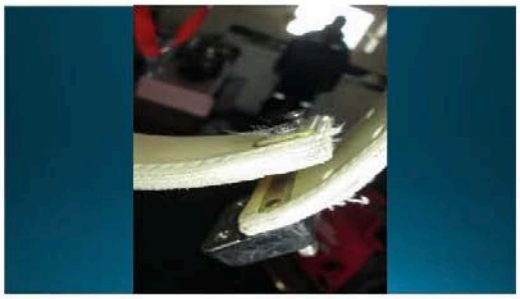
Participants in the Studies

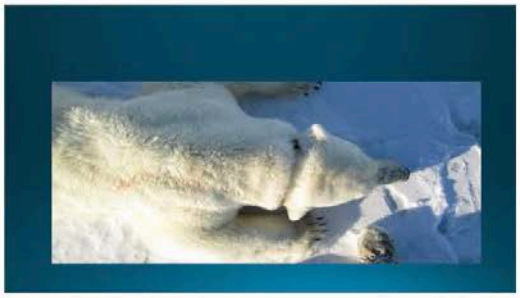
Ivujivik HTO	Mittimatalik HTO	Hamlet aq HTO	Hall vak HTO
Jupee Kigutak	Adrian Jimmy Pitseolak	Robert Kautak	Robbie Kulloalik
Mark Akeeagok	Brian Koonoo	Jaypeetee Kalliktee	Jollie Koksiak
		Jacob Jaypoody	Jaloo Koonelo osie

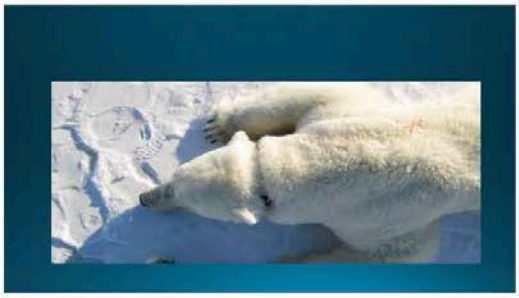


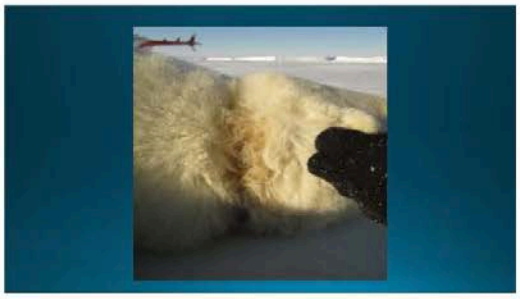
...and many others

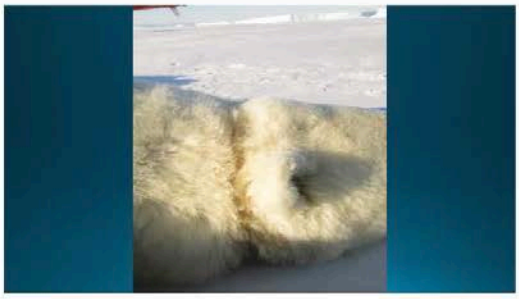

Sex of Harvested Bears
Reported as female
Reported as male
Harvest is 2 males per female in Nunavut and 1 male per female in Greenland.

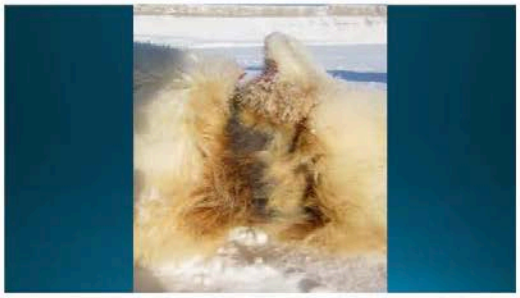






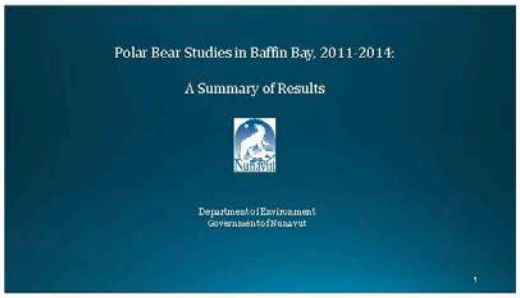


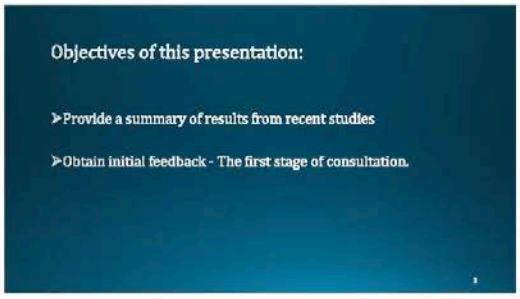


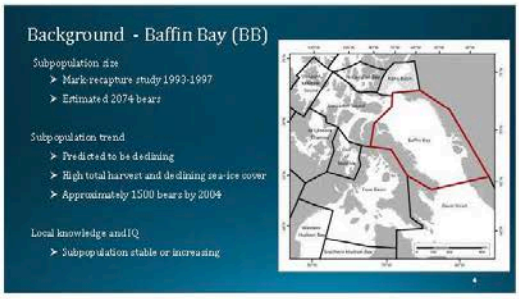


Appendix 3: Baffin Bay Polar Bear Survey Results Presentation

2017-06-01







1

New Studies: 2011-2014

Objectives

- Reassess the validity of the BB and KB areas as harvest management units
- Evaluate polar bear distribution with respect to environmental variables; particularly ice conditions, topography and the distribution and availability of food
- Estimate the abundance and composition (sex/age) of polar bears in BB and KB
- Compare new estimates of abundance with those derived from previous studies (1991-1997), to gain insight into subpopulation trends
- Estimate survival and reproduction (to the extent possible)

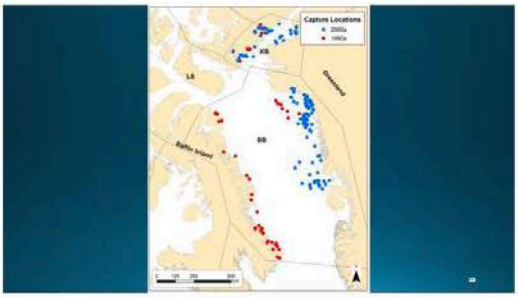
Study Components

- Delineation and Movements*#
- Habitat and habitat use*#
- Population size and trend*
- Body condition and reproduction*

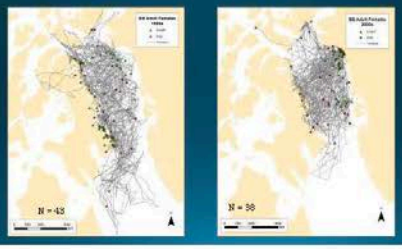
(* GN-led; # Greenland-led)

Study Design - Population Delineation and Movements

- Collars and ear-tag transmitters: Data from 1990-1997 and 2009-2015
- Recaptures and harvest recoveries of marked bears (1990 to 2015)
- Genetics



Key Results – Delineation and Movements



(95% kernel)

Since the 1990s:

- Genetic basis for delineation remains unchanged
- Subpopulation's range has contracted (e.g. 60% decrease in summer range size)
- Range has shifted north in all seasons

Since the 1990s:

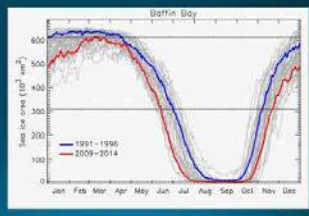
- Less movement of bears from BB into neighboring subpopulations
- The result of changing sea-ice conditions (e.g. reduced annual sea-ice coverage and earlier spring break-up)
- BB still a relevant unit for harvest management

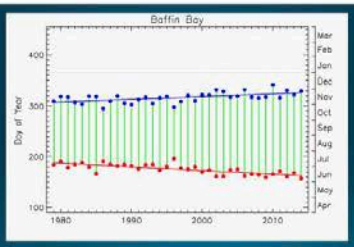
Study Design – Habitat & Habitat Use

- Sea-ice satellite images for 1979 to 2015
- Collars and ear-tag transmitters: Data from 1990-1997 and 2009-2015

Key Results – Habitat

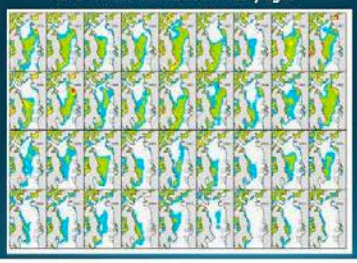
- Sea-ice concentration (June-Oct) decreasing by 4% per decade
- Break-up earlier and freeze-up later.
- Melt occurring 3-4 weeks earlier now than in 1990s
- Significant loss of polar bear habitat has occurred

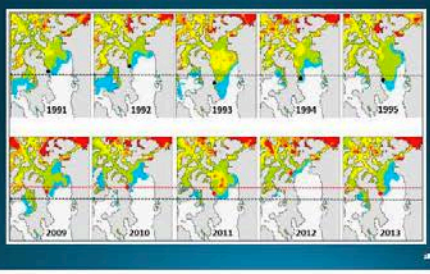


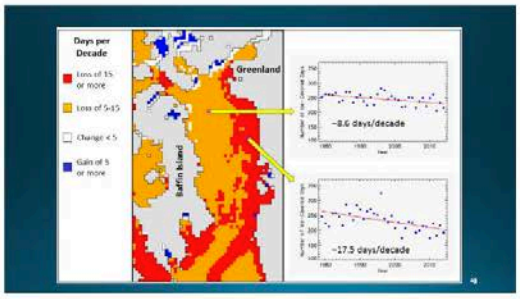


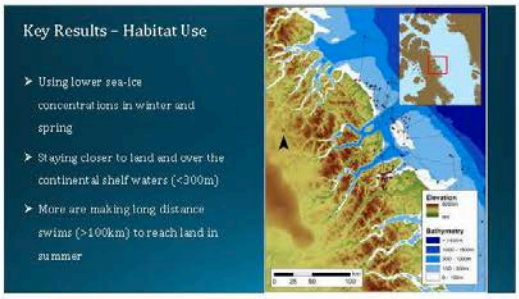
Day of spring sea-ice retreat (red circles), fall sea-ice advance (blue circles), and the interval between them (green lines), for Baffin Bay (all depths), 1979-2014.

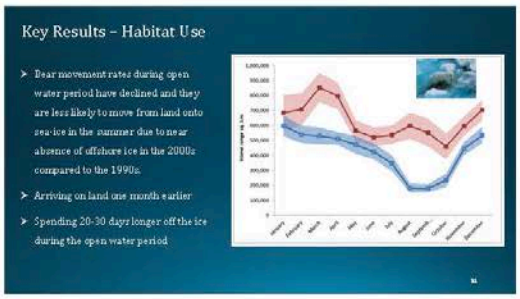
Sea-ice concentration on July 15th

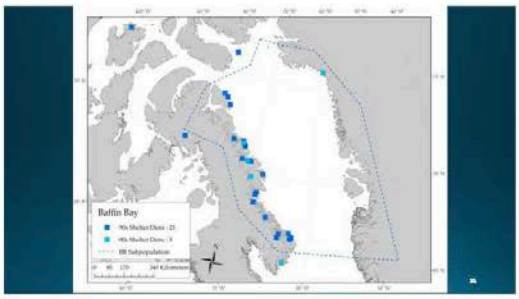


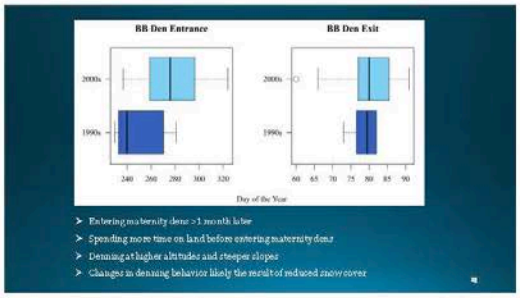


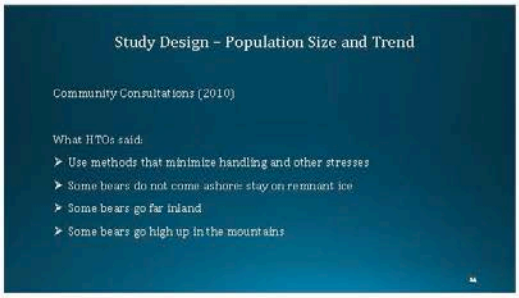

Days per Decade
Loss of 15 or more
Loss of 5-15
Change < 5
Gain of 5 or more
Greenland
Baffin Island
-8.6 days/decade
-17.5 days/decade

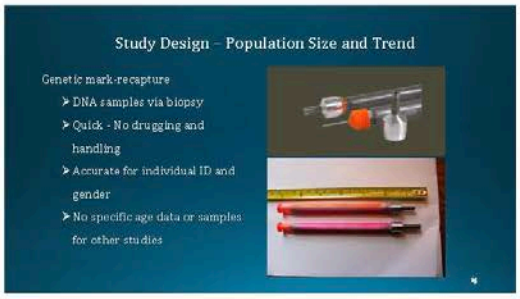

Key Results – Habitat Use
Using lower sea-ice concentrations in winter and spring
Staying closer to land and over the continental shelf waters (<300m)
More are making long distance swims (>100km) to reach land in summer
Elevation
Bathymetry

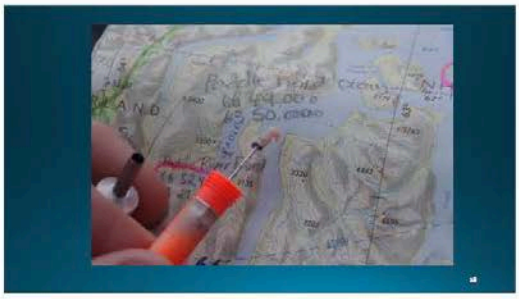

Key Results – Habitat Use
Bear movement rates during open water period have declined and they are less likely to move from land onto sea-ice in the summer due to near absence of offshore ice in the 2000s compared to the 1990s.
Arriving on land one month earlier
Spending 20-30 days longer off the ice during the open water period

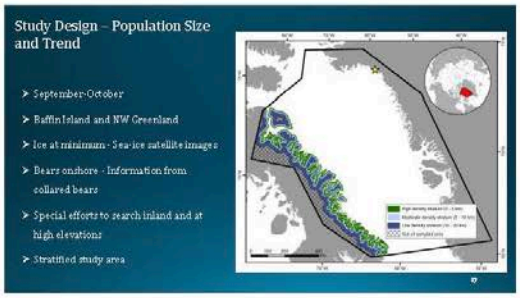

Baffin Bay

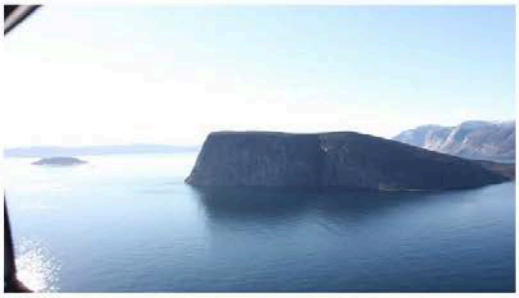

BB Den Entrance
BB Den Exit
2000s
1990s
240 260 280 300 320
60 65 70 75 80 85 90
Day of the Year
Entering maternity dens >1 month later
Spending more time on land before entering maternity dens
Denning at higher altitudes and steeper slopes
Changes in denning behavior likely the result of reduced snow cover


Study Design – Population Size and Trend
Community Consultations (2010)
What HTOs said:
Use methods that minimize handling and other stresses
Some bears do not come ashore; stay on remnant ice
Some bears go far inland
Some bears go high up in the mountains


Study Design – Population Size and Trend
Genetic mark-recapture
➢ DNA samples via biopsy
➢ Quick - No drugging and handling
➢ Accurate for individual ID and gender
➢ No specific age data or samples for other studies




Study Design – Population Size and Trend
➢ September-October
➢ Baffin Island and NW Greenland
➢ Ice at minimum - Sea-ice satellite images
➢ Bears onshore - Information from collared bears
➢ Special efforts to search inland and at high elevations
➢ Stratified study area



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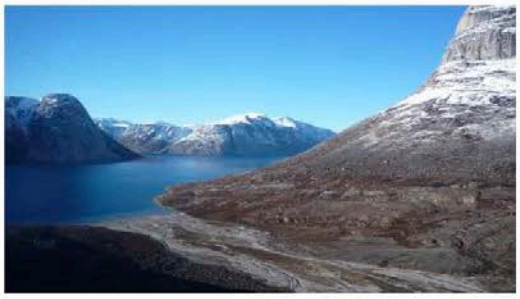
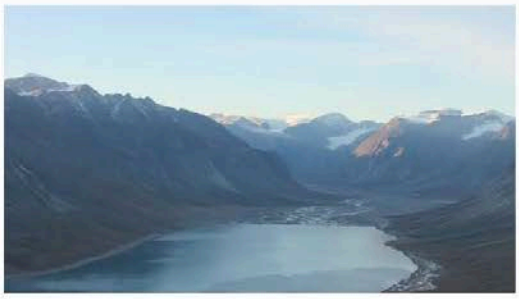
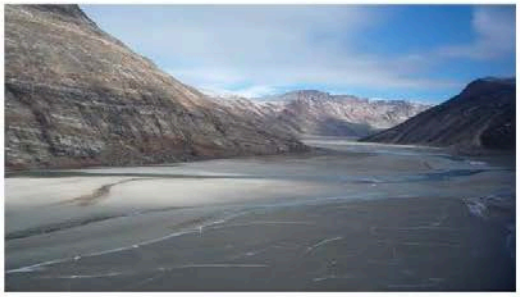
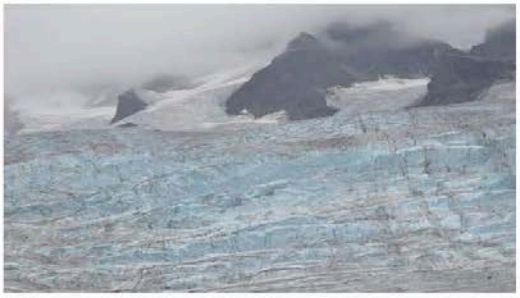
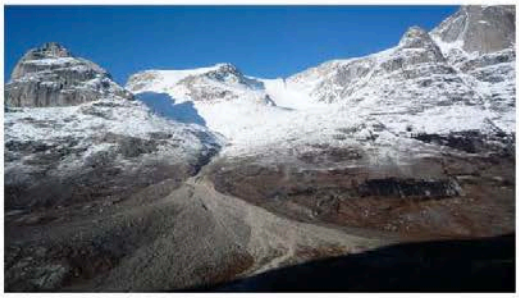


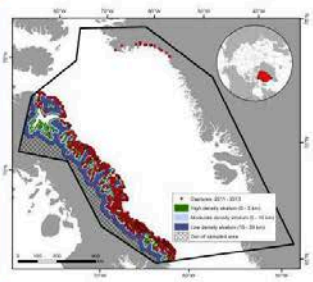






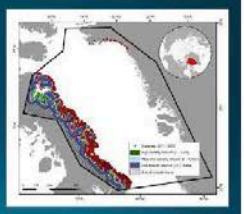


- More than 1400 bears genetically sampled (2011-13)
- More than 95% of bears were not handled



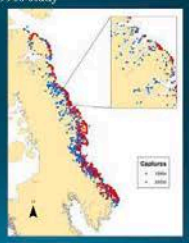
Key Results – Population size and Trend

- Estimate of 2826 bears (2012/13)
- Abundant population
- Trend uncertain due to:
  - Differences between past and present studies
  - Limited ability to estimate survival rates



Problems with the 1990s study

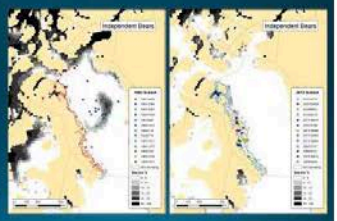
Sampling area less than half that of the 2000s area



Less sampling inland and in fiords

Problems with the 1990s study

- Bears were still on the sea-ice when sampling was occurring
- <30% of collared bears were within the sampling area during sampling
- Potential for bias due to incomplete geographic coverage and greater temporary emigration
- In particular under sampling of adult females

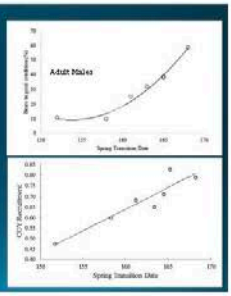


Study Design – Body Condition and Reproduction

- Body condition scores
- Litter sizes and ages

Key Results – Body Condition and Reproduction

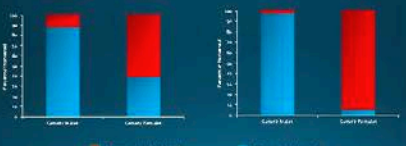
- Declines in body condition since the 1990s
- Declining cub production
- Both closely associated with the timing of spring sea-ice break up
- Annual yearling recruitment ranged from 0.24 to 0.51
- Continues to exhibit the level of reproduction required for a viable population



Next Steps

- Development of harvest management options
- Harvest recommendations

Sex of Harvested Bears



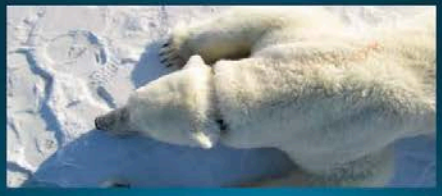
Harvest is 2 males per female in Nunavut and 1 male per female in Greenland.

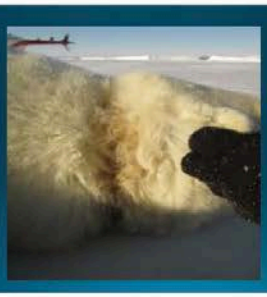
Participants in the Studies

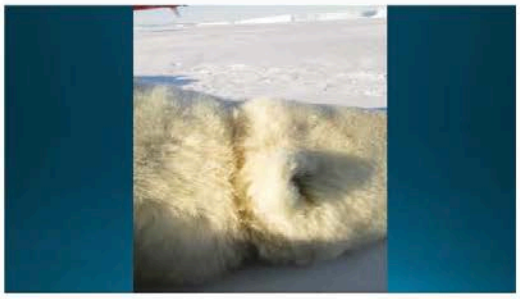
Ivig HTO	Mittimatalik HTO	Hamlet Lag HTO	Halivak HTO
Jopee Kigutak	Adrian Jimmy Pitsolak	Robert Kavtak	Robbie Kolliyalik
Mark Akeeagok	Brian Koonoo	Jaypeeter Kalliktee	Julie Koksiak
	George Koonoo	Bruce J. Hannu	Apostle Apak
		Jacob Jaypoody	Jaloo Koomeloosie

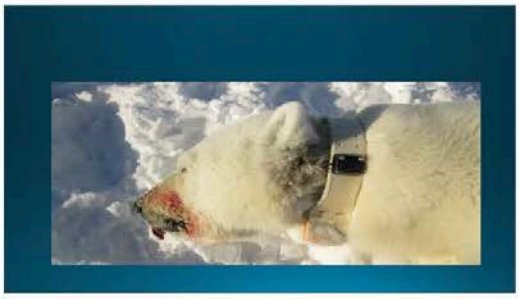
...and many others

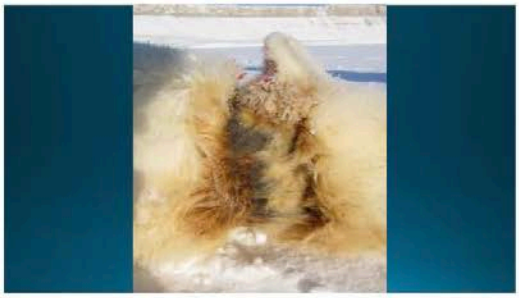
Thank you











Appendix 4: Complete Consultation Summary of Kane Basin and Baffin Bay Community Consultations

Nunavut Community Consultations on the Results from the 2011-2014 Baffin Bay/Kane Basin Polar Bear Study

January 9-15, 2017

Communities HTOs Consulted:
Grise Fiord
Pond Inlet
Clyde River
Qikiqtarjuaq

Background:

The Baffin Bay (BB) and Kane Basin (KB) polar bear sub-populations were surveyed in the 1990s (1993-1997) using capture and tagging methods. These studies estimated population size to be approximately 2074 bears in BB and 164 bears in KB. Population viability analyses and status assessments based on the results from these surveys predicted that both sub-populations would decline due to high harvest and the potential negative effects of long-term reductions in sea-ice habitat. In contrast, local knowledge and IQ indicated that the BB population was stable or increasing while the status of KB was uncertain.

Both BB and KB are harvested by hunters from Nunavut and Greenland. In 2009, an international agreement was signed by Canada, Nunavut and Greenland to help coordinate the management of polar bear in these shared populations. Under this agreement, the Canada-Greenland Joint Commission for the management of polar bears (JC) was established. In 2010, the JC reviewed the available information on polar bears concluding that the scientific information for both populations was out dated and that the IQ information was limited. The JC recommended that new studies be conducted to provide updated scientific information and IQ. This new information was needed in-order to properly manage harvest and to help resolve differences between the current scientific and IQ based status assessments. The JC formed the Scientific Working Group (SWG) to carry out the scientific study of the two sub-populations.

New population surveys in BB and KB were conducted between 2011 and 2014. In response to concerns expressed by Nunavummiut regarding the capture and handling of bears, biopsy darting to collect DNA was used in both surveys. Biopsy darting does not require capture or drugging. By using this genetic mark-recapture technique, levels of capture and handling were reduced by more than 90%. The study results were released by the SWG to the JC in their final report and executive summary (Appendix 7) in July 2016.

For Baffin Bay, results from the survey estimated the population size in 2013-2014 to be 2826 bears. Due to significant differences between the methods used during the 1990s survey and the recent survey, it was not possible to directly compare population estimates from the two studies. It therefore remains unclear whether there has been a true change in population size since the time of the previous study. Although the BB population appears to be abundant and viable at present, results from the recent study suggest that polar bear productivity and general condition are impacted by the long-term deterioration in sea-ice conditions that has been recorded in this region. Reproductive output and overall body condition appear to be declining. Movement patterns on the sea-ice and denning behavior on land are changing. Bears are coming ashore earlier and spending longer on land.

For Kane Basin, results from the survey estimated the population size in 2014/2015 to be approximately 357 bears. This population appears to be stable or possibly increasing. This change in status may be the result of reduced hunting pressure and/or more favorable ice conditions in KB. Hunting pressure in the Greenland sections of KB has been reduced in recent years due to the introduction of a quota and to sea-ice conditions that have made it difficult for hunters to access the area. A decline in multi-year ice and an increase in first-year ice cover may have increased the productivity of this area. Unlike BB, there was no evidence of declines in body condition or reproductive performance between the 1990s and the recent survey.

The combined harvest in BB has averaged 163 bears per year from 1992 to 2014; with a peak harvest of 206 bears in 2003. During this period, harvest levels have changed significantly. In 2004, Nunavut increased the Total Allowable Harvest (TAH) for BB from 64 to 105 tags. Between 2010 and 2014, this TAH was reduced by 10 tags per year over 4 years; bringing it down to 65. In 2006, Greenland introduced its first quota on polar bear hunting, setting a limit on the number of bears harvested each year across all populations but not setting limits on individual populations. The combined harvest in KB has averaged 9 bears annually between 1993 and 2014. During this period most of the harvesting in KB has been conducted by Greenland hunters. The Nunavut TAH has remained unchanged at 5 bears per year but this TAH has rarely been filled (e.g. only 1 bear being harvested between 2011 and 2014).

Consultations with Hunting and Trapping Organizations (HTOs) were conducted in communities that hunt from the KB and BB sub-populations. The communities involved were Grise Fiord for the KB sub-population and Pond Inlet, Clyde River, and Qikiqtarjuaq for the BB sub-population. The purpose of the consultations was to relay the results and findings from the most recent Inuit Qaujimajatuqangit (IQ) (Appendix A) and scientific survey work (Appendix B) done in those areas regarding Polar Bears and collect community feedback on the results.

The development of harvest management recommendations for BB and KB will consider the results from the new surveys and recent IQ studies, along with information on historical harvest levels, further consultations and results from a harvest risk assessment study.

Summary of Consultations:

Grise Fiord
January 9, 2017 Start: 19:30 End: 22:30

Attendees:
Laisa Ningu – HTO member
Aksaryuk Ningu – HTO member
Amon Akeeagok – Director of HTO
Meeka Kigutaq – Mayor of Grise Fiord
Leah Kakee – Public Participant
Larry Audlaluk – Translator
Terry Noah – HTO member
Aimoshee Nutaraqjuk – Public Participant
Jeffrey Qaunnaq – HTO member
James Qillaq – QWB Chairperson
Moshi Kotierk – GN
Erin Keenan – NWMB
Stephen Atkinson – GN
Caryn Smith – GN
Jason Aliqatuqtuq – GN
Will Fletcher – GN Conservation Officer for Grise Fiord
Cheryl Wray – NTI

1. Moshi Kotierk – Social Science Program Update on Survey work regarding IQ from Baffin Bay Residents and elders (Appendix A). Moshi spoke to 82 people in the Baffin Bay communities regarding polar bears.
    a. **Questions/Comments:**
        i. **Aksaryu Ningiu:** Did you go to each house to ask individual people one by one?
        Moshi: Yes, we do what is easiest. We usually designate one person per household to answer the questions.
        ii. **Meeka Kigutaq:** You said most people were not worried about the polar bear populations? Will you tell the government that Inuit are not worried about polar bear populations? So climate change is not affecting the populations? Will the Scientific presentation show this?
        Moshi: no, the understanding is I have is that people are not concerned about climate change affecting polar bear populations.
        iii. **Jeffrey Qaunnaq:** Have you given the results to the minister?
        Moshi: No. There are several steps to go through before the results go to the minister.

2. **Stephen Atkinson Presentation –** The presentation (Appendix B) summarized the results from the 2016 final report on the 2011-2014 polar bear study in Kane Basin and Baffin Bay. Stephen noted that we were there to provide a presentation on the results

of the Kane Basin study and get community feedback. We were not there to discuss a Total Allowable Harvest as that is a premature step. Included in the presentation were the following:

- A review of the history of population studies and the status of the KB population. It was explained how the PBTC and IUCN PBSG, to make the prediction that the KB population was likely to be declining. It was explained how this prediction combined with concern over sea-ice trends in KB had led to the KB being designated a declining population.
- A review of the historical and current harvest in KB. Nunavut TAH of 5 bears has remained unchanged for several decades and is rarely used. Accuracy of harvest records for Greenland is uncertain but has likely improved since 2006 when the quota on polar bear hunting was first introduced. Greenland harvest was around 10 bears annually until 2006 but seems to have decreased since. This decrease in harvest may be due to introduction of a quota combined with reduced access to KB for hunters in Greenland due to poor ice conditions for travel from Qanuaq.
  i. **Question Jeffrey Qaunnaq:** Did the survey conducted in 1994-1997 include Greenland?
     Stephen: Yes.
  ii. **Question Jeffrey Qaunnaq:** Are Greenland harvest numbers before 2005 estimates?
     Stephen: Yes, they were estimates collected from interviews with hunters, so they were approximate. Following 2005 the numbers are considered more accurate because they had to tag bears. There are still questions as to whether the reported numbers are accurate.
- Explanation of the Joint Commission and its role.
- A review of sea-ice studies in Kane Basin showing the long term trends that are being seen. Relative to the 1990s the sea-ice is breaking up earlier and forming later. The area of KB that remains ice covered in the summer has dramatically decreased. KB is moving towards an annual ice regimen.
- A review of the movements of satellite collared bears and genetics in KB, and how these have changed since the 1990s. It was explained that some (16) adult female polar bears were collared and some (20) adult males and subadults (of both sexes) were given satellite ear tags in Nunavut and Greenland for the recent KB study. Photos of the collars and ear tags were shown and it explained how the release mechanisms on the collars function so that the bears do not need to be recaptured for collar removal. Collaring data from the 1990s were also used so that changes in bear movements over the last 20 years could be studied. The results of analysis of the movement data and genetics indicate that the population boundaries remain appropriate for harvest management. The range of the KB population appears to have expanded since the 1990s and bears tend to be located further north in some seasons.
- A review of polar bear habitat use in KB; looking at changes that have occurred since the 1990s. Home range size has increased. Use of land in summer is still

only occasional because some sea-ice remains in KB at this time of year. Habitat use is starting to resemble that of bears in annual ice systems such as BB.

- For the population survey, genetic mark-recapture was used instead of physical capture. It was explained why this method was adopted for the recent study and how it was done. Videos of the biopsy darting were shown to illustrate. Photographs and maps were also presented to help describe how biologists searched for bears during the survey. More than 170 bears were genetically sampled in 2011-213 – more than 50% of bears included in the study were not handled. The new estimate is 357 bears (2013-2014). There are a lot more bears than predicted from population models. Population does not appear to have declined as predicted and has been stable or possibly increasing. It was noted that there has been an increase in densities of bears in north-eastern KB (off the Greenland coast) which may be partly due to reduce Aerial survey is a method that could be used in future to track trends in this population as full scale mark-recaptures are not being done.
- A review of results from the studies of body condition and reproduction. Data were limited and presented no evidence of changes in reproduction since the 1990s. Improvements in body condition were apparent in some classes of bears. These may be linked to changing ice regimen.

Following Stephen Atkinson's presentation there were further questions and comments:

iii. **Question Laisa Ningu:** How much time was spent in the field in the 1990's? A month?
Stephen: A week to 10 days for each year for 5 years. In the 2000s we spent about 3 weeks in the field each time.

iv. **Question Laisa Ningu:** What is the fatality rate for the collars?
Stephen: We didn't have any recorded deaths from the collaring events. One of the things we did in 2015 was to ensure that there were no collars left on bears – if there were any collars remaining on bears we took them off.

v. **Question Laisa Ningu:** So all the collars are accounted for and have you retrieved any of them?
Stephen: We don't have any collars that are still transmitting. Yes we did remove some and the rest dropped off, likely into the sea. *Stephen then showed photographs of the 6 bears that were recaptured to have collars removed. These showed where the fur was flattened under the collar and in one case the hair under the collar had been worn away but there were no wounds caused by the collars.*

vi. **Statement Laisa Ningu:** *(in response to a slide showing a collared bear had traveled from Kane Basin to Russia)* When any animal has a foreign object on them they are trying to get rid of the object so that may be why one of the collared bears moved to Russia.

vii. **Statement Laisa Ningu:** Up until 1962 we lived in Alexandra Fiord and then left and came back – there were more bears the second time I went up. I don't need any scientific data to tell me this.

viii. **Question Amon Akeeagok:** Could the population change be attributed to differences in the level of effort and resources available between the 1990s survey and now?
Stephen: No, the confidence intervals would be more accurate but the estimate change would represent an actual change. The population size estimates were not greatly affected by the effort put into surveys. The population change between the 1990s and now is probably attributable to reduced Greenland harvesting and the sea-ice changes which may be providing better conditions for polar bears and seals. But if the sea-ice changes too much it could be detrimental.

ix. **Statement Jeffrey Qaunnaq:** We have always practiced good conservation practices so that could be the third reason.

x. **Question Jeffrey Qaunnaq:** On slide 33; of the 16 tagged polar bears how many of those collars did you retrieve?
Stephen: We retrieved 6 collars and the others stopped transmitting so they probably fell off into the ocean. There may have been some collars that malfunctioned and stopped transmitting. These would still be on the bears but that is unlikely.

xi. **Statement Jeffrey Qaunnaq:** the Kane Basin boundary should be shifted south to be a bit larger and allow better access.
Stephen: My advice would be for the HTO to bring up the concern that it is hard to access KB and Grise Fiord does not harvest their full TAH. The HTO would need to formally request a boundary change.

xii. **Question Terry Noah:** How long does the collar stay on?
Stephen: 2 years.

xiii. **Question Meeka Kigutaq:** What about the age group? How old can they become?
Stephen: Some bears that were surveyed in 2012-2014 had been captured in the 90s by Mitch Taylor. The oldest bear was 34 years old. One mother with a cub captured during the recent survey had been captured as a cub herself 20 years ago. On both occasions she was captured near the cabins in Alexandra Fiord.

Pond Inlet
January 11, 2017 Start: 19:40 End: 23:30

Attendees:
Jaykolasie Killiktee – HTO member
Mathias Kaunak – HTO member
Elijah Panikpakoochoo – HTO member
Erik Ootoovak – Chairperson HTO
Jodah Inualuk – Secretary HTO
Karen Nutarak – HTO member
Philipusie Paneak – Interpreter
James Qillaq – QWB Chairperson
Moshi Kotierk – GN
Erin Keenan – NWMB
Stephen Atkinson – GN
Caryn Smith – GN
Jason Aliqatuqtuq – GN
George Koonoo – GN Conservation Officer for Pond Inlet
Cheryl Wray – NTI

1. Moshi Kotierk – Social Science Program Update on Survey work regarding IQ from Baffin Bay Residents and elders (Appendix A). Moshi spoke to 82 people in the Baffin Bay communities regarding polar bears.
    a. **Questions/Comments:**
        i. **Statement Elijah Panikpakoochoo:** The information should include the diet of polar bears; we need information on their diets.
        ii. **Question Erik Ootoovak:** What is your personal opinion on the polar bear population: Do you agree that it is increasing?
        Moshi: Yes, I agree with the general public opinion.
        iii. **Statement Elijah Panikpakoochoo:** There are people still here from the 1930's and they know where bears used to be. There used to be few bears at that time. The people that you interviewed did you include them? My first recollection from then is that nobody would catch a polar bear; it would be a surprise if someone did. There were no limits back then. More polar bears seem to be showing up since I moved to the community. The elders have knowledge from the past. We have seen the difference. We built a cabin where I grew up and would hunt seals during the day and polar bears would at night. During the night bears hunt seals in the cracks of the ice. We believe in your results from the interviews.
        iv. **Question James Qillaq:** I would like more information on your report. Do you know what years the polar bears started to increase?
        Moshi: Based on interview we were able to make a graph that shows it happened in the 1960-1970's into the 1980's.

v. **Statement Elijah Panikpakoochoo:** What you are saying is true – there were hardly any bears in the past. We were living on Devon Island at the time and then Bylot Island, I remember I could catch seals on the ice. In the 1960's when we lived there, there were many bears at Devon but less at Pond Inlet. Our fathers didn't know how to hung polar bears but they killed nuisance bears when our meat caches were jeopardized. Over 100 nuisance bears were shot back then. You couldn't hunt for seals because polar bears would get you; you had to hunt with two people for safety. In 1962 we were allowed to play outside in Pond Inlet because there were no bears. In the 1970's there were less seals, fewer seals because of many bears. Our ancestors were good wildlife managers. We cannot cache meat anymore because of polar bears.

2. **Stephen Atkinson Presentation** – Noted that we are here to provide a presentation on results of the Baffin Bay study and get HTO feedback. We were not there to discuss a TAH as that is a premature step. The presentation (Appendix B) covered highlights from the final report submitted to the Joint Commission. Included in the presentation were the following:
    - A review of the history of population studies and the status of the BB population. It was explained how results from the 1990's mark-recapture study and harvest data had been used in population models, by the PBTC and IUCN PBSG, to make the prediction that the BB population had likely declined to <1500 bears by 2004. It was explained how this prediction combined with concern over sea-ice trends in BB had led to the BB population being designated as a declining population and the issuance of a negative NDF under CITES. A the same time, local knowledge and IQ was suggesting that the BB population was not declining.
    - A review of the historical and current harvest in BB. The quota for Baffin Bay is now 65 for Nunavut and around 65 bears for Greenland.
    - Explanation of the Joint Commission and its role.
    - A review of sea-ice studies in Baffin Bay showing the long term trends that are being seen.
    - A review of the movements of satellite collared bears and genetics in BB, and how these have changed since the 1990's. It was explained that no polar bears were collared in Nunavut for the recent BB study because HTOs had not supported this method when the study was being designed. All collaring was done in Greenland. Collaring data from the 1990's (which included bears collared in Nunavut) were used so that changes in bear movements could be studied. The results indicate that the range of the BB population has contracted since the 1990's (likely due to changes in sea-ice) but the population boundaries remain appropriate for harvest management.
    - A review of polar bear habitat use in BB; looking at changes in habitat use that have occurred since the 1990's. Relative to the 1990's, bears are now tending to use sea-ice at lower concentrations, closer to the shore an in shallower waters. They are also coming to land earlier, making more long distance swims to reach

land and spending more time on land during the open water period. Denning has changed also. Bears are entering dens later and making dens on steeper slopes and higher elevations.

- For the population survey, genetic mark-recapture was used instead of physical capture. It was explained why this method was adopted for the recent study and how it was done. Videos of the biopsy darting were shown to illustrate. Photographs and maps were also presented to help describe how biologists searched for bears during the survey. More than 1400 bears were biopsy darted in 2011-2013; more than 95% of bears included in the study were not handled. The new estimate is 2826 bears (2012-2013). There are a lot more bears than predicted from population models. There are a lot of bears in Baffin Bay. It's difficult to say that the population is increasing because the estimate from the 1990's study may have been biased low due to several factors. It was explained how use of smaller search area and the presence of bears on offshore ice during the 1990's could have resulted in an underestimate of population abundance in the 1990's. Stephen Atikinson noted that we don't fully know how much the population may have been underestimated in the 1990's but it could have been quite a lot. He also noted that we can be certain the population has not gone below 1500 bears as was previously predicted.
- A review of results from the studies of body condition and reproduction. Condition appears to be declining since the 1990's as does reproductive performance. Both appear to be closely linked to the changing sea-ice. However, it was noted that the population still seems to be viable in terms of reproductive output.

Following Stephen Atkinson's presentation there were further questions and comments:

i. **Question Erik Ootoovak:** How often do polar bears swim in comparison to being on land?When bears ae in water the collar isn't transmitting.
   Stephen: We do have that information but I do not have it with me, it is included in the full report.
ii. **Question to HTO from Stephen Atkinson:** Do they have any knowledge as to why bears are denning higher in the mountains than they used to.
iii. **Question Erik Ootoovak:** we know that bears don't only den in the mountains but also on the sea ice. Do you have information on the percentage of bears that are denning on the ice?
   Stephen: We didn't detect any maternity dens on ice but I know in Alaska they do detect that, we just haven't. We are also aware that there are other kinds of dens.
iv. **Statement Erik Ootoovak:** The elders say that the bears that have maternity dens on the sea ice seem to be bigger.
v. **Question to HTO from Stephen Atkinson:** Have polar bears shifted their distribution deeper into the fiords or did the 1990's study just not include the back of the fiords?

vi. **Question Erik Ootoovak:** Out of curiosity, do you have a ratio of poor/fair/good body condition of the bears? For example, out of 20 bears how many are poor or good?
Stephen: All the ratios are in the report.

vii. **Statement Elijah Panikpakoochoo:** The comment about the bears being thinner today. I don't agree with that statement. In the 1970's there was a really thin polar bear caught and I think that not all animals will be fat. Inuit beliefs are that some bears are very capable hunters and that's why they are fat, but some bears are not that good at seal hunting so they are thinner. I don't think it's true that they are thinner because of thin ice. It's because some are good hunters and others are not. My second point is regarding your comment about bears denning along the coast line. Inuit have always known that if some bears are pregnant that sometimes they will give birth where they cannon make a den. If there is no place then they take the cub in their mouth and carry them onto the land (it could be a premature cub). My third comment is that you say they spend more time on the coasts of Baffin and Greenland. Inuit know that wildlife don't have "homes". They don't know the difference between Canada and Greenland. If I studied cattle down south and told them that they were endangered they wouldn't believe me. It has been stated that bears are spending more of their time on Baffin but they change all the time where they spend their time. We were in disagreement with the previous studies. We told you polar bears weren't endangered and you didn't listen.

viii. **Question Jaykolasie Killiktee:** Do you know if the DNA or blood changes if they move to other places?
Stephen: The DNA doesn't change per individual bear, but the DNA is different between populations like between Lancaster Sound and Baffin Bay for example.

ix. **Question Jaykolasie Killiktee:** I knoticed some of your presentation is not included in our print outs. Why aren't they included in our print outs. We would like the full presentation.
Stephen: We will leave a copy with the HTO office.

x. **Statement Mathias Kaunak:** You did your research in the fall. You were here for about 2 weeks and you could only fly for 3 days. If you use I Q more you can schedule your time with the weather and would have more believable data.
Stephen: We had trouble with the weather in Pond, we knew that we would have trouble here. We had good weather in other areas. We had to do the study when we did because we cannot fly out onto the ice/open water when bears are still on the ice. It's a safety issue. We timed the work so bears would be on land. This means we encounter bad weather but we allow for that in our schedule. Although we had a lot of weather days in Pond Inlet we still managed to get the things done that we needed to.

xi. **Question Karen Nutarak:** I would like to ask elders if bears hunt in open water.
Elijah Panikpakoochoo: we have observed when we are out on the boat, that we will see bears on the coast but the males spend more time in the open

water. Especially if it's storming, they will go into the water because seals will rest in the water when it's storming and the bears can hunt them easier.
Karen Nutarak: I believe that bears are very adaptable like we adapt to our changes up here. We are only allowed to kill males so I feel like there are going to be too many females in comparison to males.
Stephen: It is possible to hunt too many males but If you harvest about 2 males for every 1 female the population stabilizes at about 60% females versus 40% males. Every year there are some females that are not available to mate. In response to the comment about bears hunting in open water, we recorded lots of polar bears killing prey (seals, fish, walrus, even shark). There's been some diet analysis and it shows a large percentage of harp seals. The harp seal population has also gone up significantly so the polar bears are likely responding to that. This shows adaptation.

xii. **Statement Erik Ootoova:** Greenpeace or biologists always try to state in the media that the lack of sea ice is going to decrease the population. We disagree with that and believe the opposite, that with less ice the bears are going to be able hunt more successfully. We think polar bears prefer to be in the water.
Stephen: Interesting that you say that as we just came from Grise Fiord were we presented on the Kane Basin study. The Kane Basin study shows that the population there has increased and may be due to the changes in sea ice creating better hunting habitat for the polar bears. At what point will we get to when there's too little ice for the bears. The concern is whether the bears can survive without ice at all. Too much ice (too thick) or too little ice is not ideal for the bears, somewhere in the middle is optimal. How adaptable are they?

xiii. **Statement Karen Nutarak:** I have heard from an elder that there are bears that literally live in the water; they rarely come out of the water, and they are fatter bears.

xiv. **Question Erik Ootoova:** Is there only one species of polar bear?
Stephen: As far as the definition of species goes, polar bears are not distinct enough from each other to be different species. I have studied polar bears for the last 25 years. Once in a while I see bears that look very different from most others, with square heads, very muscular necks, so I believe some could be different enough to be considered a sub-species.

xv. **Question to HTO from Stephen Atkinson:** I wanted to ask again if you have knowledge as to why female polar bears are going to higher ground to den. We have seen this. Why do you think this is? Why do you think we are seeing dens at a much higher altitude?
Elijah Panikpakoochoo: polar bears have always gone to higher areas so they are out of reach of other polar bears. In fall we have always seen bears go higher as there is more snow in the higher parts and they can dig deeper dens. Male bears den too if they are nice and fat. Males will come out much sooner than females with cubs. A male has been harvested in February from a den. Tulayuiqtuq are really big and heavy bears that they cannot be on the land as they were raised on the ice and water. They can't walk on rocks and land as

they are too heavy. We tried to track it but it went back into the water. Since these bears were born on the ice and raised in the water they are much bigger and are too heavy to live on the land. I saw a print that was 19 inches by 16 inches. I once saw a 12 foot bear that was aged 5 years old. It was 14 feet by the time it was completed by at the taxidermist.

xvi. **Question Jaykolosie Killiktee:** The satellite data between here and Greenland there seems to be a lot of lines. Is this data from the winter or summer?
Stephen: It's in the report. It was movement from all seasons for all the years of the study laid over each other.

xvii. **Statement Elijah Panikpakoochoo:** you stated that you said more bears are thinner. We know nuisance bears that are chased away these days having hearing impairments from the bangers or gun shots. I drove right next to a polar bear on skidoo and it didn't notice me until it turned its head. Hearing impaired bears go to communities more because they don't have the hearing to hunt on the ice. When bears eat from dumps they don't defecate out the garbage bags. We once found a polar bear that had a stomach full of plastic garbage bags. We can't eat that meat. If polar bear hunting is banned outright what ae we supposed to survive on? We have to make sure we consider all things when quotas of caribou and bears are cut as some of us can't afford store bought food. If we hunt more bears, the seal population will rise and we can harvest the seals.

xviii. **Question to HTO from Stephen Atkinson:** During the presentation, I stated that we thought there was a difference between the 1990's and what we did in the 2000's. In the 90s few bears were caught in the fiords but in this recent study we captured a lot in the fiords. I think the difference is that we went into fiords to look for them. Do you think in the 90s that if we had searched for bears in the fiords, that we would have found them?
Elijah Panikpakoochoo: It depends on the snow conditions. If there is less snow then they will go higher up to where the snow is.
James Qillaq to Elijah Panikpakoochoo: you stated that since the quota has been placed that they have been eating more seals. I just want to comment that bear populations increasing that the bears will go further and higher. We also have to remember that young people have better communication today. More ice breakers are coming north and breaking ice, it has a great effect. I just wanted to comment to Stephen that ice breakers do have an effect. In 2011-2015 Greenland conducted their own study – NTI and I were involved in a teleconference in December. Is it translated yet?

xix. **Question Jaykoloasie Killiktee:** Our quota has been cut every year and I seem to see that by 2020 or 2030 we won't be able to hunt any polar bears.
Stephen: The TAH has been going down but there is no current plan to drop the TAH to 0. Right now our plan is to review the new data and try to come up with a new management plan and harvest recommendations.

James Qillaq: Some people want to put polar bears on the endangered species list but we have our own laws and we want to do our own study. NTI and GN have been working together on this.

Stephen: One of the things we need to consider for the future, we have always wanted to try to increase the population. We need to seriously consider bringing the polar bear population down to a more reasonable number. It will be very difficult to convince the Federal Government regarding this, but it's something we should think about. We need to determine where the population should be.

xx. **Question to the HTO from Stephen Atkinson:** There is a lot of interest in continuing monitoring the population. We have considered using some collars. Does the HTO have interest in that type of work in the future knowing the quality of the data we get from collars?

Elijah Panikpakoochoo: we were worried about bears but that is not the case anymore. So we will consider the collars in the future. We try to cache meat where we know there are fewer bears but polar bears still eat them. We lose money because of lost food caches.

xxi. **Statement James Qillaq:** Don't forget he's not here to discuss harvest quotas. That's not what this meeting is about. Those consultations will occur in the future.

xxii. **Question George Koonoo:** Is there a plan to lift the ban on the polar bear trade?

Stephen: The simple answer is I don't know, but we have new scientific data that could be used to revisit the ban. The ban is not put in place by the Government of Nunavut, it was put in place by the Federal Government and CITES. There is a good chance that it will be looked at. I have brought with me a document from Environment Canada about the export ban. It has a number of questions and answers that people may be interested in.

Cheryl Wray: Paul has told me that NTI and GN are looking at drafting a letter to the Federal Minister discussing this specific subject.

xxiii. **Statement Jodah Inualuk:** In the 70s there was a ban on hunting geese – the population exploded. I think that this is going to happen with bears. I think the quota system has played a role in the increase of bears. Similar things have happened elsewhere in other regions when there were hunting restrictions.

xxiv. **Question Erik Ootoova:** Why do we still have a quota system when the hides are worth nothing?

Stephen: Canada has argues on the International stage that because we have good quotas and good management and hunting is not detrimental to the population so we should be able to trade polar bears and sell hides. The quota system is one of the things required to prove to the rest of the world that we are managing our populations.

Clyde River
January 13, 2017 Start: 19:00 End: 22:30

Attendees:
Jerry Natanine – HTO Chairperson
Mosa Palituq – HTO member
Sam Palituq – HTO member
Nysana Qillaq –HTO member
Steven Aipellee – Secretary/Treasurer HTO
Joamie Apak – HTO member
Gordon Kautuk – HTO manager
Apusei Apak – HTO member
Gary Aipellee – Interpreter
James Qillaq – QWB Chairperson
Moshi Kotierk – GN
Erin Keenan – NWMB
Stephen Atkinson – GN
Caryn Smith – GN
Jason Aliqatuqtuq – GN
BJ Hainnu – GN Conservation Officer for Clyde River
Cheryl Wray – NTI

1. Moshi Kotierk – Social Science Program Update on Survey work regarding IQ from Baffin Bay Residents and elders (Appendix A). Moshi spoke to 82 people in the Baffin Bay communities regarding polar bears.
    a. **Questions/Comments:**
        i. **Question Apusei Apak:** Are you going to do more studies like this?
        Moshi: I am not sure if I will be doing this type of work again – it depends on the funding available. When I started this project some people didn't think that what I was doing was right or that it is in the right direction. If we continue this we will need to make a few changes.
        ii. **Statement Steven Aipellee:** I like this program – you could interview different age groups. You could interview other people like biologists and NWMB.
        Moshi: Where I work we also have the polar bear biologist and he suggested we could invite other group. We try to involve different types of people.
        iii. **Statement Steven Aipellee:** If we wanted to get the community involved in terms of what they see in the past, we could do some of that too. It's also beneficial to have youth and other organizations involved. We strongly believe that a local organization could continue this type of works as well.
        iv. **Question Mosa Palituq:** Do you plan to continue this type of work in the future in the communities you have done this in?
        Moshi: I am hoping to. I think I could do this for other departments too. I want to do this in Arviat so I can say have done this in all three regions. Some Inuit

have stated that they are tired of being interviewed while some are being interviewed for the first time.

2. **Stephen Atkinson Presentation** – Noted that we are here to provide a presentation on results of the Baffin Bay study and get your feedback. Not here to discuss a TAH as that is a premature step. The presentation covered highlights from the final report submitted to the Joint Commission. Included in the presentation were the following:
    - A review of the history of population studies and the status of the BB population. It was explained how results from the 1990's mark-recapture study and harvest data had been used in population models, by the PBTC and IUCN PBSG, to make the prediction that the BB population had likely declined to <1500 bears by 2004. It was explained how this prediction combined with concern over sea-ice trends in BB had led to the BB population being designated as a declining population and the issuance of a negative NDF under CITES. A the same time, local knowledge and IQ was suggesting that the BB population was not declining.
    - A review of the historical and current harvest in BB. The quota for Baffin Bay is now 65 for Nunavut and around 65 bears for Greenland.
    - Explanation of the Joint Commission and its role.
    - A review of sea-ice studies in Baffin Bay showing the long term trends that are being seen.
    - A review of the movements of satellite collared bears and genetics in BB, and how these have changed since the 1990's. It was explained that no polar bears were collared in Nunavut for the recent BB study because HTOs had not supported this method when the study was being designed. All collaring was done in Greenland. Collaring data from the 1990's (which included bears collared in Nunavut) were used so that changes in bear movements could be studied. The results indicate that the range of the BB population has contracted since the 1990's (likely due to changes in sea-ice) but the population boundaries remain appropriate for harvest management.
    - A review of polar bear habitat use in BB; looking at changes in habitat use that have occurred since the 1990's. Relative to the 1990's, bears are now tending to use sea-ice at lower concentrations, closer to the shore an in shallower waters. They are also coming to land earlier, making more long distance swims to reach land and spending more time on land during the open water period. Denning has changed also. Bears are entering dens later and making dens on steeper slopes and higher elevations.
    - For the population survey, genetic mark-recapture was used instead of physical capture. It was explained why this method was adopted for the recent study and how it was done. Videos of the biopsy darting were shown to illustrate. Photographs and maps were also presented to help describe how biologists searched for bears during the survey. More than 1400 bears were biopsy darted in 2011-2013; more than 95% of bears included in the study were not handled. The new estimate is 2826 bears (2012-2013). There are a lot more bears than

predicted from population models. There are a lot of bears in Baffin Bay. It's difficult to say that the population is increasing because the estimate from the 1990's study may have been biased low due to several factors. It was explained how use of smaller search area and the presence of bears on offshore ice during the 1990's could have resulted in an underestimate of population abundance in the 1990's. Stephen Atikinson noted that we don't fully know how much the population may have been underestimated in the 1990's but it could have been quite a lot. He also noted that we can be certain the population has not gone below 1500 bears as was previously predicted.

- A review of results from the studies of body condition and reproduction. Condition appears to be declining since the 1990's as does reproductive performance. Both appear to be closely linked to the changing sea-ice. However, it was noted that the population still seems to be viable in terms of reproductive output.

Following Stephen Atkinson's presentation there were further questions and comments:

i. **Statement James Qillaq:** If you have questions on this presentation refer to the page number on the slides so we can go back to it.
ii. **Question to HTO from Stephen Atkinson:** We don't know why the bears are going into their dens later in the fall or denning at higher altitudes. We have some ideas why this may be occurring but I would like your feedback on this.
iii. **Question Jerry Natanine:** On the estimate in the 1990s, they were coming and telling us there was a certain amount of bears and it is now considered an underestimate. I want to know how much of an underestimate.
Stephen: We were able to find polar bears further inland than they did in the 90s. We think it was a difference in the areas surveyed. We aren't able to know for sure whether the 90s study looked that far inland, we only know where they found bears and that was only along the coastline. That's part of the explanation for the underestimate. Another part is because there were still many collared bears out on the sea ice during the study in the 90s so they weren't included/captured in the study. They were unable to search out there as it is too dangerous for the flying but the collars showed that they were out on the sea ice. Less than 30% of collared bears were actually in the study area during the 90s.
iv. **Question to HTO from Stephen Atkinson:** Do you think in the 1990s that there were bears in the fiords?
Jerry Natanine: Nodded to indicate yes in response to this question.
v. **Question James Qillaq:** Slide 10 - 1997 was the first time I saw a collared bear. This bear died from the collar. It was a different type of collar that wouldn't fall off. The collars used today are different and they fall off. I think this new technology is good. Satellite imagery is a powerful tool to be used as well as technology is always advancing.
Stephen: These ear transmitters only stay on for about 55 days. The collars have developed a lot in the last few years. These new collars have a black box

holding a mechanism that will pop off and release the collar on a specific date. These pop off collars are being used more and you don't have to recapture the bear to remove it. Collaring has come a long way. We didn't collar any polar bears in Nunavut for this study but there are plans to do future monitoring of polar bears in Baffin Bay and we may want to include collars as part of that work.

vi. **Question to HTO from Stephen Atkinson:** We want to know, if we were interested in putting out satellite transmitters or collars on bears in the future, would the community consider it and possibly accept that request? You would also get that information and request in writing.

vii. **Question Steven Aipellee:** Are there reported deaths due to the collars?
Stephen: I am not sure of the last time a bear was reported to have died from a collar. Certainly not with the work I have conducted or in this study.

viii. **Question Jerry Natanie:** Do you go inland to look for tracks?
Stephen: We look for any sign of polar bears – tracks, seal kills, etc.

ix. **Question Gordon Kautuk:** Since the transmitters they make nowadays can be very small, why can't we use the small ones [on bears] or put them under their skin?
Stephen: Polar bears lifestyles are so rough that they beat up the transmitters. Part of the reason the collars are their current size is because they are protected. They also have a longer battery life; the collars we use today provide a constant battery life for up to four years. You can put tiny satellite tags on tiny birds but they have to have antennae and have a shorter battery life. We have found that the antennae break off when they are on the bears. When we put the collars on now, we put them on loose enough on the bears that they can pull them off their heads. We lose about 40% as they do pull them off sometimes. But that's an acceptable loss. The technology may be even better ten years from now.

x. **Question Steven Aipellee:** Slide 14 on the sea ice. In the 90's there was less marine traffic in the area but now we are seeing more marine traffic like ice breakers and they are leaving later in the year. Di you consider that when you looked at the ice break up?
Stephen: We did not factor that in during the study. This point was brought up in Pond Inlet as well. The greatest loss of sea ice is seen along Greenland and that is not really an icebreaker lane. The Greenland current is certainly getting warmer. The marine traffic is probably a contributing factor to the faster break up of ice.

xi. **Question Steven Aipellee:** Do you think polar bears are catching more seals because Inuit are not hunting them as much anymore due to increased costs to do it. The seal population seems less and we are harvesting fewer.
Stephen: I am not sure. There was polar bear diet analysis and it shows that harp seals are increasing in the polar bear diet, but it's still mostly ring seals. Harp seals come up in the open water so with the sea ice changing, the bears seem to be adapting and feeding on harp seals.

xii. **Statement James Qilliq:** I want to raise the issue that came up in the 1970s, with the polar bear population increases the TAH was being raised. But with bears moving further inland, we are seeing fewer seals in the fiords or close to land. With more polar bears we are seeing fewer seals. Inuit can have different values and that is what is reported.

xiii. **Question Steven Aipellee:** How many bears out of the 1400 biopsied bears were biopsied more than one year?
Stephen: There was about 300-400 repeat biopsied. Some bears were biopsied in all three years. A small number of bears were biopsied twice in one year because we had not markings to indicate they were already biopsied.

xiv. **Statement Steven Aipellee/Jerry Natanine:** Moshi and Stephen gave very clear presentations to us today. We have more knowledge and the presentations seemed very accurate. We know a lot more about the study and the polar bears. We thank you for this.

xv. **Statement BJ Hainnu:** The study that was done by Mitch Taylor, they were not seeing them in the fiord as it wasn't searched.
Stephen: In the 1990's if you had flown into the fiords/inlets where they did not appear to catch bears in the 1990s, would there have been polar bears there at that time?
BJ Hainnu/Jerry Natanine: Yes, absolutely there would have been bears in those fiords and inlets.

xvi. **Statement Stephen Atkinson:** Jerry had asked me how much the 1990 studies had under estimated. Because we had a couple of significant issues such as fiords not being surveyed and bears out on the ice where we couldn't fly it is difficult to fully assess the implications. We tried to assess what effect the reduced sampling in the fiords in the 1990s could have had on the population estimate. We restricted the data collected during the recent survey to just those bears that were encountered within the same sampling area as the 1990s survey. We then recalculated the population estimate to see what effect this smaller sampling area would have. Just by narrowing the sampling area in this way reduced the population estimate by about 400 bears. So this suggests that the effect is quite large. We could not correct for the bears that were on the ice so we don't know how this affected the estimate.

xvii. **Question Nysana Qillaq:** When you are darting the polar bears to get a sample, would you consider using a paint ball to mark the bears?
Stephen: We have used some darts that leave dye marks but the regular paint balls will wash off as soon as it goes in water. The crayons used in the 1990s couldn't be used in the biopsy darts because it is a solid material, not paint. We used a special type of biopsy dart that could take a DNA sample and leave a dye mark on the bear. I was a livestock dye that was diluted. It would stay on for about 4-5 days (which was about the time we would be in that area). They were only used to mark cubs in a litter when we had difficulty telling the difference between cubs.

xiv. **Statement Sam Palituq:** We used to use colored markers for the bears previously. We used different colors so we knew if we had handled them previously. In one of the presentation slides with the sea ice years. In the 90s the sea ice was a lot healthier then. Since 2012 the bears tend to go more inland. There seems to be more salt in the water these days. The bears are looking for food further inland. The bears don't tend to stay in one area.

xv. **Question Apusei Apak:** For the future projects you will need to definitely focus on the valleys and fiords inland. Can the studies go further inland during future studies? I think you will have more results then.
Stephen: We made an effort to get inland during this study. While we know that bears are going further inland, the numbers of bears are so few it would not be cost effective. It would be very expensive but wouldn't change the population numbers very much. I think what would be useful is if we spent more time in communities when designing future surveys and you can tell us where inland we are most likely to find them. This might help us focus on some far inland areas where bears are more likely to spend time. This could be more cost effective.

xvi. **Question Jerry Natanine:** If we decide not to sell hides will this impact the quota?
Stephen: Technically, whether hides are sold or not should have no implication for the quota. Canada has also defended the position that the auction price of polar bear hides has not influenced the size of polar bear quotas. So whether you decide to sell hides should not affect the TAH. The GN stands behind the idea that the trade of hides does not impact the TAH.

xvii. **Statement Steven Aipellee:** There should be compensation for the harvesting of fewer bears because of the underestimation of bears.

Qikiqtarjuaq
January 15, 2017 Start: 15:15 End: 19:30

Attendees:
Levi Nutaralaq – HTO member
Juilie Koksiak – HTO member (assisted in most recent study)
Jacobie Audlakiak – HTO Chairperson
Loasie Alikatuktuk –HTO member
Robbie Kullualik – HTO member (assisted in most recent study)
Alison Kopalie – HTO member
Loasie Audlakiak – HTO member
Martha Newkingak – Interpreter
Johnny Kooneeliusie – Public participant
James Qillaq – QWB Chairperson
Moshi Kotierk – GN

Erin Keenan – NWMB
Stephen Atkinson – GN
Caryn Smith – GN
Jason Aliqatuqtuq – GN
Cheryl Wray – NTI

1. Moshi Kotierk – Social Science Program Update on Survey work regarding IQ from Baffin Bay Residents and elders (Appendix A). Moshi spoke to 82 people in the Baffin Bay communities regarding polar bears.
   a. **Questions/Comments:**
      i. **Statement Levi Nutaralaq:** Although we aren't certain of exact numbers of wildlife that is just the way of Inuit. We have different lifestyles in the communities. We are always told we are losing our polar bears, that populations are decreasing and to only hunt males. Wildlife fluctuates in numbers. We used to not have many polar bears but now they are moving in.
      ii. **Statement Loasie Audlakiak:** We understand the movements of polar bears and I've noticed that the number of bears is increasing. We don't get many seals anymore; maybe that's why bears are starting to come around the communities. They are always looking for food, when they don't find any they move on; but they'll be back. Maybe not next year but maybe in a few years. There were no caribou when I was born here. Our elders said they would come back.
      iii. **Statement Jacopie Audlakiak:** From the numbers you showed I believe the results. Research results don't usually lie. There are more polar bears this year than before. Polar bear numbers don't ever stay the same. The polar bears are in areas that we hadn't seen them before link on top of mountains.
      iv. **Statement Loasie Alikatuktuk:** While I was growing up we would see wildlife dependent on seasons. Some years there would be a lot of bears and some we wouldn't see very many. My parents used to speak about caribou fluctuating year to year. I remember a year when there was many caribou in the fiord. Some years are lean years but we believe they will come back, some think in about 20 years.
      v. **Question Loasie Aliktuktuk:** Inuit are not the only ones that kill bears. Sometimes we find bears that have died from other bears What do you do about those types of kills that have died from other means besides human caused?
      Jason Aliqatuqtuq: If you come across a bear that has died on the land that isn't human caused, then you can bring samples to the Conservation Officer. We take a tag for that bear because it needs to be accounted for no matter how it is killed.
      vi. **Question Loasie Alikatutuk:** There have been a number of times that there are bears that have died in the fiord. We have witnessed this and some have no flesh on them anymore. We don't give it to the wildlife office – we didn't know

that we were meant to give samples to the Conservation Officer. We weren't sure how they died or when they died.
Jason Aliqatuqtuq: Just mention it to the Wildlife Officer; tell them what and where you have seen these carcasses.

vii. **Question Loasie Audlakiak:** Are you continuing on with this research?
Moshi: We are not sure who is going to continue the research.

viii. **Question Robbie Kullualik:** I have an understanding of your results. Is there going to be any change in the legislation or research priorities? We seem to be getting more regulations, as hunters we are kept from harvesting our animals. Are we going to be more regulated in the future for wildlife harvesting? It seems that we will not be able to harvest bears in the future.
Moshi: I am not sure what is going to happen in the future but from what I understand, the Inuit harvesting rights are protected by the NLCA.

ix. **Question Levi Nutaralaq:** Are they throwing away the dead polar bear hides that are found on the land? What is happening with the hides?
Moshi: I am not sure; Stephen will be speaking more about the research on the bears.

2. **Stephen Atkinson Presentation** – Noted that we are here to provide a presentation on results of the Baffin Bay study and get your feedback. Not here to discuss a TAH as that is a premature step. The presentation covered highlights from the final report submitted to the Joint Commission. Included in the presentation were the following:
    - A review of the history of population studies and the status of the BB population. It was explained how results from the 1990's mark-recapture study and harvest data had been used in population models, by the PBTC and IUCN PBSG, to make the prediction that the BB population had likely declined to <1500 bears by 2004. It was explained how this prediction combined with concern over sea-ice trends in BB had led to the BB population being designated as a declining population and the issuance of a negative NDF under CITES. A the same time, local knowledge and IQ was suggesting that the BB population was not declining.
    - A review of the historical and current harvest in BB. The quota for Baffin Bay is now 65 for Nunavut and around 65 bears for Greenland.
    - Explanation of the Joint Commission and its role.
    - A review of sea-ice studies in Baffin Bay showing the long term trends that are being seen.
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- For the population survey, genetic mark-recapture was used instead of physical capture. It was explained why this method was adopted for the recent study and how it was done. Videos of the biopsy darting were shown to illustrate. Photographs and maps were also presented to help describe how biologists searched for bears during the survey. More than 1400 bears were biopsy darted in 2011-2013; more than 95% of bears included in the study were not handled. The new estimate is 2826 bears (2012-2013). There are a lot more bears than predicted from population models. There are a lot of bears in Baffin Bay. It's difficult to say that the population is increasing because the estimate from the 1990's study may have been biased low due to several factors. It was explained how use of smaller search area and the presence of bears on offshore ice during the 1990's could have resulted in an underestimate of population abundance in the 1990's. Stephen Atikinson noted that we don't fully know how much the population may have been underestimated in the 1990's but it could have been quite a lot. He also noted that we can be certain the population has not gone below 1500 bears as was previously predicted.
- A review of results from the studies of body condition and reproduction. Condition appears to be declining since the 1990's as does reproductive performance. Both appear to be closely linked to the changing sea-ice. However, it was noted that the population still seems to be viable in terms of reproductive output.

Following Stephen Atkinson's presentation there were further questions and comments:

i. **Statement Stephen Atkinson:** There was a statement earlier in the meeting that the harvest of polar bears would eventually be stopped. I would not be concerned about that. This is a healthy population. The joint commission will come up with a TAH and conduct community consultations. There will be more discussions with you.
ii. **Question Jaypeetee Nookiguak:** The map in our handouts, are they just showing the movements of females?
Stephen: Yes those are just showing females. The male movements are in the full report.
Jaypeetee: With the reduction of the ice the females with cubs aren't moving as far and they stay away from ice because of the males. I found dead cubs that were likely killed by an adult male on the floe edge. For the years to come we will continue to lose ice.

Stephen: I agree that when females have cubs they stay away from the floe edge as males are there.

iii. **Question Jaypeetee Nookiguak:** Elders have told us that because the snow and ice are receding, bears are now moving further north and higher into the mountains. Greenland waters are 10C warmer than our Baffin waters. What is the reason? You hardly get ice forming in Greenland.
Stephen: What we see now is that bears today are not using the southern and eastern extents of their historical areas from the 1990s. The reason why the ice is breaking up earlier is because of the North Atlantic current which is bringing warm waters to the west coast of Greenland. You probably see a lot of scientists on the news saying that the bears are going to go extinct. We need to be careful in saying that as we don't know what is going to happen with the bears but we should be concerned.

iv. **Statement Jaypeetee Nookiguak:** In the 90s we saw 42 bears in 2 days about 60 miles from here.

v. **Question Jacopie Audlakiak:** When will you conduct another study/research in this area?
Stephen: there was about 14 years between the 1990s study and the 2000s study. There is talk that the GN would like to come up and do more research in 4-5 years. We don't know what that research looks like. It might be biopsy darting. The Polar Bear Biologist has asked me to make a request to the HTO if you would be interested in having collars on bears as part of that new work in 4-5 years. This would be done so that we could get more information on how the bears are behaving with the changing environment. A letter request will be sent with regards to collars.

vi. **Statement Jacopie Audlakiak:** Perhaps we can clarify on the collar movement maps, if it is a male, a female or a female with a cub.
Stephen: Yes, we have maps with that information within the report but I completely understand what you are saying.

vii. **Question Loasie Audlakiak:** I didn't understand one of your slides in Inuktitut. Slide 19. I didn't understand what you were trying to say on this slide.
Stephen: 1979-2014 we looked at satellite images and we calculated how many days of the year the area was covered in sea ice. This slide shows the number of days per decade of loss of sea ice.

viii. **Question Jaypeetee Nookiguak:** We need to monitor the collars placed on bears as I have seen bears where it was very skinny due to the collar. How long do the batteries last on the collar? Will the collar battery die while the bear is still wearing it? Can we see the condition of the bears with these collars? Maybe we can think of less invasive ways to monitor them? We have seen a collar on the land that had been placed on the bear. We need to make sure it's not on too tight. If they are growing bears and it out grew the collar will it injure it? Maybe we need to only collar grown bears.
Stephen: The collar design has changed a lot in the years. The past collars would cause injuries. Now when we collar bears we only collar fully grown bears. We place the collars loose so that bears can remove the collar. We have 40% lost due to this. We program collars to release after a certain amount of time. The collars are getting lighter,

the material we use isn't so harmful to the skin. Collar batteries transmit up to 4 years now but we only allow them to stay on for 2 years.

ix. **Question Robbie Kullualik:** We had tagged char previously with the satellite that was very tiny. Maybe we can use small satellites for bears as well. Why can't we use smaller transmitters on bears?
Stephen: These small transmitters have a very short battery life. Those little transmitters are easy to damage and bears live a rough lifestyle so it wouldn't last very long and just break. The reason why we use large collars is to protect the battery and the transmitter. The ear tag with antennae only last about 50 days as the antennae will freeze off or the instrument gets ripped out.
James Qillaq: Historically people didn't want to consume the meat of a bear that was collared due to the drugs. I have been told that this was very invasive but we should consider this due to the information the collars provide.

x. **Question Stephen Atkinson:** I mentioned that we found a difference in where we were searching for bears between the 1990s and the 2000s. We think the difference was that there was very little searching in the fiords in the 1990s. If they had searched the fiords in the 1990s, would they have found bears or has the distribution of bears changed? Are you seeing more of them in the fiords now?
Loasie Alikaktuktuk: My brother and I were caribou hunting and we saw between 20-25 bears in Cape Hooper. There are more in the fiords now. In the past we would go caribou hunting in the fiords and we didn't see that many. There are more bears in the fiords than in the 90s.

xi. **Question Robbie Kullualik:** Was the survey conducted by helicopter in the 90s?
Stephen: Yes, it was but we don't have a GPS track so we only know where they captured bears and not where they searched.

xii. **Question Loasie Audlakiak:** The loss of sea ice will definitely impact the polar bears. I just want to make sure I understand what the difference between ear tags and collars are. Are the ear tags better but they just get damaged?
Stephen: They do both transmit to a satellite but the ear tags have a shorter batter life, they don't last as long as the collars, the ear tags don't collect as much data as the satellite collar and the collars are much sturdier. The ear tags break much more easily than the satellite collars.