**NUNAVUT WILDLIFE MANAGEMENT BOARD**
**Agenda: Regular Meeting No. RM 004-2017**
**Tuesday, December 5, 2017 (9:00AM to 4:30PM)**
**NWMB Boardroom, Iqaluit, Nunavut**

| | No: | Item: | Tab: | Presenter: | Maximum Time |
|---|---|---|---|---|---|
| *9:00AM to 9:05AM* | 1 | Call to Order / Opening Prayer | | Acting Chairperson | 5 Minutes |
| *9:05AM to 9:10AM* | 2 | Opening Remarks and Introductions | | Acting Chairperson | 5 Minutes |
| *9:10AM to 9:15AM* | 3 | Agenda Review and Approval | 1 | Acting Chairperson | 5 Minutes |
| | | **Department of Environment-GN (DOE-NU): Issues/Decisions** | | | |
| *9:15AM to 9:45AM* | 4 | Caribou Sport Hunt Limit | 2 | GN-DOE | 30 Minutes |
| *9:45AM to 10:00AM* | 5 | Information on the progress of the community-based management plan for Bathurst Caribou in Nunavut | 3 | GN-DOE | 15 Minutes |
| *10:00AM to 10:15AM* | 6 | Information on the progress of the community-based management plan for the Bluenose-East Caribou in Nunavut | 4 | GN-DOE | 15 Minutes |
| *10:15AM to 10:30AM* | | ***BREAK*** | | | 15 Minutes |
| | | **Fisheries and Oceans Canada (DFO): Issues/Decisions** | | | |
| *10:30AM to 11:00AM* | 7 | Northern and Striped Shrimp Integrated Fisheries Management Plan | 5 | DFO | 30 Minutes |
| *11:00AM to 11:15AM* | 8 | Oceans Act Marine Protected Areas | 6 | DFO | 15 Minutes |
| *11:15AM to 11:30AM* | 9 | Operational Updates | 7 | DFO | 15 Minutes |
| *11:30AM to 12:15AM* | 10 | Science Update | 8 | DFO | 45 Minutes |
| *12:15AM to 1:30PM* | | **LUNCH BREAK** | | | 1 Hour 15 Minutes |
| | | **Environment Canada (EC): Issues/Decisions** | | | |
| *1:30PM to 2:00PM* | 11 | Downlisting of Peary Caribou under the Species At Risk Act | 9 | ECCC-CWS | 30 Minutes |
| *2:00PM to 2:20PM* | 12 | Pre-listing consultations for Caribou (Torngat Mountains Population) as Endangered under the federal Species at Risk Act | 10 | ECCC-CWS | 20 Minutes |

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|---|---|---|---|---|---|
| *2:20PM to 2:40PM* | 13 | Pre-listing consultations for the Transverse Lady Beetle as a species of Special Concern under the federal Species at Risk Act | 11 | ECCC-CWS | 20 Minutes |
| | | | | | |
| *2:40PM to 3:10PM* | 14 | Pre-listing consultations for the Barren-ground Caribou as Threatened under the federal Species at Risk Act | 12 | ECCC-CWS | 30 Minutes |
| | | | | | |
| | | **Parks Canada Agency: Issues/Decisions** | | | |
| | | | | | |
| *3:10PM to 3:40PM* | 15 | Ukkusiksalik Management Plan | 13 | PCA | 30 Minutes |
| | | | | | |
| *3:40PM to 3:55PM* | | ***BREAK*** | | | 15 Minutes |
| | | | | | |
| | | **Nunavut Tunngavik Incorporated (NTI): Issues/Decisions No submissions** | | | |
| | | | | | |
| | | No submissions | N/A | N/A | |
| | | | | | |
| | | **Arctic Fishery Alliance** | | | |
| | | | | | |
| *3:55PM to 4:25PM* | 16 | Allocation Policy for Commercial Marine Fisheries | 14 | AFA | 30 Minutes |
| | | | | | |
| *4:25PM to 4:30PM* | | Adjournment | | Acting Chairperson | 5 Minutes |
| | | | | | |

**SUBMISSION TO THE**

**NUNAVUT WILDLIFE MANAGEMENT BOARD**

**FOR**

**Information:** **Decision: X**

**Issue:** There is no set number of allowable outfitter-led sport hunts for caribou herds where there is no set Total Allowable Harvest (TAH) or a current sport hunt recommendation.

**Background:**

- Current Wildlife Regulations state that sport hunters (defined here as Non-resident and Non-resident foreigner hunters) have an annual harvesting limit of 2 caribou per hunter, but there is no limitation on the number of sport hunters that can harvest this limit.
- The Government of Northwest Territories had historically set limitations for sport hunts by Barren-ground caribou management units. Under the current Nunavut legislation, barren-ground caribou are managed by herd, not management unit.

**Current Status:**

- Sport hunting is an activity that provides economic benefits to communities through outfitting and the Department of Environment (DOE) supports the continuation of sport hunting but there needs to be a limitation on this activity to ensure sport hunting does not cause further declines of caribou populations and impact subsistence hunting.
- Processes have been started to establish a TAH on some caribou herds that do not currently have them. Once a TAH is established, HTOs have the ability to designate a portion of their available tags to outfitters for sport hunting.
- As an interim approach to community concerns regarding the potential impacts of sport hunting on these herds, the DOE consulted with Hunters and Trappers Organizations (HTOs) to determine an acceptable number of sport hunting tags for caribou herds for which no TAH has been established (Appendix 1; Caribou Sport Hunting Consultation Summary).

- All HTOs commented that they would like the ability to revisit the quota should there be changes to the population estimates of herds or changes to community needs.

Kivalliq community recommendations

| Community | Date of Consultation | In Favor of Sport Hunting | Recommended Number of Sport Hunt Tags |
|---|---|---|---|
| Arviat | May 4, 2017 | Yes | 100 sport hunts for Arviat |
| Baker Lake | May 4, 2017 | Does not support sport hunting near Baker Lake | 0 |
| Chesterfield Inlet | June 27, 2017 | Yes | 10 sport hunts for Chesterfield Inlet (5 from Qamanirjuaq/Beverly and 5 from Lorillard/Wager Bay |
| Coral Harbour | May 8, 2017 | Yes | 40 sport hunts from Coates Island for Coral Harbour |
| Naujaat | May 3, 2017 | Yes | 60 sport hunts for Naujaat |
| Rankin Inlet | No HTO meetings for several months | N/A | N/A |
| Whale Cove | May 17, 2017 | Yes | 40 sport hunts for Whale Cove, 250 sport hunts for the region |

Kitikmeot community recommendations

| Community/HTO | Date of Consultation | In Favor of Sport Hunting | Recommended Number of Sport Hunt Tags |
|---|---|---|---|
| Cambridge Bay | May 11, 2017 | Yes | No sport hunts from Bluenose East or Bathurst herds, 25 sport hunts from Dolphin and Union herd and 100 sport hunts from both Ahiak and Beverly herds |
| Burnside HTO | June 14, 2017 | Yes | 30 sport hunts from Bathurst herd |

| | | | |
|---|---|---|---|
| Omingmaktok HTO | Not available for consultation | Have previously indicated they are in favor of sport hunting | N/A |
| Gjoa Haven | July 20, 2017 | Yes | 20 sport hunts for Gjoa Haven (as long as it does not lead to a TAH being necessary) |
| Kugaaruk | May 17, 2017 | Unsure | Did not provide a recommendation at the time |
| Kugluktuk | June 21, 2017 | No | 0 |
| Taloyoak | May 4, 2017 | Unsure | Did not provide a recommendation at the time |

**Recommendations:**

- The Nunavut Wildlife Management Board set Non-resident and Non-resident foreigner sport hunting limits for caribou herds without a current Total Allowable Harvest as follows:
  - **Qamanirjuaq** caribou herd: **175** sport hunting tags
  - **Beverly** and **Ahiak** caribou herds: **150** sport hunting tags in total
  - **Lorillard** and **Wager Bay** caribou herds: **100** sport hunting tags in total
  - **Coates Island** caribou herd: no current recommendation until new population estimate is available

- The caribou sport hunting limitations can be increased or decreased through the Nunavut Wildlife Management Board process on an as-needed basis to address any conservation issues or changes to community needs that may arise.

- The Nunavut Wildlife Management Board decides the allocation of sport hunting tags between Regional Wildlife Organizations where applicable, for herds that are shared between regions.

## Appendix 1: Caribou Sport Hunt consultation Summary (attached as separate document)

# CONSULTATION SUMMARY FOR CARIBOU SPORT HUNTING LIMITATIONS

3 May, 2017: Arviq HTO, Naujaat

4 May, 2017: Arviat HTO, Arviat

4 May, 2017: Baker Lake HTO, Baker Lake

4 May, 2017: Spence Bay HTO, Taloyoak

8 May, 2017: Aiviit HTO, Coral Harbour

11 May, 2017: Ekaluktutialik HTO, Cambridge Bay

17 May, 2017: Kurtairojuark HTO, Kugaaruk

17 May, 2017: Issatik HTO, Whale Cove

14 June, 2017: Burnside HTO, Cambridge Bay

21 June, 2017: Kugluktuk HTO, Kugluktuk

27 June, 2017: Aqigiq HTO, Chesterfield Inlet

20 July, 2017: Gjoa Haven HTO, Gjoa Haven

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Nunavut

Department of Environment, Government of Nunavut

Iqaluit, NU

Prepared: 14 August, 2017

## Executive Summary

When a Total Allowable Harvest (TAH) is established for a caribou herd, the relevant Hunting and Trapping Organizations (HTOs) are able to assign a portion of the available tags to outfitters for sport hunting. Some of the caribou herds in Nunavut do not have a TAH established and the current Wildlife regulations have a sport hunting limit of 2 caribou set for non-residents, and non-resident foreigner hunters. As a result, there is no set number of allowable sport hunts for the caribou herds where there is no set TAH. A decision from the Nunavut Wildlife Management Board (NWMB) is required in order to establish a sport hunting limitation for herds without a TAH.

Sport hunting is an activity that provides economic benefits to communities and the Department of Environment (DOE) supports the continuation of sport hunting but there needs to be a limitation on this activity to ensure sport hunting does not cause further declines of caribou populations and impact subsistence hunting.

DOE Conservation Officers consulted with as many Hunters and Trappers Organizations as possible during their regular meetings in the Kivalliq and Kitikmeot regions of Nunavut between May and July of 2017. The primary purpose of these consultations was to determine sport hunting limitation recommendations from each community to assist the DOE in providing appropriate recommendations to the NWMB for decision.

The recommendations from each of the consulted community HTOs were sent by the attending conservation officers to the two regional wildlife managers who then reported the information back to the Coordinator of Operations and Regulations. The recommendations were compiled and used to form the DOE recommendations for caribou sport hunting limitations.

## 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 the Kitikmeot and Kivalliq regions.

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

## Table of Contents

## 1.0 Report Purpose and Structure

This report is intended to: 1) provide the details of why and how DOE consulted with various Hunting and Trapping Organizations (HTOs) in the Kivalliq and Kitikmeot regions to discuss caribou sport hunting limitations and community recommendations and 2) collate and summarize recommendations provided by the HTOs. The following community HTOs were consulted between May and July 2017:

- 3 May, 2017: Arviq HTO, Naujaat
- 4 May, 2017: Arviat HTO, Arviat
- 4 May, 2017: Baker Lake HTO, Baker Lake
- 4 May, 2017: Spence Bay HTO, Taloyoak
- 8 May, 2017: Aiviit HTO, Coral Harbour
- 11 May, 2017: Ekaluktutialik HTO, Cambridge Bay
- 17 May, 2017: Kurtairojuark HTO, Kugaaruk
- 17 May, 2017: Issatik HTO, Whale Cove
- 14 June, 2017: Burnside HTO, Cambridge Bay
- 21 June, 2017: Kugluktuk HTO, Kugluktuk
- 27 June, 2017: Aqigiq HTO, Chesterfield Inlet
- 20 July, 2017: Gjoa Haven HTO, Gjoa Haven

After these consultations, the DOE will provide a submission to the NWMB for decision that includes a recommendation on sport hunting limitations.

## 2.0 Purpose of Consultations

The purpose of these consultations was to discuss caribou sport hunting limitations for herds found in Nunavut without a set TAH. Each community consulted was asked to provide a recommendation that reflects how their community values caribou sport hunting. After the consultations, the DOE will submit caribou sport hunt limitation recommendations herds without a TAH to the NWMB for decision. This decision will aim to reduce the potential for overharvest due to caribou sport hunting.

### *2.1 Format of Meetings*

Conservation officers (COs), in each of the Kivalliq and Kitikmeot communities, were instructed to attend their local HTO regular meeting to discuss sport hunting limitations. The meetings were held in the evenings and the CO-led consultation was part of the regular agenda. The CO asked each HTO how many tags they would like to see being made available for sport hunts since there are no current TAH for some herds.

The following questions were asked at each consultation:

- Does the HTO want to see a limit placed on the number of caribou (from herds that have no TAH) harvested in their areas by sport hunters? HTO must identify a limit by herd.
- If so, what does the HTO consider to be a reasonable number of caribou to be made available for sport hunting?
- Does the HTO have any concerns surrounding the sport hunting of caribou?

## 3.0 Summary by Community

### *3.1 Arviat Consultation Summary*

**Date**: 4 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Joe Savikataaq Jr.
- Arviat HTO: Thomas Alikaswa
- Arviat HTO: Dicky Hapanaq
- Arviat HTO: Gordy Kidlapik
- Arviat HTO: Sam Garry Muckpa

**Comments and questions:**

In response to questions asked by Officer Savikataaq regarding the sport hunting of caribou, the HTO members present were in support of having caribou sport hunts continue. The recommended amount was 100 caribou sport hunts for Arviat but there were no comments regarding other communities in the region.

### *3.2 Baker Lake Consultation Summary*

**Date**: 4 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Russell Toolooktook
- Baker LakeHTO Members

**Comments and questions:**

The Baker Lake HTO does not support sport hunts for residents (non-beneficiary) or non-residents near Baker Lake.

### 3.3 Burnside HTO Consultation Summary

**Date**: 14 June, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Candice Sudlovenick
- Burnside HTO memebers

**Comments and questions:**

The Burnside HTO recommended 30 caribou from the Bathurst herd be provided for sport hunting for their community. No recommendation for other communities or the herd overall.

### 3.4 Cambridge Bay Consultation Summary

**Date**: 11 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Shane Sather
- Ekaluktutialik HTO Members

**Comments and questions:**

The Ekaluktutialik HTO did not support any sport hunts from Bluenose East of Bathurst herds. They recommended 25 sport hunts from Dolphin and Union herd and 100 sport hunts from both the Ahiak and Beverly herds.

### 3.5 Chesterfield Inlet Consultation Summary

**Date**: 27 June, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Peter Kattegatsiak Sr.
- Aqigiq HTO Members

**Comments and questions:**

The HTO recommendation was for 10 caribou sport hunts for Chesterfield Inlet (5 from Qamanirjuaq/Beverly herds and 5 from Lorillard/Wager Bay herds). There was no recommendation for other communities or herds.

### *3.6 Coral Harbour Consultation Summary*

**Date**: 8 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Peter Kattegatsiak Sr.
- Aiviit HTO Members

**Comments and questions:**

The Aiviit HTO recommended 40 caribou for sport hunting from Coates Island.

### *3.7 Gjoa Haven Consultation Summary*

**Date**: 27 June, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Peter Aqqaq
- Gjoa Haven HTO Members

**Comments and questions:**

There are currently no outfitters operating in Gjoa Haven, but the HTO recommended a sport hunt limit of 20 caribou. If this leads to herds around Gjoa haven eventually needing a TAH they would prefer to have no sport hunts.

### *3.8 Kugaaruk Consultation Summary*

**Date**: 17 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Chad Bruneski
- Kurtairojuark HTO Members

**Comments and questions:**

The Kurtairojuark HTO members were unsure of the numbers of caribou in their area so were unable to make a recommendation at the time of the consultation.

### *3.9 Kugluktuk Consultation Summary*

**Date**: 21 June, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Allen Niptanatiak
- Kugluktuk HTO Members

**Comments and questions:**

The Kugluktuk HTO does not support sport hunts for caribou.

### *3.10 Naujaat Consultation Summary*

**Date**: 3 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: Peterloosie Papatsie.
- Arviq HTO Members

**Comments and questions:**

The Arviq HTO recommended 60 caribou sport hunts for Naujaat from the Wager Bay herd.

### *3.11 Omingmaktok HTO Consultation Summary*

**Date**: N/A

**Representatives:** N/A

**Comments and questions:**

The Omingmaktok HTO supports caribou sport hunts but did not provide a recommended number.

### *3.12 Rankin Inlet Consultation Summary*

**Date**: N/A

**Representatives:** N/A

**Comments and questions:**

There were no HTO board members present in Rankin Inlet available for a meeting when requested. HTO has not had meetings for an extended period of time.

### 3.13 Taloyoak Consultation Summary

**Date**: 4 May, 2017

**Representatives:**

- GN-DOE, Conservation Officer: David Anavilok
- Spence Bay HTO Member: Sam Tulurialik
- Spence Bay HTO Member: George Aklah
- Spence Bay HTO Member: Bruce Takolik

**Comments and questions:**

The Taloyoak HTO members were unsure of the numbers of caribou in their area so were unable to make a recommendation at the time of the consultation.

### 3.14 Whale Cove Consultation Summary

**Date**: 17 May, 2017

**Representatives:**

- GN-DOE, Regional Manager: Rob Harmer
- Issatik HTO Members

**Comments and questions:**

The Issatik HTO recommended 40 caribou sport hunt tags for Whale Cove and 250 for the region.

## 4.0 Summary

All but two HTOs within the Kivalliq and Kitikmeot regions were available for consultation between May and July of 2017. The communities that were consulted expressed whether or not they were in favour of caribou sport hunting around their community and most provided a recommendation for the number of sport hunting tags in their community. Based on the feedback from the communities, the DOE will provide recommendations by caribou herd, or combined herds, to the NWMB for decision. The suggestion that caribou sport hunting limitations can be increased or decreased through the NWMB process on an as needed basis will be included in the DOE recommendations to address any conservations issues or changes to community needs that may arise.

**SUBMISSION TO THE**

**NUNAVUT WILDLIFE MANAGEMENT BOARD**

**FOR**

**Information: X** **Decision:**

**Issue: Information on the progress of the community-based management plan for Bathurst caribou in Nunavut**

## Background

- In June 2015, the Bathurst caribou population was estimated at 19,700 animals, which was significantly lower than the 2012 population estimate of 35,000 caribou. The 2015 estimate was 37% lower than the 2012 estimate based on the adult female-based estimate, representing an annual decline of 14%.
- Barren-ground caribou, such as the Bathurst herd, was assessed as Threatened in 2016 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Appendix I).
- With this recent assessment by COSEWIC, there is a strong emphasis on developing a management plan for the Bathurst caribou herd.
- In May 2017, based on the Nunavut Wildlife Management Board decision, the GN Minister of Environment implemented a Total Allowable Harvest (TAH) of thirty (30) male only caribou for the Bathurst herd and supported the development of a community-based management plan referred to as the "*Integrated Community Caribou Management Plan*" (ICCMP) (attachment 1).

## Current Status

- The Government of Nunavut, Department of Environment, continues to offer its assistance in working closely with affected Hunters and Trappers Organizations (HTOs) and the Regional Wildlife Organization (RWO) to further develop their draft ICCMP for the Bathurst herd.
- In July 2017, The Department of Environment sent a letter to the respective HTOs to offer technical support and resource assistance towards the development of the ICCMP for the Bathurst herd (attachment 2).
- The Department continues to engage and work closely with affected communities and respective co-management partners (HTOs, Kitikmeot Regional Wildlife Board, and Nunavut Tunngavik Inc.) on caribou management needs.
- Interjurisdictional meetings were recently held with larger affected users (Government of the Northwest Territories (GNWT), GNWT Indigenous leaders, Government of Nunavut, Nunavut Tunngavik Inc., others) to discuss development of

an interjurisdictional Bathurst Caribou Management Plan and Bathurst Caribou Range Plan.

- Affected Nunavut HTOs of Cambridge Bay, Bathurst Inlet, and Kugluktuk did not attend the interjurisdictional meeting.

## Next Steps

- In early December, 2017, the Department will forward for review and comments interjurisdictional progress to date on a framework for the interjurisdictional Bathurst Caribou Management Plan, for Nunavut HTOs and RWO input and feedback.
- The Department is planning to meet with affected HTOs and RWO in mid-January 2018 to discuss the development of the *Integrated Community Caribou Management Plan (*ICCMP*)* for the Bathurst herd.

## Recommendation

- N/A

Attachment 1

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

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Minister of Environment
Ministaat Avatiliqiyitkut
Ministre de l'Environnement

May 22, 2017

Joe Ashevak
Chairperson
Kitikmeot Regional Wildlife Board
P.O. Box 104, Kugaaruk, NU X0B 1K0

Larry Adjun
Chairperson
Kugluktuk Angoniatit Association
P.O. Box 309, Kugluktuk, NU, X0B 0E0

Connie Kapolak
Chairperson
Burnside Hunters and Trappers Organization
P.O. Box 119
Cambridge Bay, NU X0B 0C0

Peter Kapolak
Chairperson
Omingmaktok HTO
NIWS Rankin Inlet
PO Box 219, Rankin Inlet, NU, X0C 0G0

Bobby Greenley
Chairperson
Ekaluktutiak Hunters and Trappers Organization
P.O. Box 1270
Cambridge Bay, NU X0B 0C0

Dear Co-Management Partners,

**Re: New regulations concerning the Bathurst Caribou herd harvest management.**

Following a review of the Nunavut Wildlife Management Board's decision, consultation with partners, and recognizing the current status of the Bathurst Caribou herd, the Government of Nunavut has established a TAH of thirty (30) male only caribou for the Bathurst caribou herd. The Government also supports the various initiatives aimed at the development of the Bathurst Caribou Management Plan.

The total allowable harvest (TAH) for the Bathurst caribou herd will be effective as of July 1, 2017. The Kitikmeot Regional Wildlife Board will allocate this TAH among the affected Hunters and Trappers Organizations and advise the Department of Environment of their decision on or before June 15, 2017. This will facilitate the distribution of the appropriate number of tags to each HTO having a share of the Bathurst Caribou TAH.

My Department's regional staff and local Conservation Officers will work with co-management partners, particularly the Burnside Hunters and Trappers Association and the Kugluktuk Angoniatit

Minister of Environment
Ministaat Avatiliqiyitkut
Ministre de l'Environnement

Association, to prepare for the implementation and management of this TAH. This will include: the management of the tags, the harvest reporting system, and sample collection.

My staff will also be available to provide technical and field support for the development of any necessary Regional Wildlife Organization (RWO) or HTO rules related to the management of tags and non-quota limitations such as harvest area restrictions and seasonal harvest restrictions that the RWO or HTOs may want to put in place.

Further, my Department will be happy to assist HTOs to finalize their Integrated Community Caribou Management Plan (ICCMP) for the conservation of the Bathurst caribou herd. It would be useful to have this ICCMP finalized by Fall 2017 to align with the territorial and inter-jurisdictional initiatives related to the management of this herd.

On-going communication, meetings, and the recent NWMB public hearing have shown that we all share concerns regarding the declining rate of the Bathurst Caribou herd. I hope that our collaborative work will continue in implementing this TAH and other management actions needed to foster the recovery of this caribou herd.

Best Regards,

for Sam Kotens

Joe Savikataaq
Minister

C.C. Daniel Shewchuk, Acting Chairperson, Nunavut Wildlife Management Board;
Paul Irngaut, Director of Wildlife and Environment, Nunavut Tunngavik Incorporated;
Lynda Yonge, Director of Wildlife Division, Government of Northwest Territories
Drikus Gissling, Wildlife Director, Government of Nunavut

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Ministauyuq Avatiliqiyikkutni
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May 22, 2017

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Bobby Greenley
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Haluu, Munaqhiqatigiiktunut Havaqatigiinut,

**Talvuuna: Nutaat maligahat pidjutauyut Qingaup tuktuit anguniaqnikkut munagidjutainun.**

Malikhugu ihivgiuqniq Nunavumi Umayuligiyit Katimayiit ihumaliuqtait, katimaqatigiblugit iligiit, uvalu ilitagiblugit tadjamin qanuginiit hapkua Qingaup tuktuit, Kavamatkut Nunavunmi piliuqtut uuminga TAH 30nik anguhaluinaqnik tuktunik haffumanga tuktuinit. Kavamatkutlu ikayuqhugit aalakiit pinahuagutit tugaaqhimayut havauhigaanun Qingaup tuktuinik Munagidjutighainik Upalungaiyautit.

Attatutimut anguniagahat (TAH) hapkuninga Qingaup tuktuinik atuliqniaqtuq uvani Taaqnirmun Aullaqtirvia 1, 2017. Kitikmeoni Avikturniani Huraanut Katimayiit tuniuhgakniaqtut uuminga TAH tahapkununga pidjutauyunun Anguniaqnikkut Ktimayiinun uvalu uniutilugitlu hapkua Avatiliqiyikkut ihumaliugutimingnik tikitinagu Immaktirvia 15, 2017. Una naunaiyaudjutiniaqtuq tunighainiq ihuaqtumik qaffiuniit haviktait attatutinun HTOtkunun piqaqtut ilauqatigiiknikkut haffumunga Qingaup Tuktuinik TAHngit.

Havakvima aviktuqniitigut havaktut uvalu nunamingni Anguhiqqiyiit havaqatiginiaqtait Munaqhiqatigiiktunut Havaqatigiinut iligiit, hapkualuaq Burnside Anguniaqtit Katimayiit uvalu Kuluktup

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Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble
Nunavut

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Ministauyuq Avatiliqiyikkutni
Ministauyuq Avatiliqiyikkutni
Ministre de l'Environnement

Anguniatit Katimayiit, upalungaiyaqlutik atuliqgutighaanik uvalu munagidjutighaanik haffuma TAH. Una ilauniaqtuq: munagidjutighait haviktait, anguniaqnikkut ukiudjutit auladjutait, uvalu uuktuutinik katitiqhiniq.

Havaktitka hailiniaqtut tunihilutik ayuittiaqnikkut uvalu ahiqpani ikayuutinik haffumunga havaknianun quyaginaq piyaghait Aviktauninganiitunik Anguhiqiyikkut Katimayiit. (RWO) uvaluuniin HTOtkut atugahait pihimayut hapkununga munaginikkut haviktanik uvalu haviktaitunik kiklighainik imaatun anguniaqnikkut humi pittailinikkut uvalu ukiungitigut anguniaqniq anguniaIainiq hapku RWOtkut uvaluuniin HTOtkut piumaniagunaqhiyait iliugaqlugit.

Taimaalu, Havakviga quviahuktut ikayuqlugit HTOtkut iniqtigiagani inmi ilaliutihimayunik Nunalaat Tuktunik Munagidjutinik Upalungaiyautit (ICCMP) haffumunga munagidjutighait hapkua Qingauqmi Tuktut. Ikayuutauniaqtuq una ICCMP iniqtaukpat ukiaghamik 2017 aadjikiigiangani haffumunga aviktughimayuni uvalu iluani nunanginni pinahuagutit ilauyut hapkununga munagidjutait hapkua tuktut.

Aulahimaaqtumik tuhaqtitinikkut, katimadjutit, uvalu nutaaq NWMB inungnun tuhaqtitiniq tautuktitiyut tamapta ilauqaitigiiktugut ihumaaluutinik mighaagun ikilivaliayut qaffiuniit hapkua Qingaup tuktuit. Nigiuktunga uvagut havaqatigiikluta havakupta aulahimaaqniaqtuq atuliqtilugu una TAH uvalu aalat munagidjutit hulidjutit ihagiagiyauyut tiguaqlugu amigaiqtiffaalugit hapkua tuktut.

Nakuuttiaqnikkut,

Joe Savikataaq

Joe Savikataaq
Minista

AADJILIUQHIMAYUQ Daniel Shewchuk, ighivautaliqaffuq, Nunavumi Umayuligiyit Katimayiit;
Paul Irngaut, Aulapkaiyi hapkununga Uumayunik uvalu Avatingni, Nunavut Tunngavik Incorporated;
Lynda Yonge, Aulapkaiyi Uumayuliqiyikkut Havakvia, Kavamatkut Nunatsiaqmi
Drikus Gissling,Uumayuliqiyikkut Aulapkaiyi, Kavamatkut Nunavunmi

ᑲᑐᔾᔨᓗᓯ ᓄᓇᕗᑦ ᐱᔨᑦᑎᕋᖃᑎᒌᓪᓗᑕ
Building Nunavut Together
Nunavuliuqatigiingniq
Bâtir le Nunavut ensemble
ᓄᓇᕗᑦ
Nunavut

ᒥᓂᔅᑕ ᐊᕙᑎᓕᕆᔨᒃᑯᓐᓄᑦ
Minister of Environment
Ministaat Avatiliqiyitkut
Ministre de l'Environement

ᒪᐃ 22, 2017

ᔫ ᐋᓯᕙᒃ
ᐃᓯᕙᐅᑕᖓᑦ
ᖃᑎᖅᒥᐅᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐆᒪᔪᓕᕆᔾᑦ ᑲᑎᒪᔨᖏᑦ
ᑎᑎᖅᑲᓂᐊᕐᕕᐅᓪᒥᑦ ᑎᑎᖅᑲᓂᐊᕐᕕᒃ 104,
ᑰᒑᕐᔪᒃ, ᓄᓇᕗᑦ X0B 1K0

ᑳᓂ ᑲᐳᓚᒃ
ᐃᓯᕙᐅᑕᖓᑦ
ᐹᓐᓚᐃᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔾᑦ
ᑎᑎᖅᑲᓂᐊᕐᕕᐅᓪᒥᑦ ᑎᑎᖅᑳᒃᑯᕕᖓ 119
ᐃᖃᓗᒃᑑᑦᑎᐊᖅ, ᓄᓇᕗᑦ X0B 0C0

ᐹᐱ ᒍᓇᓐᓚ
ᐃᓯᕙᐅᑕᖓᑦ
ᐃᖃᓗᒃᑑᑦᑎᐊᖅ ᐊᖑᓇᓱᒃᑐᓕᕆᔾᑦ
ᑎᑎᖅᑲᓂᐊᕐᕕᐅᓪᒥᑦ ᑎᑎᖅᑳᒃᑯᕕᖓ 1270
ᐃᖃᓗᒃᑑᑦᑎᐊᖅ, ᓄᓇᕗᑦ X0B 0C0
ᐊᐅᓚᑦᑎᔨᐅᖃᑎᒋᓄᑦ ᐱᓕᕆᖃᑕᐅᔪᓄᑦ,

ᓕᐅᓇ ᐋᑦᕗᓐ
ᐃᓯᕙᐅᑕᖓᑦ
ᖁᑦᔪᒃᑐᖅ ᐊᖑᓂᐊᖅᑏᑦ ᑲᑐᔾᔨᖃᑎᒌᖓᑦ
ᑎᑎᖅᑲᓂᐊᕐᕕᐅᓪᒥᑦ ᑎᑎᖅᑲᓂᐊᕐᕕᒃ 104,
ᖁᑦᔪᒃᑐᖅ, ᓄᓇᕗᑦ X0B 0E0

ᐲᑕ ᑲᐳᓚᒃ
ᐃᓯᕙᐅᑕᖓᑦ
ᐅᒥᖕᒪᒃᑑᖅ ᐊᖑᓇᓱᒃᑐᓕᕆᔾᑦ
ᓄᓇᕗᒻᒥ ᐆᒪᔪᓕᕆᔾᑦ ᐊᓪᓚᕕᖓ ᑲᖏᖅᖢᑎᓐᓂᖅ
ᑎᑎᖅᑳᒃᑯᕕᒃ 219, ᑲᖏᖅᖢᑎᓐᓂᖅ, ᓄᓇᕗᑦ X0C 0G0

ᐱᔾᔪᑖ: ᓄᑖᑦ ᒪᓕᒐᐃᑦ ᕿᓚᒃᑯᑦ ᑐᒃᑐᓕᕆᓂᕐᒥᑦ ᓂᕿᖃᖅᓯᐅᖅᑕᐅᕙᒃᑐᑦ ᐊᐅᓚᑕᐅᓂᖏᑦ ᐱᔾᔪᑎᒋᓗᒋᑦ.

ᖃᐃᖅᑯᓚᐅᖅᑎᓪᓗᒋᑦ ᓄᓇᕗᒥ ᐆᒪᔪᓕᕆᔾᑦ ᑲᑎᒪᔨᖏᑕ ᐃᓱᒪᓕᐅᕈᑎᖓᓂᒃ, ᐱᓕᕆᖃᑕᐅᔪᑦ ᐅᖃᖅᑎᒋᓪᓗᒋᑦ ᐊᒻᒪ ᕿᓚᒃᑯᑦ ᑐᒃᑐᓕᕆᓂᕐᒥᑦ ᖃᓄᐃᓕᖓᓕᕐᓂᖏᑦ ᖃᐅᔨᓪᓗᒋᑦ, ᓄᓇᕗᑦ ᒐᕙᒪᒃᑯᑦ ᐊᖏᖃᑦᓯᓚᐅᖅᐳᑦ ᑲᑎᖕᓗᒋᑦ ᐊᖑᔭᐅᔪᓐᓇᖅᑐᑦ 30-ᖑᕆᓐᓇᖅᓯᓕᑎᒃ ᐊᖑᔮᓗᐃᓐᓇᕐᓂᒃ ᕿᓚᒃᑯᑦ ᑐᒃᑐᕐᒥᑦ ᑐᒃᑐᖏᓐᓂ. ᒐᕙᒪᒃᑯᑦᑕ ᐃᑲᔪᖅᑐᐃᒋᐊᖅ ᐊᕐᕌᒍᒥᑦᑐᓂ ᐱᒋᐊᖅᑎᑕᐅᔪᓂ ᑐᕌᒐᖅᑐᓂ ᕿᓚᒃᑯᑦ ᑐᒃᑐᖏᓐᓂ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᓕᐅᖅᑕᐅᕙᓪᓕᐊᔪᒥᑦ.

ᑲᑎᖕᓗᒋᑦ ᐊᖑᔭᐅᔪᓐᓇᖅᑐᑦ ᕿᓚᒃᑯᑦ ᑐᒃᑐᖏᓐᓂ ᐊᑐᓯᒋᐊᕐᓂᐊᖅᐳᖅ ᔪᓚᐃ 1, 2017-ᒥ. ᖃᑎᖅᒥᐅᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐆᒪᔪᓕᕆᔾᑦ ᑲᑎᒪᔨᖏᑦ ᑲᑎᖕᓗᒋᑦ ᐊᖑᔭᐅᔪᓐᓇᖅᑐᓂ ᑐᓂᐅᖅᑲᐃᓂᐊᖅᐳᑦ ᐊᑐᖅᑕᐅᓯᒪᔪᓄᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᓄᑦ ᐊᒻᒪ ᐊᕙᑎᓕᕆᔨᒃᑯᑦ ᐃᓱᒪᓕᐅᕆᓂᕐᑯᔭᐅᓗᑎᒃ ᔫᓂ 15-ᒥ ᑐᓴᓂᖓᓂᑦ 2017. ᑖᓐᓇ ᐋᖅᑭᐅᒪᑎᑦᑎᓂᐊᖅᐳᖅ ᑐᓂᐅᖅᑲᐃᓕᖅᐸᑕ ᓈᒻᒪᒃᑐᓂ ᓂᕈᐊᖅᑕᐅᓂ ᐊᑐᓂ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᓄᑦ ᑲᑐᔾᔨᓗᑎᒃ ᕿᓚᒃᑯᑦ ᑐᒃᑐᖏᓐᓂ ᐊᖑᔭᐅᔪᓐᓇᖅᑐᓂ.

ᐱᓕᕆᐊᕆᔭᑦᑕ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐃᖅᑲᓇᐃᔭᖅᑎᖏᑦ ᐊᒻᒪ ᓄᓇᓖᑦ ᐆᒪᔪᓂᐊᖅᑎᑦ ᐱᓕᕆᖃᑎᖃᕐᓂᐊᖅᐳᑦ ᐊᐅᓚᑦᑎᔨᐅᖃᑎᒋᓄᑦ ᐱᓕᕆᖃᑕᐅᔪᓂ, ᐱᓗᐊᖅᑐᒥ ᐹᓐᓚᐃᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᖏᓐᓂ ᐊᒻᒪ ᖁᑦᔪᒃᑐᒥ ᐊᖑᓂᐊᖅᑏᑦ ᑲᑐᔾᔨᖃᑎᒌᖏᓐᓂ, ᐱᕙᓕᐊᔪᓗᑎᒃ ᐊᑐᓕᖅᑎᑕᐅᕙᓪᓕᐊᔪᒥᒃ ᐊᒻᒪ ᐊᐅᓚᑕᐅᓂᖓᓄᑦ ᑲᑎᖕᓗᒋᑦ ᐊᖑᔭᐅᔪᓐᓇᖅᑐᒧᑦ. ᐅᑯᐊ ᐱᖃᓯᐅᔾᔨᓂᐊᖅᐳᑦ: ᓂᕈᐊᖅᑕᐅᓂ ᐊᐅᓚᑦᑎᓂᖅ, ᓂᕿᖃᖅᓯᐅᖅᑕᐅᕙᒃᑐᑦ ᐅᓂᒃᑳᓕᐅᕈᑎᖓ, ᐊᒻᒪ ᖃᐅᔨᓴᕐᓂᐅᑉ ᑲᑎᖅᓱᖅᑕᐅᓂᖏᑦ.

ᐃᖅᑲᓇᐃᔭᖅᑎᒃ ᐊᑐᐃᓐᓇᐅᓂᐊᖅᐳᑦ ᐱᓕᕆᔪᑎᓂ ᐊᒻᒪ ᓯᓚᒥ ᐃᑲᔪᖅᑐᐃᔪᑎᓂ ᐱᑕᖃᖅᑎᑦᑎᓗᒋᑦ ᐱᔪᓐᓇᖅᑕᐅᓂ ᐱᕙᓪᓕᐊᑎᑦᑎᓂᕐᒧᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᑦ ᐆᒪᔪᓕᕆᔾᑦ ᑲᑐᔾᔨᖃᑎᒌᓄᑦ ᐅᕙᖓᓂᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔾᑦ ᒪᓕᒐᖏᓐᓂ ᓂᕈᐊᖅᑕᐅᓂ ᐊᐅᓚᑕᐅᓂᖏᓐᓄᑦ ᑐᕌᖓᔪᓂ ᐊᒻᒪ

ᑲᑐᔾᔨᓗᑎᒃ ᓄᓇᕗᑦ ᐱᕙᓪᓕᕈᑎᓕᐅᕐᓗᒍ
Building *Nunavut* Together
*Nunavut*liuqatigiingniq
Bâtir le *Nunavut* ensemble

ᒥᓂᔅᑕ ᐊᕙᑎᓕᕆᔨᒃᑯᓐᓄᑦ
Minister of Environment
Ministaat Avatiliqiyitkut
Ministre de l'Environement

ᑰᑕᖃᕐᓂᕐᒧᑦ ᑭᒡᓕᖅᑲᖅᑎᑕᐅᔪᑦ ᔪᓯᐅ ᓂᕿᑦᓴᖅᓯᐅᖅᐱᐅᕙᒃᑐᑦ ᑭᒡᓕᖅᑲᖅᑎᑕᐅᓪᓗᑎᒃ ᐊᒻᒪ ᐊᕐᓇᒧᑦ ᐃᓗᐊᓂ ᑭᒡᓕᖅᑲᖅᑎᑕᐅᕙᒃᑐᑦ ᐊᕕᒃᑐᖅᓯᒪᔪᓂ ᐆᒪᔪᓕᕆᔨᒃᑯᑦ ᑲᑐᔾᔨᖅᑲᑎᒌᑦ ᐅᖃᐅᓯᖓᓂᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᑦ ᓴᖅᑭᑎᑦᑐᒪᒍᑎᖃᕐᓇᓱᒃᑲᖅᑕᕆᓂᖏᑦ.

ᓯᓚᒃᑲᓂᖅ, ᐱᓕᕆᕝᕕᒋᔭᒃ ᖁᕝᕙᐊᓯᒃᓂᐊᕗᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᓐᓂ ᐃᑲᔪᕆᐊᓕᒃ ᓇᓗᓇᐃᖅᓯᓇᓱᒃᖢᑎᒃ ᐃᓚᓕᐅᔾᔨᓯᒪᔪᓕᒫᑦ ᓄᓇᓕᖕᓂ ᑐᒃᑐᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᒥᒃ ᕿᒪᒃᐳᑦ ᑐᒃᑐᖕᒋᓐᓂᒃ ᓄᐃᕋᐃᓗᐊᖅᑕᐃᓕᒪᓂᕐᒧᑦ. ᐃᑲᔫᑎᖃᓯᐅᑉᐳᖅ ᑖᓐᓇ ᐃᓚᓕᐅᔾᔨᓯᒪᔪᖅ ᓄᓇᓕᖕᓂ ᑐᒃᑐᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑦ ᓇᓗᓇᐃᖅᑕᐅᓇᓱᖕᒪᑕ ᐅᑭᐅᖅᓯᐅᖅ 2017 ᑐᖔᓂ ᐊᕕᒃᑐᖅᓯᒪᓂᓴᖏᑦ ᐊᒻᒪ ᐱᔪᓐᓇᖅᓯᖅᑲᖅᑎᓪᓗᑦ ᐱᓕᕆᐊᖑᑎᑕᐅᔪᓂᒃ ᒪᓕᒃᑐᓂᒃ ᑐᒃᑐᐃᑦ ᐊᐅᓚᑕᐅᓂᖏᓐᓄᑦ ᐊᒃᑐᐊᓂᓕᖕᓂᒃ.

ᑐᓴᐅᒪᖃᑎᖃᕐᓂᖅᑐᑦ, ᑲᑎᒪᑎᑦᑎᑲᑕᒃᑐᑦ, ᐊᒻᒪ ᓄᓇᕗᒻᒥ ᐆᒪᔪᓕᕆᓂᕐᒧᑦ ᑲᑎᒪᔨᖏᓐᓂᒃ ᐃᓄᓕᒫᖕᓂᑦᑎᓐᓄᑦ ᑲᑎᒪᑎᑦᑎᔾᔭᑕᐅᕙᒃᑐᑦ ᑕᑯᑎᑦᑎᓚᐅᕐᒪᑕ ᐊᐃᑉᐱᕆᒥᒃ ᐃᓯᒪᔪᑎᖃᕐᒪᑕ ᓇᓗᓇᐃᖅᓯᒪᓂᖏᓐᓂᒃ ᕿᒪᒃᐳᑦ ᑐᒃᑐᖏᑦ ᐅᓄᕈᓐᓃᖅᐸᓪᓕᐊᔪᑦ ᐱᔪᑎᒋᓪᓗᒋᑦ. ᓂᕆᐅᒃᐳᖓ ᐱᓕᕆᖃᑎᒋᓪᓗᒍ ᐊᑐᓕᖅᑎᑦᑎᕙᓪᓕᐊᓂᐊᕐᓂᖅᑎᓐᓂᒃ ᑖᓯᒥᖓ ᑲᑎᖦᖢᒋᑦ ᐊᖑᓇᓱᒃᑐᓕᕆᔨᒃᑯᓐᓂ ᐊᒻᒪ ᐊᓯᖏᓐᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐱᓕᕆᐊᖑᓇᓱᒃᑐᓂᒃ ᑲᔪᓯᑎᑕᐅᖁᓪᓗᒍ ᑐᒃᑐᖏᓐᓂᒃ ᐅᑎᖅᑎᑦᑎᓇᓱᖕᓂᖅ.

ᑕᐃᒻᒪᐅᒃᓯ,

ᔫ ᓴᕕᒃᑖᖅ
ᒥᓂᔅᑕ

ᐊᐱᕆᓪᓚᒋᑦ ᐱᔭᒃ ᑖᓐᓂᐅ ᓯᐅᑦᔪᒃ, ᐃᔭᕇᑦᑕᓱᐅᑲᐃᓐᓇᖅᑐᖅ, ᓄᓇᕗᒻᒥᑦ ᐆᒪᔪᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓂᑦ;
ᐹᑦ ᐃᕐᖃᐅᑦ, ᐆᒪᔪᓕᕆᔨᒃᑯᑦ ᐊᕙᑎᓕᕆᔨᒃᑯᓐᓄᑦ ᑐᑭᒧᐊᒃᑎᑦᑎᔨᖅ, ᓄᓇᕗᑦ ᑐᓐᖓᕕᒃᑯᑦ;
ᓕᓐᑕ ᔭᔅ, ᐆᒪᔪᓕᕆᔨᒃᑯᑦ ᐱᓕᕆᕝᕕᖓᓄᑦ ᑐᑭᒧᐊᒃᑎᑦᑎᔨ, ᓄᓇᕕᐊ ᒪᓕᒐᒃᑯᖏᑦ
ᑐᓇᒃ ᕿᓯᖅ, ᐆᒪᔪᓕᕆᓂᕐᒧᑦ ᑐᑭᒧᐊᒃᑎᑦᑎᔨ, ᓄᓇᕗᑦ ᒪᓕᒐᖓᑦ

Attachment 2:

ᐃᓄᐃᑦ ᓄᓇᕗᑦ ᐱᕙᓪᓕᐊᑎᑦᑎᓂᖅ
Building *Nunavut* Together
*Nunavut*liuqatigiingniq
Bâtir le *Nunavut* ensemble

Nunavut

ᐊᕙᑎᓕᕆᔨᒃᑯᑦ
Department of Environment
Avatiliqiyikkut
Ministère de l'Environnement

July 27, 2017

Joe Ashevak
Chairperson
Kitikmeot Regional Wildlife Board
P.O. Box 104, Kugaaruk, NU, X0B 1K0

Larry Adjun
Chairperson
Kugluktuk Angoniatit Association
P.O. Box 309, Kugluktuk, NU, X0B 0E0

Connie Kapolak
Chairperson
Burnside Hunters and Trappers Organization
P.O. Box 119, Cambridge Bay, NU, X0B 0C0

Peter Kapolak
Chairperson
Omingmaktok HTO
P.O. Box 219, Rankin Inlet, NU, X0C 0G0

Bobby Greenly
Chairperson
Ekaluktutiak Hunters and Trappers Organization
P.O. Box 1270, Cambridge Bay, NU, X0B 0C0

Dear Co-Management Partners,

**Re: Status of the Integrated Community Caribou Management Plan (ICCMP) for the Bathurst Caribou in the Kitikmeot Region**

The sustainability of Bathurst caribou in Nunavut assures caribou harvest by Inuit for future generations – and this is a shared goal among co-management partners in Nunavut. Following the Nunavut Wildlife Management Board's decision to establish a Total Allowable Harvest of 30 male only caribou for the 2017 harvest year (see Minister Savikataaq's letter attached), the Board identified a community-based management plan, the *"Integrated Community Caribou Management Plan (ICCMP)"* for the Bathurst Caribou in the Kitikmeot Region to be finalized by Fall 2017,. in order to align with other territorial and inter-jurisdictional initiatives related to the management of this herd.

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To this end, the Government of Nunavut, Department of Environment, would like to offer our technical support and resource staff to assist the Hunters and Trappers Organizations and the Kitikmeot Regional Wildlife Board in further developing this community-based management plan - in whatever ways that may be of assistance.

Our Department is looking forward to working together with you on this community-based co-management initiative that will help foster the re-vitalization and sustainability of Bathurst Caribou.

Please feel free to contact me for any further technical assistance and support on these community-based management initiatives. I can be reached at 867-982-7444 at any time, or LLeclerc@gov.nu.ca.

Regards,

Lisa-Marie Leclerc

Lisa-Marie Leclerc
Regional Wildlife Biologist, Kitikmeot
Department of Environment
Government of Nunavut

c.c. L. Orman
M. Dumond

Appendix 1

COSEWIC
Committee on the Status of Endangered Wildlife in Canada

COSEPAC
Comité sur la situation des espèces en péril au Canada

## Caribou, Monarch butterflies: Canada's iconic migrants at grave risk

*OTTAWA, ONTARIO (December 5, 2016).* From Coho Salmon to Caribou to the much-cherished Monarch butterfly, migration is a key component of Canadian biodiversity. Migratory species, migration and movement all figured prominently at the semi-annual Committee on the Status of Endangered Wildlife in Canada (COSEWIC) deliberations on species at risk, held November 27 - December 2nd.

Young Coho Salmon from the Interior Fraser River basin leave the watershed and live much of their adult lives at sea before migrating back to their native rivers to lay eggs. The Committee considered threats in both fresh and salt water, and the wildlife species' status was assessed as having improved from Endangered to Threatened. Despite ongoing active management and some improvements, the situation faced by Interior Fraser River Coho Salmon is still perilous.

Caribou, Barren-ground population © Ann Gunn

Another iconic migratory species considered by COSEWIC was Caribou. Several populations migrate hundreds of kilometres en masse between their calving and wintering grounds every year. Caribou have experienced alarming declines. Both science and Aboriginal Traditional Knowledge indicate unprecedented declines in several herds with some human activities on the landscape being novel, potentially disrupting natural cycles. According to Justina Ray, co-chair of the Terrestrial Mammals Subcommittee, "Caribou are, sadly, very sensitive to human disturbances, and we are disturbing Caribou more and more. These stressors seem to be interacting in complicated ways with rapid warming in the North. Many of the great northern Caribou herds have now fallen to all-time lows, and there is cause for concern that they will not rebound in the same way they have before." COSEWIC considered the status of two such populations for the first time. Both were found to be in trouble: The Caribou Barren-ground population was assessed as Threatened, while the much rarer Torngat Mountain population in far northeastern Canada was assessed at even higher risk - Endangered.

A third migratory species considered by COSEWIC was the Monarch butterfly. These insects fly over 4,000 kilometres south to Mexico in the fall to overwinter. They breed on their return trip, and their great-grandchildren arrive back in Canada in spring. However, the remarkably tiny wintering grounds where Monarchs congregate continue to be chipped away by habitat loss. Monarch butterfly migration is now recognized as a "threatened process" by the International Union for the Conservation of Nature (IUCN). Indeed, it is the only natural process with this unfortunate distinction. COSEWIC assessed the species as Endangered. Jennifer Heron, co-chair of the Arthropods Subcommittee, summed it up: "We need to continue to support the conservation of milkweed caterpillar habitat both here in Canada and along the Monarch's migratory journey, and we need to support continued conservation of critical overwintering areas. Otherwise, Monarch migration may disappear, and Canada may lose this iconic species."

Monarch © Jessica Linton

The Pink-footed Shearwater finds itself in a comparable situation. Breeding on only three small islands off the coast of Chile, many of these birds travel thousands of kilometres north to feed along the coast of British Columbia during our summer months. The species' southern home is under multiple threats from humans and exotic predators, and shearwaters are killed as fishing by-catch throughout its range. This rare bird was re-assessed as Endangered.

Human interference also causes problems for animal movements at smaller, local scales. Dams that stop Westslope Cutthroat Trout from moving between spawning and feeding grounds have contributed to their shrinking distribution in Alberta. This fish's Saskatchewan – Nelson Rivers populations were re-assessed as Threatened. Slow-moving Blanding's Turtles, which can live for 80 years, travel up to three kilometres from nesting beaches and other summer habitats to fewer small freshwater pools where they overwinter, year after year. Vehicles increasingly threaten this rare turtle wherever roads cross the turtles' seasonal routes, and this species was assessed as Endangered in both Nova Scotia and in central Canada.

In contrast to most of the species assessed by COSEWIC, the widely distributed Blue Shark was assessed as Not At Risk in Canada, in part due to ongoing successful management. New satellite tracking data for this renowned long-distance migrant confirmed long-range movements and seasonal migrations between inshore and deeper offshore habitats.

But of the species assessed, Blue Shark was the exception. Many migratory species decline in step with human barriers and habitat changes. The Chair of COSEWIC, Eric Taylor, stated the bottom line: "Disruptions to migratory behavior are associated with the threat of extinction for species all over the world. We will need to continue to change how we use our landscape so that we and wildlife can thrive together. COSEWIC's work assessing Canadian wildlife helps us do that."

## Next meeting

COSEWIC's next scheduled wildlife species assessment meeting will be held in April 2017.

## About COSEWIC

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At its most recent meeting, COSEWIC assessed 40 wildlife species in various COSEWIC risk categories, including 13 Endangered, 6 Threatened, and 11 Special Concern. In addition to these wildlife species that are in COSEWIC risk categories, COSEWIC assessed 6 wildlife species as Not at Risk. An additional 4 were found to be Data Deficient.

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Fisheries and Oceans Canada, and the Canadian Museum of Nature), three Non-government Science Members, and the Co-chairs of the Species Specialist and the Aboriginal Traditional Knowledge Subcommittees.

## Definition of COSEWIC terms and status categories:

**Wildlife Species**: A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.
**Extinct** (X): A wildlife species that no longer exists.

**Extirpated** (XT): A wildlife species that no longer exists in the wild in Canada, but exists elsewhere.
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**Data Deficient** (DD): A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction.
**Species at Risk:** A wildlife species that has been assessed as Extirpated, Endangered, Threatened or Special Concern.

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| **Dr. Eric B. (Rick) Taylor**<br>Chair, COSEWIC<br><br>Department of Zoology<br>University of British Columbia<br>Telephone: 604-822-9152<br>etaylor@zoology.ubc.ca | For general inquiries:<br><br><br>COSEWIC Secretariat<br>Canadian Wildlife Service<br>Environment and Climate Change Canada<br>351 St. Joseph Blvd, 16th floor<br>Gatineau QC K1A 0H3<br>Telephone: 819-938-4125<br>Fax: 819-938-3984<br>ec.cosepac-cosewic.ec@canada.ca<br>www.cosewic.gc.ca |
| For inquiries on Amphibians and Reptiles (Blanding's Turtle, Western Painted Turtle):<br><br>**Dr. Kristiina Ovaska**<br>Biolinx Environmental Research Ltd.<br>Telephone: 250-727-9708<br>ke.ovaska@gmail.com | For inquiries on arthropods (Gold-edged Gem, Magdalen Islands Grasshopper, Monarch, Sonora Skipper, Transverse Lady Beetle):<br><br>**Jennifer M. Heron**<br>BC Ministry of Environment<br>Telephone: 604-828-2542<br>jenniferheron@gmail.com |
| For inquiries on birds (Evening Grosbeak, Pink-footed Shearwater, Prothonotary Warbler):<br><br>**Dr. Marcel Gahbauer**<br>Stantec<br>Telephone: 613-784-2216<br>marcel@migrationresearch.org | For inquiries on freshwater fishes (Channel Darter, Pygmy Whitefish, Speckled Dace, Westslope Cutthroat Trout):<br><br>**Dr. John R. Post**<br>University of Calgary<br>Telephone: 403-220-6937<br>jrpost@ucalgary.ca |

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| For inquiries on marine fishes (Blue Shark, Coho Salmon - Interior Fraser population):<br><br>**Alan F. Sinclair**<br>Telephone: 250-714-5690<br>alanfsinclair@me.com | For inquiries on marine mammals:<br><br>**Dr. Hal Whitehead**<br>Dalhousie University<br>Telephone: 902-494-3723<br>hal.whitehead@dal.ca |
| For inquiries on terrestrial mammals (Caribou, Nuttall's Cottontail *nuttallii* subspecies):<br><br>**Dr. Justina C. Ray**<br>Wildlife Conservation Society Canada<br>Telephone: 419-850-9038 x22<br>jray@wcs.org | For inquiries on molluscs (Mapleleaf):<br><br>**Dr. Dwayne Lepitzki**<br>Banff, Alberta<br>Telephone: 403-762-0864<br>lepitzki@telusplanet.net |
| For inquiries mosses and lichens:<br>(Nugget Moss, Golden-eye Lichen, Seaside Centipede Lichen)<br><br>**Dr. David H. S. Richardson**<br>Saint Mary's University<br>Telephone: 902-496-8174<br>david.richardson@smu.ca | For inquiries on plants:<br>(American Hart's-tongue Fern, Leiberg's Fleabane, Western Prairie Fringed Orchid)<br><br>**Del Meidinger**<br>Meidinger Ecological Consultants Ltd.<br>Telephone: 250-881-1180<br>Cell phone: 778-977-1180<br>delmeidinger@gmail.com |
| For inquiries on Aboriginal Traditional Knowledge:<br><br>**Dr. Donna Hurlburt**<br>Telephone: 902-532-1341<br>donna.hurlburt@eastlink.ca | |

Further details on all wildlife species assessed can be found on the COSEWIC website at: www.cosewic.gc.ca

**SUBMISSION TO THE**

**NUNAVUT WILDLIFE MANAGEMENT BOARD**

**FOR**

**Information: X** **Decision:**

**Issue: Information on progress of the community-based management plan for Bluenose-East caribou in Nunavut**

## Background

- In June 2015, the Bluenose-East caribou population was estimated at 38,592 animals, which was significantly lower than the 2013 population estimate of 68,000 caribou, representing an annual decline of 21%.
- Barren-ground caribou, such as the Bluenose-East herd, were assessed as Threatened in 2016 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (Appendix I).
- With the recent assessment by COSEWIC, there is a strong emphasis on developing a management plan for the Bluenose-East herd.
- In December 2016, based on the Nunavut Wildlife Management Board decision, the GN Minister of Environment implemented a Total Allowable Harvest (TAH) of 340 caribou for the Bluenose-East herd and supported the development of a community-based management plan referred to as the "*Integrated Community Caribou Management Plan*" (ICCMP) (attachment 1).

## Current Status

- The Government of Nunavut, Department of Environment, continues to offer its assistance in working closely with affected Hunters and Trappers Organizations (HTOs) and the Regional Wildlife Organization (RWO) to further develop their draft ICCMP for the Bluenose-East herd.
- On June 2016, during the NWMB Public Hearing, the Kugluktuk HTO presented a draft of the ICCMP for the Bluenose-East herd.
- On July 2017, The Department of Environment sent a letter to the respective HTOs to offer technical support and resource assistance towards the further development of the ICCMP for the Bluenose-East herd (attachment 2).
- The Department continues to engage and work closely with affected communities and respective co-management partners (HTOs, Kitikmeot Regional Wildlife Board, and Nunavut Tunngavik Inc.) on management needs.

## Recommendation

- N/A

Attachment 1

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Building Nunavut Together
Nunavutliuqatigiingniq
Bâtir le Nunavut ensemble

Nunavut

December 14th, 2016

Larry Adjun
Chairperson
Kugluktuk Angoniatit Association
P.O. Box 309
Kugluktuk, NU X0B 0E0

Simon Qingnaqtuq
Chairperson
Kitikmeot Regional Wildlife Board
P.O. Box 309
Kugluktuk, NU X0B 0E0

Dear Co-Management Partners,

**Re: Nunavut Wildlife Management Board's decisions concerning Bluenose-East harvest management.**

The Government of Nunavut received and has accepted the Nunavut Wildlife Management Board's (NWMB) decision to "*Establish an interim total allowable harvest of three hundred and forty (340) Bluenose East caribou in the Nunavut Settlement Area until such time as either (i) circumstances require a revision to that number, or (ii) the integrated Community Caribou Management Plan for the Bluenose East caribou in the Kitikmeot Region (Bluenose East Caribou Management Plan) is approved and implemented pursuant to Nunavut Land Claims Agreement Sections 5.2.34 (d)(i) and 5.3.7 to 5.3.15*"

The total allowable harvest (TAH) of 340 on the Bluenose East Caribou herd will be enacted as soon as the regulations have been updated, likely by the end of January 2017. In the meantime, my Department's regional staff and local Conservation Officers will work with co-management partners particularly the Kugluktuk Angoniatit Association to prepare for the implementation and management of this TAH, aspects of which will include: the management of the tags, the harvest reporting, and sample collection.

Please note that the NWMB did not make a decision on sex selective harvest, but recommended that the Kitikmeot Regional Wildlife Board (KRWB) promptly establish the prescribed harvest sex-ratio for the Bluenose East Caribou herd. Therefore, it is recommended that the KRWB or Hunters and Trappers Organization (HTO) establish bylaws to address the sex selectivity of the harvest. My staff will be available to provide technical and field support for the development of any necessary RWO or HTO rules related to the management of tags and non-quota limitations such as: harvest area restrictions, seasonal harvest restrictions, and/or sex-selectivity of the harvest.

Further my Department will be happy to assist Kugluktuk Angoniatit Association to finalize its "Integrated Community Caribou Management Plan (ICCMP) for the conservation of the Bluenose East Caribou herd". It would be amicable to have this ICCMP finalized by the end of September 2017, as this would be aligned with the territorial and inter-jurisdictional initiatives related to the management of this herd.

On-going communication, meetings, and the recent NWMB public hearing have shown that we all share concerns regarding the declining rate of the Bluenose East caribou herd. I hope that our collaborative work will continue in implementing this TAH and other management actions needed to foster the recovery of this caribou herd.

Best Regards,

Joe Savikataaq

Joe Savikataaq
Minister

C.c. Daniel Shewchuk, Acting Chairperson, Nunavut Wildlife Management Board;
Paul Irngaut, Director of Wildlife and Environment, Nunavut Tunngavik Incorporated;
Lynda Yonge, Director of Wildlife Division, Government of Northwest Territories

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The sustainability of Bluenose East caribou in Nunavut assures caribou harvest by Inuit for future generations - and this is a shared goal among co-management partners in Nunavut. Following the Nunavut Wildlife Management Board's decision to establish a Total Allowable Harvest of 340 Bluenose East caribou for the 2017 harvest year (see Minister Savikataaq's letter, attached), the Board identified a community-based management plan, the *"Integrated Community Caribou Management Plan (ICCMP)"* for the Bluenose East Caribou in the Kitikmeot Region to be finalized by September 30, 2017, in order to align with other territorial and inter-jurisdictional initiatives related to the management of this herd.

To this end, the Government of Nunavut, Department of Environment, would like to offer our technical support and resource staff to assist the Kugluktuk Angoniatit Association and the Kitikmeot Regional Wildlife Board in further developing this community-based management plan - in whatever ways that may be of assistance. We would also like to follow up on any further sex selectivity harvest discussions that the KRWB and Kugluktuk Angoniatit Association may determine would be helpful.

Our Department is looking forward to working together with you on this community-based co-management initiative that will help foster the re-vitalization and sustainability of Bluenose East Caribou.

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Caribou, Barren-ground population © Ann Gunn

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Monarch © Jessica Linton

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| **Dr. Eric B. (Rick) Taylor**<br>Chair, COSEWIC<br><br>Department of Zoology<br>University of British Columbia<br>Telephone: 604-822-9152<br>etaylor@zoology.ubc.ca | For general inquiries:<br><br>COSEWIC Secretariat<br>Canadian Wildlife Service<br>Environment and Climate Change Canada<br>351 St. Joseph Blvd, 16th floor<br>Gatineau QC K1A 0H3<br>Telephone: 819-938-4125<br>Fax: 819-938-3984<br>ec.cosepac-cosewic.ec@canada.ca<br>www.cosewic.gc.ca |
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|---|---|
| For inquiries on marine fishes (Blue Shark, Coho Salmon - Interior Fraser population):<br><br>**Alan F. Sinclair**<br>Telephone: 250-714-5690<br>alanfsinclair@me.com | For inquiries on marine mammals:<br><br>**Dr. Hal Whitehead**<br>Dalhousie University<br>Telephone: 902-494-3723<br>hal.whitehead@dal.ca |
| For inquiries on terrestrial mammals (Caribou, Nuttall's Cottontail *nuttallii* subspecies):<br><br>**Dr. Justina C. Ray**<br>Wildlife Conservation Society Canada<br>Telephone: 419-850-9038 x22<br>jray@wcs.org | For inquiries on molluscs (Mapleleaf):<br><br>**Dr. Dwayne Lepitzki**<br>Banff, Alberta<br>Telephone: 403-762-0864<br>lepitzki@telusplanet.net |
| For inquiries mosses and lichens:<br>(Nugget Moss, Golden-eye Lichen, Seaside Centipede Lichen)<br><br>**Dr. David H. S. Richardson**<br>Saint Mary's University<br>Telephone: 902-496-8174<br>david.richardson@smu.ca | For inquiries on plants:<br>(American Hart's-tongue Fern, Leiberg's Fleabane, Western Prairie Fringed Orchid)<br><br>**Del Meidinger**<br>Meidinger Ecological Consultants Ltd.<br>Telephone: 250-881-1180<br>Cell phone: 778-977-1180<br>delmeidinger@gmail.com |
| For inquiries on Aboriginal Traditional Knowledge:<br><br>**Dr. Donna Hurlburt**<br>Telephone: 902-532-1341<br>donna.hurlburt@eastlink.ca | |

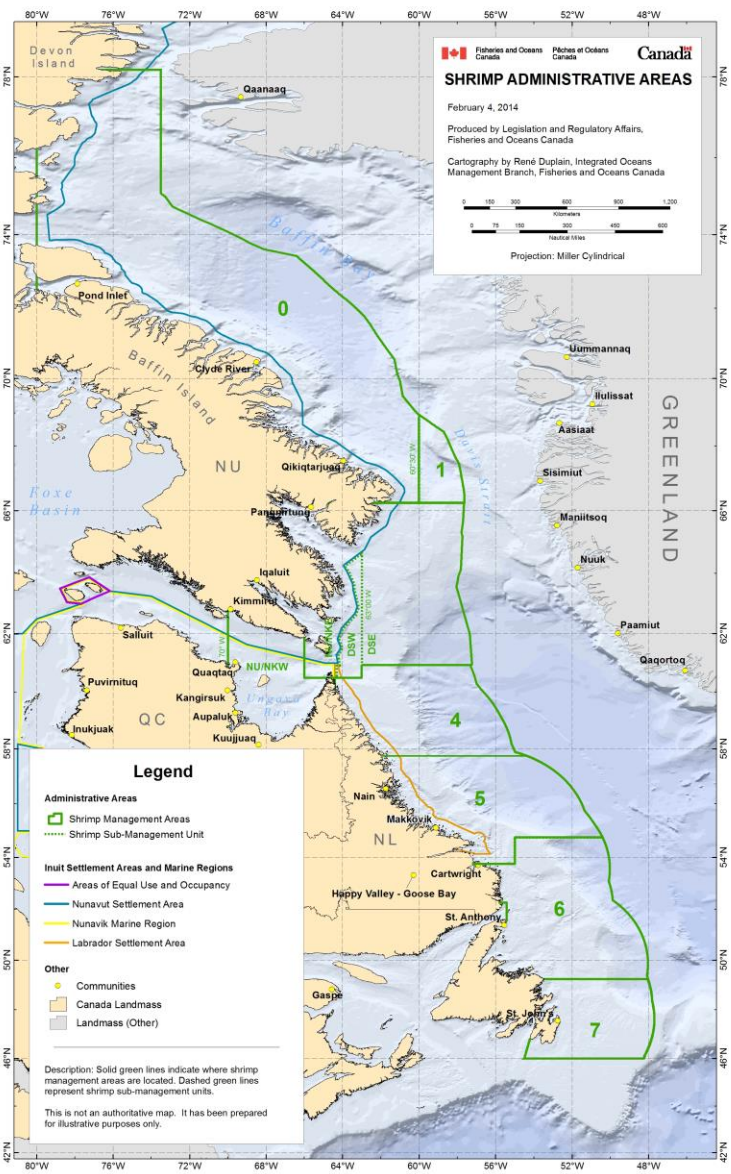
Further details on all wildlife species assessed can be found on the COSEWIC website at: www.cosewic.gc.ca

**SUBMISSION TO THE**
**NUNAVUT WILDLIFE MANAGEMENT BOARD FOR:**

**Information:** **Approval: X**

**Issue: Approval of the 2017 Integrated Fisheries Management Plan for Northern and Striped Shrimp (effective as of the 2018 fishery)**

*Map*




*Background*

The 2017 Integrated Fisheries Management Plan (IFMP) for Northern and Striped Shrimp in Shrimp Fishing Areas (SFAs) 0, 1, 4-7, the Eastern and Western Assessment

Zones and North Atlantic Fisheries Organization (NAFO) Division 3M (i.e. "the IFMP') has undergone significant revisions under a new template from the previous version in 2007. The IFMP is a document that provides a clear and concise summary of the shrimp fishery's characteristics, including the history, location, gear, participants, management issues, decision making processes and biology of the two species harvested (*Pandalus montagui* and *Pandalus borealis*). Further, the IFMP describes the existing previously approved management measures, current functioning, rules and realities of the entire Northern shrimp fishery covering Shrimp Fishing Areas (SFA) 0, 1, 4 – 7, and the management units of the Eastern and Western Assessment Zones (EAZ and WAZ respectively).

Information specifically pertaining to the Nunavut Settlement Area (NSA) and adjacent waters has already been approved through decision making processes between the Board and the Minister. It is important to note that the IFMP contains no new information, nor does it contain any proposed changes to the management regime that would affect any allocation holder, harvester or stakeholder in the fishery in any area, including for allocations in or adjacent to the NSA.

Related, a new addition to the 2017 IFMP is a description of the boundary changes in the north that were implemented in 2013 after consultations, with subsequent agreement from the Board. Information on the boundary changes from the Board's Public Hearing Registry can be found at: https://www.nwmb.com/en/public-hearings-a-meetings/public-hearings-1/2012-1/shrimp-hearing-on-proposed-sfa-2-3-a-4-changes-18/proposal-for-nwmb-decision-and-supporting-evidenc

The 2007 IFMP is currently on the Department's website (http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/ifmp-gmp/shrimp-crevette/shrimp-crevette-2007-eng.htm). Once approved, the 2017 IFMP will replace the 2007 version. As an evergreen document, it will remain in place until such time that further updates are necessary. Information requiring regular updates is largely contained in the appendices, and the main body of the IFMP is to be revised only if there are major changes to the fishery or a significant number of changes accumulate over time. Exceptions to this are the economics and stock scenarios information (section 3 and 2.5 respectively), which will require more frequent updates to reflect the most recent economic analysis and science assessments.

Request:

Given that the updated 2017 IFMP:

- summarizes the current management regime of this fishery and reflects decisions already made, including those resulting from processes between the Board and the Minister;
- does not have any implication to any existing previously approved process / measure in any area of the fishery from SFA 0, 1, 4 – 6 or the EAZ or WAZ, including those used by the Nunavut Wildlife Management Board within or adjacent to the NSA;
- does not propose or imply any new management measures; and
- has undergone a full consultative process with all affected stakeholders, with several opportunities and avenues to submit feedback,

It is therefore recommended that the NWMB approve the revised 2017 IFMP as an evergreen document to replace the 2007 IFMP at the start of the 2018/19 fishery.

**Prepared by: Ecosystems and Fisheries Management,** Fisheries and Oceans Canada

**Date:** November, 2017

Attachments (3):

- Summary Document (Translated)
- Consultation Summary (Translated)
- Draft 2017 IFMP for SHRIMP FISHING AREAS (SFAs) 0, 1, 4-7, the Eastern and Western Assessment Zones and North Atlantic Fisheries Organization (NAFO) Division 3M

Consultation Summary Document – Integrated Fisheries Management Plan Northern and Striped Shrimp

The following describes the consultations the Department undertook with stakeholders in the process to update the Northern shrimp Integrated Fisheries Management Plan (IFMP).

On March 31, 2017, all members of the Northern Shrimp Advisory Committee (NSAC) were advised that the 2007 IFMP for Northern Shrimp had been updated, and that a draft copy had been sent to key representative groups of the NSAC. NSAC members were encouraged to provide comments to their representative organization, which in turn would provide input to the Department. All NSAC members who wished to receive a copy of the revised IFMP were invited to request one. NSAC was reminded that the IFMP process was subject to various Land Claim obligations.

On March 31, 2017, key representative groups of NSAC were sent the revised IFMP and were requested to:

- Collect views from their membership and provide a single document of recommendations / revisions / suggestions;
- Either use tracked changes, or provide the Department with a document that listed suggested edits; and
- Return comments to the Department by May 1, 2017.

The following groups are members of NSAC who were notified of the changes to the IFMP as described above. Key representative groups who were requested to provide comments from their membership are highlighted in yellow:

Atlantic Shrimp Company Ltd.
Baffin Fisheries Coalition
Canadian Association of Prawn Producers (CAPP)
Caramer Limited
Cartwright Fishers
Crevettes Nordiques Ltée.
Ocean Choice International
Harbour Grace Shrimp Company Ltd.
Labrador Fishermen's Union Shrimp Company
Lamèque
Makivik Corporation
Mersey Seafoods Ltd.
M.V. Osprey Ltd.
Newfound Resources Ltd.
Northern Coalition
Nunavut Offshore Allocation Holders Association (NOAHA)
P.E.I Atlantic Shrimp Corp.
Pikalujak Fisheries Ltd.
Qikiqtaaluk Corporation
Torngat Fish Producers Cooperative Society Ltd.
Unaaq Fisheries Inc.
Department of Fisheries, Aquaculture, and Environment P.E.I.
Department of Environment, Government of Nunavut

Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec
New Brunswick Department of Agriculture, Fisheries, and Aquaculture
Newfoundland and Labrador Department of Fisheries and Aquaculture
Nova Scotia Department of Agriculture and Fisheries
Nunavut Wildlife Management Board*
Nunavik Marine Region Wildlife Board*
Nunatsiavut Government
NunatuKavut Community Council
Torngat Joint Fisheries Board (TJFB)*
Association of Seafood Producers (ASP)
Fish, Food and Allied Workers Union (FFAW)
Fogo Island Co-operative Society
Innu Nation – Labrador
Qikiqtani Inuit Association
Nunavut Tunngavik Inc
Regroupement des Associations de Pêcheurs de la Basse Côte Nord
St. Anthony Basin Resources Inc. (SABRI)
One representative from each inshore fleet - (2J, 3K north, 3K south, 3L, 4R, and ACPG)

*The Boards' staff was informed that the Department would return to the Boards at a later time for a formal consultation once the document was in a more complete state.

The representative groups, as well as Makivik Corporation and Nunavut Tunngavik Inc, were invited to participate in two conference calls to discuss the further revised IFMP on Thursday July 13, , and Monday July 17, 2017.

Staff from the Nunavut, Nunavik and Torngat Joint Fisheries Boards was invited to provide comments on the revisions to date on July 17, 2017.

The Canadian Association of Prawn Producers (CAPP) represents 10 of the 17 offshore licences based out of Newfoundland and Labrador, New Brunswick, Quebec and Nova Scotia. CAPP was unable to attend either of the July conference calls and early on requested the opportunity to have discussions on the revisions. A meeting with CAPP was arranged for August 8. The document was revised based on the July conference calls and the meeting with CAPP and sent to the key representative groups to comment.

Based on suggestions from NWMB staff, the IFMP was modified to separately describe the three Land Claims. Additionally, further refinements were made to provide specific information and clarity with regard to Land Claims processes being described in sections 1.3 – 1.7. These changes were sent to staff of the three Boards for comment on August 29.

The document was translated into French and sent to the Government of Quebec and Quebec based stakeholders on September 12, 2017. No comments were received.

Fisheries and Oceans Canada / Pêches et Océans Canada

**Integrated Fisheries Management Plan Summary**
**Species : Northern and Striped Shrimp (Pandalus borealis, Pandalus montagui)**
**Fishing area(s): Shrimp Fishing Areas 0, 1, 4, 5, 6 and Management Units Davis Strait East and West, Nunavut East and West and Nunavik East and West**
**As of 2017**

The purpose of this Integrated Fisheries Management Plan (IFMP) summary is to provide a brief overview of the information found in the full IFMP. This document also serves to communicate the basic information on the fishery and its management to DFO staff, legislated co-management boards and other stakeholders. This IFMP provides a common understanding of the basic “rules” for the sustainable management of the fisheries resource. The full IFMP is available on request.
This IFMP summary is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister's discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.
Where DFO is responsible for implementing obligations under land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

## General Overview/Introduction, including map

The Northern shrimp fishery is commercial in nature and occurs from Nunavut to the Newfoundland shelf and out into the Northwest Atlantic Regulatory Area. It is prosecuted by ~250 inshore licence holders, and an offshore fleet (>100’ sector) consisting of 17 licences (1.5 of which are held by each of Nunavut, Nunavik and Labrador Inuit interests). There are also special allocations held by community and Indigenous groups.

The fishery operates year round from April 1 to March 31, however fishing activity is dependent on ice coverage, and therefore varies by Shrimp Fishing Area (SFA). Notwithstanding closed areas, fishing occurs from the coast of Newfoundland northward into Baffin Bay.

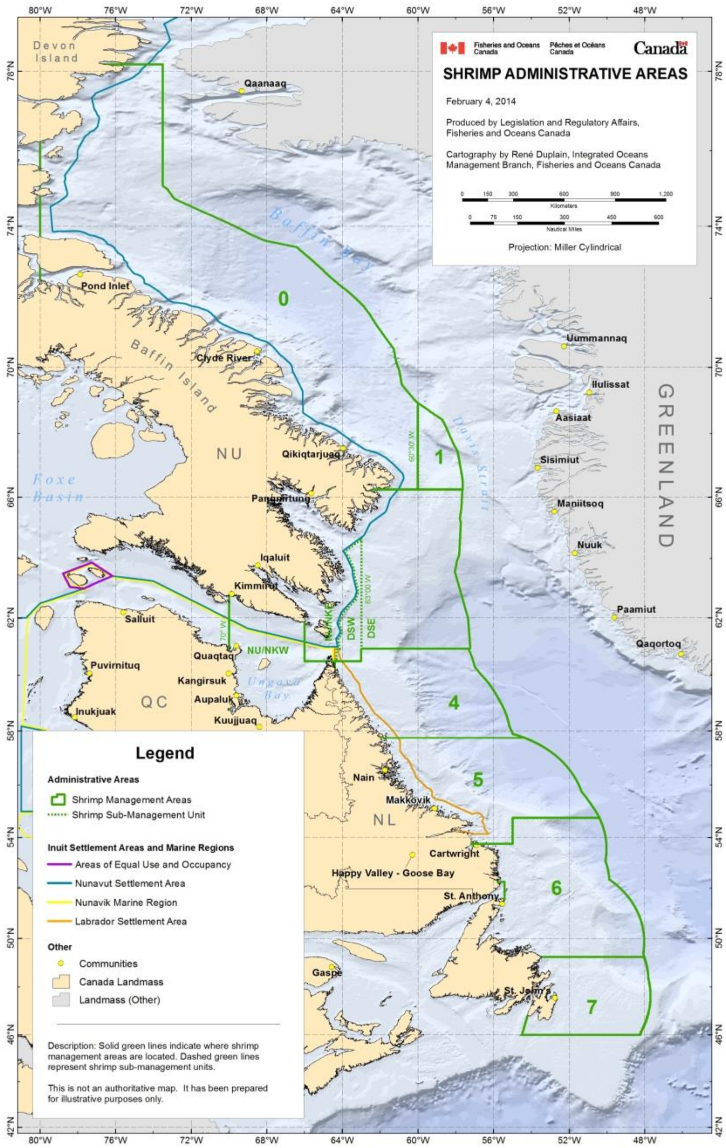
Most of the >100’ sector and inshore sector vessels use otter trawls, with a very limited number using beam trawls. To effectively minimize the bycatch of other species, the use of a Nordmore Grate is a mandatory measure.

The Offshore Fleet

The >100' shrimp sector, comprising vessels with length overall (LOA) greater than 30.48m (100ft) and weight greater than 500t, is comprised of approximately ten factory freezer trawlers. The > 100' sector vessels operate out of ports in Newfoundland and Nova Scotia, with occasional landings in Greenland if fishing in far northern waters (SFAs 0 and 1) as ice and other environmental conditions permit. The shrimp harvested by the >100' shrimp sector is flash frozen at sea, and then packaged for export to various global markets. There has been no increase to the number (17) of >100' shrimp sector Northern shrimp licences issued since 1991.

The Inshore Fleet

The "inshore" sector is composed of the Newfoundland and Labrador (NL) based inshore vessels with maximum LOA < 89'11"), the NL based "midshore" fleet with LOA between 65' and 99'), and the Quebec (QC) fleet comprised of Lower North Shore Quebec based vessels <89' 11".
Shrimp caught by the inshore fleet is landed frozen or fresh to be cooked, peeled and further processed as necessary by onshore licensed processing plants. The inshore fleet's operations are based in NAFO Divisions 2J, 3KL, 4R and are established based on the enterprise's homeport, by NAFO Division in the following manner: 2J, 3K north (north of 50°30'North), 3K south (south of 50°30'North), 3L, 4R and 4S. The majority fish in SFA 6 and from 2000 – 2014 in SFA 7 with limited effort in SFAs 4 and 5.




**Stock Assessment, Science & Traditional Knowledge**

Northern Shrimp are found in the Northwest Atlantic from Baffin Bay south to the Gulf of Maine. Striped Shrimp are found in the Northwest Atlantic from Davis Strait south to the Bay of Fundy. Shrimp are born and first mature as males, mate as males for one or more years and then change sex to spend the rest of their lives as mature females. They are considered harvestable once their carapace length exceeds 17 millimeters, when they are approximately 3 years of age. Shrimp are an important part of the marine food chain. Shrimp feed on a variety of zooplankton and are major prey for several species, such as Atlantic Cod, Greenland Halibut, redfish, skates, wolfish, and Harp Seals. The Department regularly conducts research on shrimp, both independent of other organizations and with other research groups. Resource status of Northern Shrimp in SFAs 5 and 6 is updated annually based on DFO fall multi-species trawl survey data. Resource status for Northern Shrimp and Striped Shrimp in SFA 4, the Eastern Assessment Zone (EAZ), and Western Assessment Zone (WAZ) is updated annually based on the Northern Shrimp Research Foundation-DFO summer shrimp trawl survey data. Trawl survey data provide information on shrimp distribution, length frequencies, and biomass. Trends in fisheries performance are inferred from Total Allowable Catch, commercial catch, fishery catch per unit effort, and fishing patterns. Resource status of Northern Shrimp in SFAs 1 and 7 is assessed by the Northwest Atlantic Fisheries Organization Scientific Council. (SFA 7 has been closed to commercial fishing for Northern shrimp since 2015).

Indigenous and fisher Traditional Ecological Knowledge is an important component of fisheries management and is used with scientific knowledge for effective fisheries decision-making. DFO routinely consults resource users (including under formal Land Claims obligations) on a wide range of topics and incorporates their views, decisions and recommendations where applicable, and traditional knowledge in the development of scientific research and fishery management plans.

**Economic, Social, Cultural Importance**

The commercial harvest of Northern Shrimp has played an important role in Atlantic Canada for several decades. Fishery participants include the >100' and inshore fleets, as well as Special Allocation holders comprised of Indigenous Land Claimants, Indigenous Non Land Claimants and other groups. With 17 >100' vessel licences, and approximately 225 inshore licence holders, the fishery represents an important source of employment and revenue in Atlantic and Arctic Canada.

The Canadian Northern shrimp fishery makes an important contribution to northern development through employment and training of northern residents, including a substantial number of Inuit and Innu residing in northern Labrador, Nunavik and Nunavut. The formation of harvesting partnerships, including arrangements by >100' fleet licence holders who harvest special allocations, has been an important source of revenue in support of northern development. Some special allocation holders in Nunavut are issued a temporary licence and harvest their allocations with their own vessels. Shrimp processing plants provide substantial local employment. In addition, goods and services needed to support vessel operations and land-based processing activities are important contributors to the local economy creating jobs and generating income in service industries. Among the contributing activities are vessel and gear repair, maintenance, stevedoring, provisioning (food and fuel), observer coverage, and travel and transportation.

As one of the world's leading producers of cold-water shrimp Canada has seen landed values (LV) increase 44% in recent years (2013 to 2015), despite declines in landed quantities (LQ) due to total allowable catch (TAC) reductions. The inshore fleet's cumulative LV more than doubled to $116M in 2015, despite a 30% reduction in LQ, while the >100' fleet's LV increased 32% to $350M in 2015, despite a 10% reduction in LQ.

Canadian exports of Northern Shrimp between 2013 and 2015 mirrored the trends in landings, with export volumes falling 14% but export values rising 34% to $439M. The inshore fleet focuses on the shell-off product, which is processed on-shore. Canada's main destinations for this product are the United Kingdom, Denmark, and the United States. In contrast, the >100' fleet focuses on a frozen at sea, shell-on product, which is largely exported to China, Denmark and Iceland.

Although strong demand has fueled sufficient price increases in recent years to offset the impact to export and landed values from decreased LQs, this trend may not continue. Further LQ reductions, or price decreases, have the potential to reverse the growth trend in values.

**Access and Allocations**

*Required text*: The Minister can, for reasons of conservation or for any other any other valid reasons, modify access, allocations and sharing arrangements outlined in this IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

Access is described as “the opportunity to harvest or use fisheries resources, generally permitted by licences or leases issued by Fisheries and Oceans Canada under the authority of the Minister of Fisheries and Oceans. The Department shall take Indigenous and treaty rights to fish into account when providing these opportunities.” Allocation is “the amount or share of the fisheries resource and/or effort that is distributed or assigned by the Minister of Fisheries and Oceans to those permitted to harvest the resource.”

Access to the Northern shrimp fishery is considered stable for both the >100’ sector, the inshore fleet and special allocations holders as of 2016. There is no new access to the Northern shrimp fishery, and consideration must be given to relevant Land Claims when making access and allocation decisions. The Northern shrimp TAC for each of the SFAs 0 to 6 is allocated to the >100’ shrimp sector, special allocation holders and the inshore fleet depending on the SFA. From 1997 – 2015, the Last In, First Out (LIFO) policy was the main tool the Department used to determine access and allocations in each SFA, notwithstanding Land Claims.

Beginning in 2016, the Department, by Ministerial decision, implemented stable percent shares to allocation holders in each of the southern SFAs (4-6). SFA 4 percent shares were modified in 2017. Percent shares determine the amount of allocations to participants in SFAs 4, 5 and 6. Percent shares are not feasible in northern areas where land claims obligations require consideration of allocations arising from any changes in TAC on a case by case basis. Percent shares determine the amount of allocations to participants in SFAs 4, 5 and 6.

Table showing access to and allocations in SFAs 4 – 6 (as percent shares)

| Fleet / Interest | SFA 4 | SFA 5 | SFA 6 | SFA 7* |
|---|---|---|---|---|
| Offshore | 76.2% | 38.04% | 23.1% | 20.2% |
| Inshore | 5.3% | - | 69.6% | 65.7% |
| Innu Nation | 8.5% | 5.19% | 1.7% | - |
| Nunatsiavut Government | 10% | 9.9% | - | - |
| Northern Coalition | - | 28.0% | - | - |
| NunatuKavut Community Council | - | 6.22% | - | - |
| Inshore Affected Cod Harvesters (Cartwright to L'anse au Clair) | - | 8.84% | - | - |
| Inshore Affected Cod Harvesters (Northern Peninsula) | - | 1.04% | - | - |
| St Anthony Resource Basin Inc (SABRI) | - | - | 4.5% | - |
| Fogo Island Co-Op | - | - | 1.1% | - |
| PEI Consortium | - | - | - | 9.4% |
| Miawpukek First Nation | - | - | - | 4.7% |

*Should NAFO take the decision to resume commercial fishing in SFA 7, the quota allocation key will be as described.

In the north, the offshore fleet, Nunavut and Nunavik have access to and allocations in SFA 1. Allocations in Management Units (MUs) Nunavut East, Nunavik East, and Nunavut West and Nunavik West, located in Hudson Strait, are reserved for Nunavut and Nunavik stakeholders, as these areas fall within the

Nunavut Settlement Area and Nunavik Inuit Settlement Area. Nunavut shrimp allocations are sub-allocated to individual Nunavut companies for a specified number of years. Nunavut sub-allocation recipients are issued a temporary licence. The Nunavik Inuit's allocations are transferred to Makivik Corporation to fish on their behalf. Access to the Nunavut and Nunavik MUs is limited to those enterprises that receive allocations in these areas, as amended from time to time.

**Governance Process**

Management of the Northern shrimp fishery is done in consultation with stakeholders primarily through the Northern Shrimp Advisory Committee (NSAC), which generally convenes annually. NSAC strives to reach consensus among stakeholders when making recommendations to the Minister. Stakeholder perspectives, science results and other considerations are presented to the Minister for decision.

To date, there are three land claims agreements in place that must be taken into consideration in the management of the Northern Shrimp fishery: The Nunavut Land Claims Agreement (NLCA), Labrador Inuit Land Claims Agreement and the Nunavik Inuit Land Claims Agreement (NILCA). These Agreements provide for the establishment of resource or wildlife co- management structures whose roles and responsibilities vary from advisory to decision making with respect to adjacent fisheries. The Minister of Fisheries and Oceans retains responsibility for resource conservation and management.

**Shared Stewardship Arrangements**

<u>Working Groups</u>

There are mechanisms not based on policy or a regulatory framework that allow the Department to advance conservation aspects of the Northern shrimp fishery, including working groups of NSAC to address ongoing or one time occurrences in the fishery, such as the Marine Stewardship Council Working Group.

<u>Northern Shrimp Research Foundation</u>

DFO has partnered with the Northern Shrimp Research Foundation (NSRF) to conduct a Northern shrimp survey in SFA 4 and the EAZ since 2005. Beginning in 2014 the NSRF and DFO have worked collaboratively to do the science survey in the WAZ. This survey is the only independent source of information of shrimp stocks in these areas.

Closed Areas

Additionally, there are a number of closed areas in the range of the Northern shrimp fishery, established for several conservation purposes, including the protection of corals and vulnerable marine ecosystems. Inshore crab area closures have been established as a result of concerns about the impact of bottom trawling on Snow crab. A Network of Marine Protected Area (MPAs) and other effective area-based conservation measures (i.e. Fisheries Act closures) is currently being developed within the range of the Northern shrimp fishery.

**Management of the Fishery**

| Management Measure | Description |
|---|---|
| Location | Divided into Shrimp Fishing Areas and Management Units<br>Includes closed areas<br>SFA 7 and Division 3M is closed to commercial fishing |

| | |
|---|---|
| Total Allowable Catch / Quota | Specific to each SFA<br>Access and allocations in each SFA determined by the Minister |
| Licences | Required when fishing |
| Species, area and catch limitations | Directed and bycatch TACs / quotas established for each SFA (where applicable)<br>TAC and quotas are specified by tonnes round weight (completely unprocessed state)<br>Conversion factors are specified, where applicable<br>Fishery is closed if TAC has been harvested (by SFA)<br>Quota Reconciliation is in place<br>Season bridging by the >100' sector is permitted |
| Fishing Season | April 1 – March 31 for all SFAs except for SFA 1 and 7 (January 1 - December 31) |
| Fishing Gear | Otter trawl, 40 mm mesh size, which must be fitted with a properly installed Nordmore grate with a maximum bar spacing of:<br>• 22mm for SFAs 0, 1 and 6; and<br>• 28mm for management units Nunavut East, Nunavik East, Nunavut East, Nunavut West, Davis Strait East, Davis Strait West, and SFAs 4, and 5 |
| Discards and Bycatch | • Nordmore grate is mandatory<br>• Move away provisions to avoid bycatch<br>• Groundfish, northern and spotted wolfish and leatherback turtle bycatch must be returned to the place from which it was taken, and if alive, in a manner that causes the least harm<br>• Reporting of bycatch and discards is required as a condition of licence |
| Reporting requirements | • Use of Vessel Monitoring System unit required<br>• Use of at sea observer coverage, dockside monitoring<br>• Use of logbooks required, detailing up to date records of fishing activity<br>• Reporting of all catches, discards, bycatch<br>• All species at risk interactions, including locations, quantity, weight and condition<br>• Daily hails for the offshore fleet |

**Compliance Plan**

C&P is the enforcement arm of the Department and has the responsibility for promoting and maintaining compliance with legislation enacted for the purpose of protecting our three oceans, coasts, waterways, fisheries and habitats and ensuring that they remain healthy for future generations.

The C&P program is delivered regionally through a balanced regulatory management and enforcement approach including:

- Promotion of compliance through education and shared stewardship;
- Monitoring, Control and Surveillance (MCS) activities; and,
- Management of major cases /special investigations in relation to complex compliance issues.

Allocation of time towards a specific fishery is based in large part on an assessment of risk to the resource. In the Northern shrimp fishery, C&P promotes compliance by the following means:

- Patrols and Inspections
- Dockside Monitoring
- Aerial Surveillance
- Vessel Monitoring
- At-sea Observer Program

**Fisheries and Oceans Canada Contact**

For additional information on this IFMP Summary or to request an electronic version of the full IFMP, please contact _______TO BE DETERMINED_____________.

Fisheries and Oceans Canada　Pêches et Océans Canada

INTEGRATED FISHERIES MANAGEMENT PLAN

Northern Shrimp (*Pandalus borealis*)
and
Striped Shrimp (*Pandalus montagui*)

SHRIMP FISHING AREAS (SFAs) 0, 1, 4-7, the Eastern and Western Assessment Zones and North Atlantic Fisheries Organization (NAFO) Division 3M

Effective 2017

*Pandalus borealis* (Krøyer, 1838)

FOREWORD

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the main objectives and requirements for the Northern shrimp fishery for Shrimp Fishing Areas (SFAs) 0, 1, 4 -7, the Eastern and Western Assessment Zones and the Flemish Cap (NAFO Division 3M) Often referred to as the Northern shrimp fishery, there are two species of shrimp prosecuted *Pandalus borealis* (Northern shrimp) and *Pandalus. montagui* (Striped shrimp). Unless otherwise specified, the ‘Northern shrimp fishery’ and this IFMP pertain to both species.

This plan outlines the objectives of this fishery and the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO) staff, co-management boards and other stakeholders. This IFMP provides a common understanding of the basic “rules” for the sustainable management of the fisheries resource.

This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister's discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

Where DFO is responsible for implementing obligations under land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

This is a ‘rolling’ or ‘evergreen’ plan subject to amendment at the discretion of the Minister of Fisheries and Oceans while respecting the applicable legislation, policies and regulations.

Signature

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Section 1 – Overview of the Fishery

## 1.1 History

The Northern shrimp fishery commenced in the early 1970s when an exploratory fishing program confirmed the presence of commercial abundances of shrimp stocks (*Pandalus Borealis and Pandalus Montagui*) in waters stretching southward from Baffin Island to the northeast coast of Newfoundland. It later expanded to include fishing off the east coast of Newfoundland in Shrimp Fishing Area (SFA) 7 and onto the Flemish Cap (Northwest Atlantic Fisheries Organization [NAFO] Division 3M). Map at Figure 1. A more detailed history of the fishery is available at ANNEX A.

Between 1978 and 1991, seventeen > 100’ sector (offshore) licences were introduced. Quota sharing principles were developed in 1997 and permits were introduced to inshore fish harvesters, thereby giving access to the < 65’ fleet (i.e. the inshore fleet). In 2007, these permits were converted to licences. Since 1997, “special” allocations were provided to Indigenous organizations and community groups, including to Nunavut in adjacent northern SFAs.

Generally, stocks continued to increase until the mid to late 2000s, , after which time the fishable biomass began to decline in southern SFAs, which has been associated with changing oceanic conditions and related ecosystem dynamics. In 2011, NAFO suspended directed fishing for shrimp in Division 3M, and in Division 3L (SFA 7) beginning in 2015. ANNEX B shows Total Allowable Catches (TACs) and allocations by SFA since 1997.

In 2013, the boundaries in the North (SFAs 2 and 3 at the time) were modified to align with scientific surveys and land claim areas. New allocations for both species were granted to Nunavut and Nunavik inside the respective settlement areas (Figure 2).

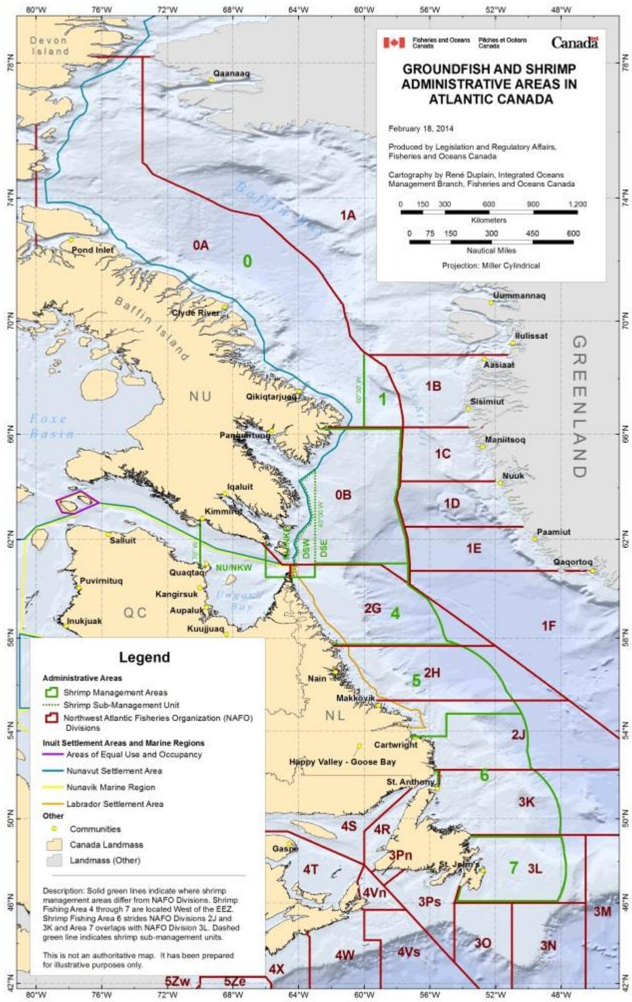


Figure 1. Northern Shrimp Fishing Areas as of 2013.

Between 1997 and 2015, the Last In, First Out (LIFO) policy was the main access and allocation tool the Department used to apply reductions (and occasionally increases in certain circumstances) in TAC. In 2016, stemming from recommendations provided by a Ministerial Advisory Panel, LIFO was abolished and replaced with a proportional sharing arrangement in southern SFAs 4, 5, 6 and 7, should it reopen to commercial fishing. In the areas north of SFA 4, access and allocation decisions will continue to be made through the appropriate consultative processes, in a manner consistent with the Land Claims Agreements. More information on LIFO, including the Ministerial Advisory Panel can be found in ANNEX C.

## 1.2 Type(s) of Fishery

The shrimp fishery in SFAs 0, 1, 4-7, and Davis Strait West is commercial. The fisheries in the Western Assessment Zone (WAZ) and Davis Strait East, and Nunavut and Nunavik East management units are considered to be 'exploratory stage 2' of the New Emerging Fisheries Policy, and are licensed under Section 7 of the *Fisheries Act.* There is no shrimp fishery for food, social, ceremonial or recreational purposes.

## 1.3 Participants

***The >100’ shrimp sector***

Commonly referred to as the ‘offshore’ fleet, there are seventeen >100’ sector licences currently held by fourteen corporate entities. There has been no increase in the number of >100’ shrimp sector Northern shrimp licences issued since 1991. The current > 100’ sector licence holdings by company and representative organization are listed in ANNEX D. The Canadian Association of Prawn Producers (CAPP) and the Northern Coalition (NC) represent 16 of the 17 offshore licences. In total, 4.5 of the > 100’ sector licences are held by Indigenous interests.

The >100’ shrimp sector, comprising vessels with length overall (LOA) greater than 30.48m (100ft) and weight greater than 500t, is comprised of approximately ten factory freezer trawlers. The > 100’ sector vessels operate out of ports in Newfoundland and Nova Scotia, with occasional landings in Greenland when fishing in far northern waters as ice and other environmental conditions permit. The shrimp harvested by the >100’ shrimp sector is size sorted, with most of the sizes being cooked, and then frozen at sea, and packaged for export to various global markets.

Fishing trips last from 20 to 75 days. Vessels generally make about 9 - 12 trips per year, averaging 300-320 sea days annually.

***The Inshore Fleet***

The inshore fleet or sector is composed of Newfoundland and Labrador (NL) based inshore vessels with maximum vessel eligibility of LOA < 89’11”;, the NL-based “midshore” fleet with LOA between 65’ and 99’, and the Quebec (QC) fleet comprised of Lower North Shore Quebec based vessels <89’ 11”.

Between 1997 and 2000 new access for an inshore shrimp fishery was granted to fish harvesters in Newfoundland and Labrador and Quebec in the southern SFAs 4 and 6.

Initially the inshore fleet (NL and QC) comprised of approximately 390 licence holders. Since 2007 through rationalization the number decreased to approximately 260 licence holders. A few of these inshore licences are issued to Indigenous organizations as commercial communal licences. In SFA 6, Quebec harvesters have access to 2.45% of the inshore fleet allocation.

The inshore fleet in NL is represented by the Fish Food and Allied Workers Union (FFAW) through five fleet committees (2J, 3K north, 3K south, 3L, and 4R) elected by the licence holders. The inshore Quebec licence holders are represented by L’Association des Capitaines Propriétaries de la Gaspésie (ACPG).

Shrimp caught by the inshore fleet is generally landed fresh (and sometimes frozen specifically from SFA 4) to be cooked, peeled and further processed as necessary by onshore licensed processing plants. The inshore fleet’s operations are based in NAFO

Divisions 2J, 3KL, 4R and 4S and are administered based on the enterprise's homeport, by NAFO Division in the following manner: 2J, 3K north (north of 50°30'North), 3K south (south of 50°30'North), 3L, 4R and 4S. Currently the fishery is only conducted in SFA 6 with limited effort in SFA 4 and 5, however from 2000 – 2014 the inshore fleet also fished in SFA 7.

***Special Allocation Holders***

During some periods of quota increase in nearly all SFAs, the Minister provided "special" allocations to organizations, communities or entities including Indigenous organizations for their economic benefit. Most of these are not commercial licence holders and, depending on the SFA, their allocations are primarily harvested by the >100' shrimp sector through royalty arrangements. All special allocations in SFAs 4, 5 and 6 can be harvested by either the offshore or inshore fleet. However, in SFA 6, if the inshore fleet harvests the allocation, an arrangement with an inshore fleet must be approved. Additionally, some of these special allocation holders are issued a temporary licence and harvest their allocations with their own vessels. Initially, and until the abolishment of LIFO in 2016, special allocations generally remained at a fixed amount and since many special allocations were the last to gain entry into the fishery, they were the first to be removed or reduced if the TAC fell to certain thresholds under LIFO. However, with the move to proportional percent shares in the southern SFAs in 2016, those special allocation holders in SFAs 4 – 7 now hold a percent share of the TAC in that particular SFA.

***Nunavut, Nunavik and Nunatsiavut Land Claimants***

There are three land claims agreements with provisions relating to the management of the Northern shrimp fishery: The Nunavut Land Claims Agreement (NLCA) (1993), the Nunavik Inuit Land Claims Agreement (NILCA) (2005) and the Labrador Inuit Land Claims Agreement (LILCA) (2007). Each of the agreements provides for consideration of Inuit harvesting opportunities related to shrimp.

Nunavut's shrimp resources are fished by individual Nunavut fishing companies. The NWMB provides its decisions and recommendations to the DFO Minister on the sub-allocation of Nunavut shrimp resources to individual Nunavut based fishing companies for a specified number of years. Nunavut sub-allocation recipients may be issued a temporary licence to participate in the fishery. Also, 1.5 of the offshore shrimp licences are held by a Nunavut fishing company, which provides quotas in SFA 0, 1, the EAZ and 4-7.

Pursuant to NILCA, Nunavik Inuit's shrimp allocations are provided to Makivik Corporation (or a Makivik Designated Organization) to fish on their behalf. Makivik also holds a > 100' sector licence which provides shrimp quotas in SFA 0, 1, the EAZ and 4-7, and therefore the issuance of a temporary licence is not necessary.

Allocations in Management Units (MUs) Nunavut East, Nunavik East in the EAZ, and Nunavut West and Nunavik West, located in Hudson Strait in the WAZ, are reserved for Nunavut and Nunavik shrimp harvesters, as the MUs are located inside the Nunavut Settlement Area (NSA) and the Nunavik Marine Region (NMR).

Labrador Inuit allocations are fished via communal commercial licences issued to the Nunatsiavut Government (NG) which can be harvested by either the offshore or inshore fleet. Portions of the EAZ, SFAs 4 and 5 fall both within the Labrador Inuit Settlement Area (LISA) and adjacent waters as described in the LILCA. A portion of SFA 6 also falls within Waters Adjacent to the Zone. Labrador Inuit interests also have 1.5 offshore shrimp licences which provide quotas in SFA 0, 1, the EAZ and 4-7.

## 1.4 Location of the Fishery

Subject to any closures in effect, the fishery occurs off the coast of eastern Canada from 47°15' N (Flemish Cap and the northern edge of the Grand Banks (Division 3M) to 69° N (Baffin Bay). Most fishing occurs between depths of 200m and 600m. SFAs were created to distribute fishing effort and improve the effectiveness of management regimes.

Prior to 2013, shrimp fishery management in northern waters consisted of many overlapping quotas for both species (*P. borealis* and *P. montagui*). Further, management units were not aligned with the science assessment zones or the Nunavut or Nunavik land claim Settlement Area boundaries. As of 2013 (Figure 1), boundaries were modified and SFAs were aligned with the Nunavut Settlement Area (NSA), the Nunavik Marine Region (NMR) and the EAZ and WAZ survey boundaries. New MUs within these SFAs alleviate concentration of fishing effort for *P. montagui* in the Resolution Island area and also eliminate overlapping management units and quotas. As a result of these boundary changes, new or increasing quotas for *P. montagui* and *P. borealis* in Hudson Strait and Davis Strait were established.

The realignment of boundaries with the survey assessment zones and the creation of management units (MUs) within the NSA and NMR took several years to complete and involved consultation and engagement with relevant management boards and land claims beneficiaries, as well as with other stakeholders (e.g., the offshore fleet and the provinces) in the fishery. The new MUs are enforced by condition of licence. An amendment to the Atlantic Fisheries Regulations will be required to reflect the shrimp MU boundary changes in the WAZ and EAZ. A map of the management boundaries prior to 2013 is at Figure 2.

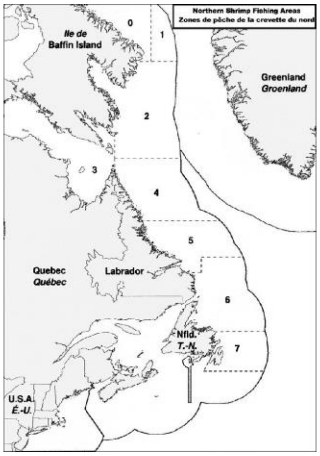


Figure 2 – Map prior to the 2013 Boundary Changes

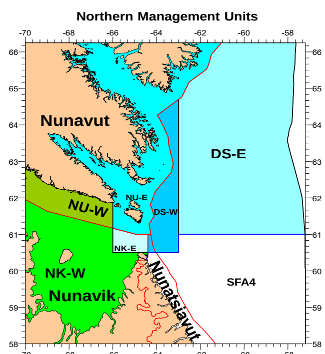


Figure 3- Map showing Eastern Assessment Management Units (Blue) and Western Assessment Management Units (Green)

*P. borealis* (Northern shrimp) is the main species harvested in SFA 0, 1, Davis Strait and SFAs 4-6. *P. borealis* is also harvested as part of the directed shrimp fishery MUs Nunavut and Nunavik West and as bycatch in MUs Nunavut and Nunavik East. A second species, *P. montagui* (Striped shrimp), is directed for in MUs Nunavut and Nunavik East and West, and as bycatch in MU Davis Strait East and SFA 4. Coordinates of the fishery can be found at ANNEX E.

In the shrimp fishery, there are both SFAs and management units. SFA boundaries are the same delineations for both science assessments and management purposes. Management units are smaller management areas within a SFA. Collectively, SFAs and management units are referred to as management areas in this IFMP.

## 1.5 Fishery Characteristics

***Gear***

Most of the >100' sector and inshore sector vessels use otter trawls, with a very limited number using beam trawls. The minimum mesh size for otter and beam trawls is 40mm.

To effectively minimize the bycatch of other species, the use of a Nordmore Grate is a mandatory measure, and is described in detail in Section 7.6.

***Management***

Northern shrimp fishery management is based on a two-year cycle. In year one, DFO Science provides stock status results in a full stock assessment process. TAC recommendations to the Minister are based on science recommendations, the Precautionary Approach framework that includes Harvest Decision Rules, and consultations with stakeholders through NSAC and relevant wildlife management boards. In year two, DFO Science provides a stock status update that is used to determine TAC, also in consultation processes with stakeholders and wildlife management boards.

The >100' sector fishery is managed under the Enterprise Allocation (EA) (ANNEX F) system whereby quota is divided equally among the 17 licences, except in SFA 0 which is fished under a competitive regime. When Division 3M was open to commercial fishing, it was managed using an effort based system, with the > 100' fleet equally sharing Canada's allocation. The >100' sector and Nunavut quotas in the Davis Strait East MU are exploratory (licenced under Section 7 of the *Fisheries Act*) but both exploratory and commercial fisheries are managed consistently. The Nunavut and Nunavik MUs are completely within the NSA and NMR respectively. The >100' sector holds no quota in the Nunavut and Nunavik MUs, and access to these areas is limited to those enterprises that receive allocations in these areas, as amended from time to time.

The inshore fishery in both NL and QC is managed under a competitive regime but in NL the fishery is conducted with trip limits and harvesting caps determined and managed by industry since 1997. The season for this fleet generally occurs from April through to December, with most harvesting between May and October.

## 1.6 Governance

***Fisheries Act, Regulations and Policies***

The Northern shrimp commercial fisheries are regulated by Canada's *Fisheries Act*, and the regulations pursuant to it, including (but not limited to) the *Fishery (General) Regulations*, the *Atlantic Fishery Regulations, 1985*, the *Oceans Act* and the *Species at Risk Act*. The *Fisheries Act* gives the Minister of Fisheries and Oceans ultimate responsibility for the management of marine fisheries. The management of the commercial fisheries is also governed by a suite of policies related to the granting of access, economic prosperity, resource conservation and Indigenous use, including the Commercial Fisheries Licensing Policy for Eastern Canada 1996. Information on these and other policies can be found on the Internet at:
http://www.dfo-mpo.gc.ca/fm-gp/policies-politiques/index-eng.htm

www.dfo-mpo.gc.ca/acts-loi-eng.htm
http://www.fishaq.gov.nl.ca/department/legislation.html

***Sustainable Fisheries Framework***

DFO has had a Sustainable Fisheries Framework (SFF) in place since 2009, which provides the basis for Canadian fisheries (including Northern shrimp) to be conducted in a manner that support conservation and sustainable use. It incorporates existing fisheries management policies with new and evolving policies. The SFF also includes tools to monitor and assess initiatives geared towards ensuring an environmentally sustainable fishery, and identifies areas that may need improvement. Overall, the SFF provides the foundation of an ecosystem-based and precautionary approach to fisheries management in Canada. The policies that facilitate an ecosystem based approach to fisheries management include *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*, *Policy for Managing the Impacts of Fishing on Sensitive Benthic Areas* and the *Policy on Managing Bycatch*.

These documents are available on the Internet at: http://www.dfo-mpo.gc.ca/reports-rapports/regs/policies-politiques-eng.htm

***Land Claims***

To date, there are three land claims agreements in place that must be taken into consideration in the management of the Northern Shrimp fishery: The *Nunavut Agreement, Labrador Inuit Land Claims Agreement* and the *Nunavik Inuit Land Claims Agreement*. These Agreements are treaties within the meaning of section 35 of the *Constitution Act, 1982*. Land claims agreements establish a system for the co-management of fisheries resources within and adjacent to these land claims settlement areas. The Agreements (among other things) set out the harvesting rights of the beneficiaries to the respective Agreements, provide for the establishment of wildlife management structures, set out the role of those structures and cooperative management processes, and set out procedural and substantive requirements on the Minister. The Government of Canada retains ultimate responsibility for wildlife management within and outside respective settlement areas.

The Nunavut Agreement is available at:
http://laws-lois.justice.gc.ca/eng/acts/N-28.7/

The Labrador Inuit Land Claims Agreement is available at:
http://laws-lois.justice.gc.ca/eng/acts/L-4.3/

The Nunavik Inuit Land Claims Agreement is available at:
http://laws-lois.justice.gc.ca/eng/acts/N-28.5/

***Northwest Atlantic Fisheries Organization (NAFO)***

SFA 1 (NAFO Division 0A) is part of a trans-boundary Canada-Greenland stock managed individually by each jurisdiction. The shrimp stock is distributed in NAFO

Subarea 1 (in Greenlandic waters) and NAFO Division 0A east of 60°30'W, which in Canada is fished in SFA 1. At the request of Canada and Denmark (on behalf of Greenland) NAFO's Scientific Council (SC) completes annual assessments of this shrimp stock and provides science advice and a TAC recommendation.

SFA 7 (NAFO Division 3L) is part of a straddling stock managed by NAFO. Canadian harvesters fished in SFA 7 from 2000 – 2014. Consistent with NAFO's precautionary approach framework, SFA 7 has been closed to directed fishing since 2015 due to declines in biomass indices and concern for this resource.

NAFO Division 3M is a high seas stock managed by NAFO but through effort control (limits on number of vessels and days on ground for each member country) instead of quotas. Canadian > 100' sector vessels had fished in this area from 1994 – 2011. 3M has been closed to directed fishing since 2011.

**Decision Making Process**

Management of the Northern shrimp fishery is done in consultation with stakeholders primarily through the Northern Shrimp Advisory Committee (NSAC). NSAC strives to reach consensus among stakeholders when making recommendations to the Minister for decision. Stakeholder perspectives, science results and other considerations are presented to the Minister for decision. The Minister retains ultimate authority and responsibility for management and conservation of fish resources. NSAC membership and terms of reference are located in ANNEX G.

As the Department employs multi-year management for commercial fisheries, NSAC meetings are scheduled every two years, barring any circumstance that may require convening the Committee in interim years. The meetings coincide with the years in which science assessments are conducted and are scheduled to occur in the odd numbered years (2019, 2021, etc). However, in recent years, due to declines observed in the south and the overall economic importance of the fishery, NSAC has generally convened annually.

Minutes of NSAC meetings can be found under "Fisheries" at: http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm#3

In order to address new or ongoing issues, working groups comprised of representation from NSAC membership are formed. Some working groups are struck to resolve single issues, while others function to address longer term issues. Examples of the latter include a working group to oversee Marine Stewardship Council (MSC) certification. Activities of any working group during the year are presented to the Committee at the advisory meeting.

In addition, consultation with the NL inshore shrimp fleet also occurs as needed, generally prior to the start of each season to discuss sharing of the inshore quota among the five inshore fleets (2J, 3Kn, 3Ks, 3L and 4R) and other operational matters as required.

## 1.7 Approval Process

Recommendations of NSAC are brought to the Minister of Fisheries and Oceans for decision. The Minster's decisions are communicated to NSAC and incorporated into the IFMP and / or other departmental documentation (i.e. management decision website) as appropriate.

Overall authority and responsibility for resource conservation and management rests with the Minister. However, in the case of SFAs / MUs that fall within and/or adjacent to defined settlement area boundaries of the Nunavut, Nunavik and/or Labrador Inuit Land Claims Agreements, these Agreements provide for the establishment of resource or wildlife co- management structures whose roles and responsibilities vary from advisory to decision making.

Where co-management structures have both a decision making (within settlement area boundaries) and advisory role (outside settlement areas) under their respective Agreements, the interaction between these structures and the Minister follows a prescribed process whereby the Minister may accept, reject or vary a decision of the co-management structure. Land Claims agreements also set out circumstances and processes for which government must seek the advice of co-management structures as well as the processes for seeking this advice.

In accordance with the terms of the respective agreements, requests for decisions or recommendations are submitted by DFO to relevant Land Claims co-management structures. With respect to shrimp in the NSA and NMR, the NWMB and NMRWB jointly provide TAC recommendations and harvest levels for the respective settlement areas. The TJFB is the primary body to make recommendations to the Minister in relation to conservation and management issues in the LISA, and to advise the Minister on conservation and management of fish in waters adjacent to the Zone.

Other senior departmental officials, such as the Regional Director General, or Director General of Fisheries Resource Management in Ottawa may make management decisions pertaining to the day to day operations of the fishery that are relatively straight forward and that do not relate to TAC.

Fisheries Management decisions can be found at:
http://www.dfo-mpo.gc.ca/decisions/index-eng.htm

# Section 2 - Science

## 2.1 Biological Synopsis

**Northern Shrimp (*Pandalus borealis*)**

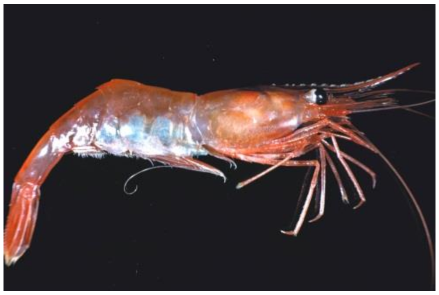

Figure 4: Pandalus borealis, or northern shrimp

Northern Shrimp (*Pandalus borealis*) are found in the Northwest Atlantic from Baffin Bay south to the Gulf of Maine, usually between 150 and 600 metres deep, often in areas where the ocean floor is soft and muddy and where temperatures near the bottom range from about 0 to 6 ºC (DFO 2017a and DFO 2017b).

Northern Shrimp are protandrous hermaphrodites. They first mature as males, mate as males for one to three years and then change sex; spending the rest of their lives as mature females.  Most shrimp reach male sexual maturity during the second or third year of life and generally the transition to the female form takes place in winter when the shrimp are a few years old.  Mating takes place in late summer and fall.  Fertilized eggs are attached to the female's abdominal appendages for seven to eight months until they hatch in the spring. Larvae are pelagic, spending three to four months in the water column. At the end of this period, they move to the bottom and take up the lifestyle of the adults (DFO 2017a and DFO 2017b).

In more northern areas, shrimp are thought to live longer than eight years, while those in the south likely live for six or seven years. Shrimp can grow to about 15 to 16 centimetres in total length, although the average size is about half of this. They are considered harvestable once their carapace length exceeds 17 millimetres, which occurs at approximately three years of age. Most of the fishable biomass is female (DFO 2017a and DFO 2017b) however, the portion that is female varies by area and year.

**Striped Shrimp (*Pandalus montagui*)**

Figure 5 Pandalus montagui, or striped shrimp

Striped Shrimp (*Pandalus montagui*) are found from Davis Strait south to the Bay of Fundy. Striped Shrimp prefer a hard bottom and are typically found in waters with a temperature of -1 to 2 ºC at depths of 100 to 500 metres (DFO 2017a and DFO 2017b).

Striped Shrimp are protandrous hermaphrodites, functioning as males early in their lives then changing sex and reproducing as females for the remainder of their lives. Females usually produce eggs once a year in late summer to fall and carry them, attached to their abdomen, through the winter until spring, when they hatch. Newly hatched shrimp spend three to four months as pelagic larvae. At the end of this period, they move to the bottom and take up the lifestyle of the adults. They migrate into the water column during the night. The migration consists of mainly males and smaller females (DFO 2017b).

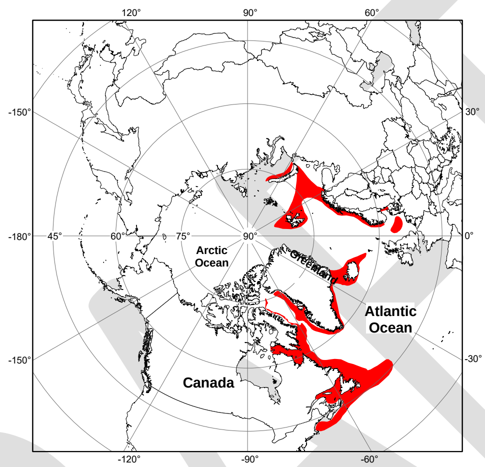


Figure 6. Distribution of Northern Shrimp (*Pandalus borealis*) in the northern hemisphere (redrawn and modified from Bergström Bergström, 2000)

**Life cycle of *Pandalus borealis***

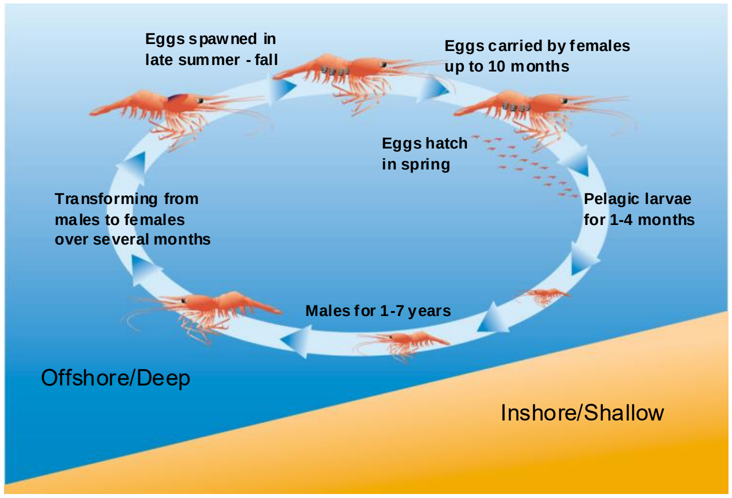


Figure 7. The general life cycle of *Pandalus borealis* and *P. montagui* (Aschan, pers comm.)

## 2.2 Ecosystem Interactions

The recent long-term warming trend in waters of the northwest Atlantic is associated with both climate change and the warm phase of the Atlantic Multi-Decadal Oscillation. A suite of associated changes (e.g. slowing down of the Labrador Current, reduction in ice coverage, more frequent extreme weather events) can have important effects on the marine ecosystem impacting all trophic levels. A warming ecosystem may affect many commercial species (DFO 2014).

Sea ice dynamics are an important driver of the spring phytoplankton bloom. The timing of the bloom has an influence on Northern Shrimp recruitment and has been correlated with shrimp production rates. Overall, ecosystem production seems to be, at least in recent decades, mainly regulated by bottom-up processes. This implies that current trends in the climate system and lower trophic levels would be expected to impact overall ecosystem productivity (DFO 2014).

As a forage species, shrimp is an important prey item for several species, including Atlantic Cod (*Gadus morhua*), Greenland Halibut (*Reinhardius hippoglossides*), redfish (*Sebastes spp*.), skates (*Raja radiate, R. spinicauda*), wolffish (*Anarhichas* spp.), and Harp Seals (*Phoca groenlandica*). This is particularly important when the availability of alternate high-energy prey is low.

Shrimp are primarily harvested by bottom trawls, which can disrupt benthic communities and habitats such as corals and sponges. Concentrations of coral and sponge constitute "Significant Benthic Areas" that are sensitive to bottom trawling due to the sessile nature and low growth rate of these organisms. Benthic communities may also constitute fragile ecosystems in that bottom trawling can reduce their diversity and modify their structure. In 2010, DFO held a national science advisory process to review available information and provide science advice regarding the occurrence, sensitivity and ecological function of corals, sponges and hydrothermal vents in Canada. Information on this process can be found at: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2010/2010_041-eng.html. Further refinement of the delineation of aggregations of cold-water coral and sponge as Significant Benthic Areas, and presentation of information on the fishing activity in relation to these significant areas, was reviewed at a national science advisory process in 2016. The Science Advisory Report resulting from this process can be found at: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_007-eng.html.

## 2.3 Indigenous Traditional Knowledge and Fisher Traditional Ecological Knowledge

Indigenous and fisher Traditional Ecological Knowledge (TEK) is an important component of fisheries management and is used together with scientific knowledge for effective fisheries decision-making. DFO routinely consults resource users on a wide range of topics (e.g. management issues, stock assessment studies, quotas and management measures), and incorporates their views and traditional knowledge in the development of scientific research and fishery management plans. While Indigenous peoples did not traditionally fish Northern shrimp, Indigenous and commercial fishers have knowledge of the marine ecosystem (e.g. climate change, sea ice patterns) and their observations can contribute to an understanding of long-term changes in environment that ultimately affect the management of the Northern shrimp fishery.

## 2.4 Stock Assessment

Stock assessment results can be found on the DFO Canadian Science Advisory Secretariat website: http://www.isdm-gdsi.gc.ca/csas-sccs/applications/Publications/index-eng.asp (See ANNEX H: Stock Assessment and Precautionary Approach.)

Resource status is assessed based on indices from fishery-independent surveys conducted by DFO and industry, trends in fishery catch per unit effort (CPUE) derived from logbooks and observer datasets, and biological sampling from multiple sources. Resource status in SFAs 5 and 6 (Northern Shrimp) is updated annually based on DFO fall multi-species trawl survey data. Resource status in the EAZ, WAZ and SFA 4 (Northern and Striped Shrimp) is updated annually based on Northern Shrimp Research Foundation-DFO summer trawl survey data.

The surveys provide information on shrimp distribution and length frequencies which are used to calculate indices of total abundance, fishable biomass and spawning stock biomass. Additionally, the fall multi-species surveys provide data on bottom temperature, predation and consumption. Fishable biomass is the weight of all shrimp (both males and females) which have a carapace length greater than 17 millimetres. Female spawning stock biomass is defined as the weight of all female shrimp regardless of size, though most are of fishable size. To determine the exploitation rate index, the commercial catch is divided by the survey fishable biomass index from the previous year (for fall surveys) or from the same year (for summer surveys) (DFO 2017a and DFO 2017b).

The various indices also provide information on fishery performance, including exploitation rate and distribution of fishing effort, composition of shrimp catches, and inferences on the state of fishable biomass and female spawning stock biomass. Information on female spawning stock biomass has been used to develop proxy reference points under the Precautionary Approach Framework for some stocks.

## 2.5 Stock Scenarios

Northern Shrimp – SFA 7

The Northern shrimp stock in SFA 7 has declined since 2007 and is below the limit reference point for biomass ($B_{lim}$). Due to declines in biomass indices and concern for this resource, SFA 7 has been closed to directed fishing since 2015.

Northern Shrimp – SFA 6

The Northern shrimp resource in SFA 6 has been declining since 2006 and is in the critical zone of the precautionary approach framework. As of the 2016 survey, fishable and female spawning stock biomass indices were at the lowest levels since this DFO multi-species survey time series began in 1996. Environment and ecosystem indicators in the area indicate that indices will likely remain low in the short term (DFO 2017b).

Northern Shrimp – SFA 5

The Northern shrimp resource in SFA 5 is in the healthy zone of the precautionary approach framework. Biomass index declines are more difficult to interpret in this area due to the narrow range of biomass indices (DFO 2017b).

Northern Shrimp – SFA 4

The Northern shrimp resource in SFA 4 is in the healthy zone of the precautionary approach framework. The Biomass has not shown a significant trend in either direction since the survey began in 2005 (DFO 2017b).

Striped Shrimp – SFA 4

The fishable biomass for the Striped shrimp resource in SFA 4 has varied without trend. The fluctuations in the fishable biomass index are likely due to the strong currents near the northern border. There is no TAC for this resource but a bycatch limit is in place (DFO 2017b).

Northern Shrimp – Eastern Assessment Zone

The Northern shrimp resource in the Eastern Assessment Zone is in the healthy zone of the precautionary approach framework. The fishable biomass index has varied without trend around the long-term mean. The fluctuations in biomass are likely due to strong currents in Hudson Strait (DFO 2017a).

Striped Shrimp – Eastern Assessment Zone

The fishable biomass index within the PA Framework for the Striped shrimp resource in the Eastern Assessment Zone has varied without trend around the long-term mean. The fluctuations in the fishable biomass index are likely due to the strong currents near the southern border (DFO 2017a).

Northern Shrimp – Western Assessment Zone

The Northern shrimp resource in the Western Assessment Zone decreased in 2016 compared to 2015. The 2014 survey began a new time series, not directly comparable with previous surveys. Because the time series is so short, trends cannot yet be inferred (DFO 2017a).

Striped Shrimp – Western Assessment Zone

The Striped shrimp resource in the Western Assessment Zone decreased in 2016 compared to 2015. The 2014 survey began a new time series, not directly comparable with previous surveys. Because the time series is so short, trends cannot be inferred. (DFO 2017a)

Northern Shrimp – SFA 1

The Northern shrimp resource in SFA 1 is a part of the Canada/Greenland shared population, with Canada having an access to a relatively small portion of the fishery. The assessment of the entire stock is performed by the NAFO SC, while each fishery is managed by individual countries. In 2016 the stock was assessed to be in relatively good condition (11% above $B_{msy}$). The risk of the stock being below the $B_{lim}$ was very low (less than 1%). The outlook for this stock is positive, with either a stable or positive growth trajectory, providing the mortality pressure remains the same.

## 2.6 Precautionary Approach Framework for Northern Shrimp

The Fishery Decision-Making Framework Incorporating the Precautionary Approach (PA) applies to fish stocks that are the targets of a commercial, recreational, or subsistence fishery. It may be applied more broadly to other stocks, if necessary or as circumstances warrant.

The Framework requires that a harvest strategy be incorporated into respective fishery management plans to keep the removal rate moderate when the stock status is healthy, promote rebuilding when stock status is low, and provide for a low risk of serious or irreversible harm to the stock. It also requires a rebuilding plan is in place when a stock reaches the Critical Zone. In general, the precautionary approach in fisheries management is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone or fail to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted as an essential part of sustainable fisheries management (DFO 2006).

A precautionary approach to the management of the shrimp fishery, consistent with the basic tenants set out in the Framework, is in place for most Northern Shrimp fishery areas. Priority is given to monitoring the stock and establishing a data time series to support management decisions. Biomass indices, commercial catch levels, and exploitation rate indices are used to indicate stock status. Scientific uncertainty is quantified by including standard errors for these indices. This approach is based on biological criteria established by Science and peer-reviewed through the applicable Canadian Science Advisory Secretariat (CSAS) or NAFO Scientific Council processes. Scientific uncertainty and uncertainty related to the implementation of management measures for Northern shrimp are explicitly considered when evaluating stock status and making management decisions. The application of a precautionary approach to this fishery is done in concert with industry, co-management organizations, and other stakeholders through NSAC and other relevant processes.

<u>Precautionary Approach Reference Points</u>

Reference points for Northern shrimp were developed using proxies. The provisional upper stock reference (USR) was defined as 80%, and the provisional lower reference point (LRP) as 30%, of the geometric mean of female spawning stock biomass (SSB) index over a productive period. Because of differences in survey history, the reference periods were taken to be 1996-2003 for SFA 6, 1996-2001 for SFA 5, 2005-2009 for SFA 4, and 2006-2008 for EAZ. Reference points for Striped Shrimp in SFA 4, EAZ, and WAZ, and for Northern Shrimp in WAZ are in the process of being developed.

Reference Points for Northern (borelais) and Striped (montagui) Shrimp

| SFA | Critical Zone | LRP | Cautious Zone | USR | Healthy Zone |
|---|---|---|---|---|---|
| SFA 4 borealis | SSB<20,400 t | 20,400 t | 20,400 t ≤ SSB < 54,400 t | 54,400 t | SSB≥54,400 t |
| SFA 5 | SSB<15,200 t | 15,200 t | 15,200 t ≤ SSB < 40,700 t | 40,700 t | SSB≥40,700 t |
| SFA 6 | SSB<82,000 t | 82,000 t | 82,000 t ≤ SSB < 219,000 t | 219,000 t | SSB≥219,000 t |
| EAZ borealis | SSB<6,800 t | 6,800 t | 6,800 t ≤ SSB < 18,200 t | 18,200 t | SSB≥18,200 t |
| EAZ montagui | SSB<2,300 t | 2,300 t | 2,300 t ≤ SSB < 6,100 t | 6,100 t | SSB≥6,100 t |

A harvest rate strategy is the approach taken to manage the harvest of a stock and is a necessary element of any fishery plan. In order to implement the PA, pre-agreed harvest decision rules and management actions for each zone are essential components of a harvest rate strategy. Harvest Decision Rules for shrimp stocks with a PA in place are at ANNEX I.

References for additional information on stock status and the Precautionary Approach for Northern and Striped Shrimp are in ANNEX H.

## 2.7 Research

Shrimp are an important forage species within the ecosystem, particularly in the absence of alternative high energy prey, and therefore management of the shrimp fishery should adopt a more conservative approach than would otherwise be adopted under a single species management approach. There is a need for a better understanding of ecosystem demands and impacts of commercial fishing on shrimp as a forage species and to incorporate this into future assessments. This research would be reflected in the use of additional ecosystem indicators in the assessments and in the future modelling work that will help develop, and refine, new precautionary approach reference points (DFO 2013). A better understanding of these factors could potentially lead to ecosystem based management rather than single species management.

Effects of climate change on shrimp resources should be considered when making management decisions. More research is required to determine whether environmental variables could be used in conjunction with recruitment signals to predict future stock size (DFO 2013).

The Department conducts research independent of other organizations but also in concert with other research groups, such as NAFO's Scientific Council and the Northern Shrimp Research Foundation (NSRF). For a list of research activities, see ANNEX J. This list of ongoing and potential future research activities should be considered as provisional, and as such is subject to change. For example, SFA 7 is managed by NAFO and ultimately the Department can make requests for research but any final decisions are outside of our purview. Additionally, considerations such as emerging issues, changing priorities as well as the availability of human and financial resources influence the research undertaken.

Literature Cited

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## Section 3 Economic, Social and Cultural Considerations

The Northern shrimp fishery in Canada makes an important contribution to regional economic development and growth in Eastern Canada and the Arctic through the use of required operational goods and services and the employment and training of local residents engaged in the various steps of the shrimp supply chain from harvesting to processing to distribution/export. The Arctic Northern shrimp fishery vessels employ a substantial number of Inuit and Innu residing in northern Labrador, Nunavik and Nunavut (See Annex K for further employment information). The formation of Northern harvesting partnerships has been an important source of revenue for Northern development. The Northern shrimp fisheries supports harvesting as well as processing plants and logistics services, providing important local employment most notably in Newfoundland and Labrador, but also in New Brunswick, Nova Scotia and Quebec. Additionally, goods and services needed to support vessel operations and land-based processing production and distribution are important contributors to the local economy creating jobs and generating income in various industries. Among the contributing activities are vessel and gear repair, maintenance, stevedoring, provisioning (food and fuel), observer coverage, and travel/transportation.

### 3.1 Domestic Landings[1] and Exports

Canada, as one of the world's leading producers of cold-water shrimp, saw a strong increase of 44% in landed value for the Canadian Northern Shrimp fishery from 2013 to 2015 (See Annex K, for details on landings, including by fleet). This increase was exclusively due to notable price increases, as landed quantities decreased 17% over the same period.

The Canadian Northern Shrimp fishery is harvested by two fleets; the <89’11” inshore fleet and the >100’ offshore fleet. Inshore vessels deliver mainly wet shrimp to onshore plants for processing (cooking and peeled). The >100’ fleet processes and packages shrimp on board factory trawlers, primarily cooked shell on;. raw small size (industrial) shrimp that is too small for cooked shell-on markets is cooked and peeled in shore-based processing plants in Canada and other countries.

[1] Source: Canadian Atlantic Quota Reports

Export volumes of Canadian Northern shrimp decreased 14% from 77,000 mt in 2013 to 67,000 mt in 2015[2]. The value of Northern shrimp exports increased annually from $327M in 2013 to $439M in 2015 (See Annex K for more detail). Northern shrimp accounted for approximately 7% of Canada's total fish and seafood export value in 2015. Of this, 80% was generated by Canada's top four export destinations in Asia and Europe, in particular China ($126M), Denmark ($88M), the United Kingdom ($85M), and Iceland ($52M). There was strong price growth over the period, with average prices for all Northern Shrimp products rising 56%. Prices received by Canadian producers are influenced by the interaction of global supply and demand of shrimp (cold-water and warm-water shrimp) and shrimp substitutes, as well as other factors (resource availability, exchange rates).

| Section 4 Management Issues |
|---|

## 4.1 Management Challenges during Periods of Ecosystem Change

The decline in shrimp production in SFA 6 has been associated with various environment and ecosystem changes including a recent warming trend, early timing of the phytoplankton bloom and increasing biomass of predatory fishes.. Given declining per-capita net production of shrimp, commercial fishing pressure will now be influencing stock declines more than it did in the past (i.e. prior to 2009).The current PA (Section 2.6) was defined based on the mean of female spawning stock biomass index over a productive period, based on available data and consistent with the PA Framework. It has been suggested that the current reference points may not be appropriate for the current state of the shrimp resource as they were derived based on a period of more favourable ecosystem conditions. A Science Response Process was held in 2017 to review the reference points used in the PA for Northern Shrimp in SFA 6. The report from this process can be found at http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2017/2017_009-eng.html. It was concluded that it is not currently clear whether shrimp are experiencing a new productivity regime, whether there were low or high productivity regimes in the past, or where the stock lies relative to its potential production in current conditions. Due to the uncertainties, the current reference points remain unchanged at this time. However, DFO Science is working on developing models for Northern Shrimp in SFA 4-6. If an appropriate model is developed, it will be used to inform the need to revise the current PA and to predict how the stock will respond to different exploitation rates.

## 4.2 Climate Change

It is not known to what extent climate change affects shrimp abundance, distribution or overall ecological conditions, including predator prey relationships.

[2] Source: DFO EXIM Trade Database: Statistics Canada, International Trade Division.

The long-term warming trend in waters off of NL is associated with climate change, and with the warm phase of the Atlantic Multi-decadal Oscillation, a key indicator of climate conditions over the North Atlantic. Associated with the warming trend is the slowing down of the Labrador Current, a reduction in ice coverage, and more frequent extreme weather events which can have important effects on the ecology of the marine ecosystem, impacting all trophic levels and long-term prospects for commercial species.

Given that the current warm phase is expected to continue in the near term in NAFO Divisions 2J3KL (Southern SFA 5, and the entirety of SFAs 6 and 7), and may possibly persist for more than a decade, the Department held a science response process in the summer of 2014 to provide an overview of the prospects for key Newfoundland and Labrador stocks, including Northern shrimp, over the next three to five years within the context of increasing temperatures. The warming trend in environmental conditions has a detectable negative impact on shrimp production. Reduced productivity is also associated with the increasing biomass of predatory fish and exploitation rates of shrimp.

Unfavourable environmental conditions for shrimp are expected to continue in the short term. The Science response can be found at http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ScR-RS/2014/2014_049-eng.html

## 4.3 Conflicts between shrimp and crab

Snow crab and shrimp fisheries occur on common grounds in Divisions 2J3K. The presence of conflict has resulted in research activities and closed areas. Results of a 2005 study indicated that shrimp bottom trawling could be associated with an increased incidence of crab damage (i.e. leg loss). However, there is no evidence that shrimp trawling imposes substantial mortality on hard-shelled Snow crab.

An area of the Hawke Channel was closed to all fisheries, except Snow crab, beginning in 2002. The primary rationale for the closed area was in response to the Fisheries Resources Conservation Council recommendations in 2000 and 2001 to protect juvenile turbot and spawning cod respectively. The crab harvesters in 2J supported the closure as it addressed their concerns of the possible negative effect of shrimp trawling on the snow crab resource. A 2012 study found the closure had no impact on improving Snow crab catch rates. An area of 3K, in the Funk Island Deep, was first closed to gillnetting in 2002 and was later closed to bottom trawling through a combination of mandatory and voluntary closures in 2005 out of concern for Snow crab. No formal studies on the effectiveness of this closure have been conducted to date. (Additional information on Closed Areas can be found in Section 7.3.)

## 4.4 Groundfish Bycatch / Presence of Groundfish

The use of the Nordmore grate markedly reduced groundfish bycatch, however increases in some groundfish stocks have resulted in the potential for increased bycatch . This increase in groundfish has and may continue to require the implementation of additional management measures that allow the Northern shrimp fishery to operate efficiently while not jeopardizing recovering groundfish stocks. As knowledge on bycatch and its impact improves, management measures may be introduced or modified in licence conditions (e.g. move away provisions) or other mechanisms.

As the presence of groundfish, most notably cod, has increased in the southern areas, inshore fishers are of the view that its presence and abundance may be altering shrimp behavior, presence and abundance, causing shrimp to move higher in the water column where it would not be detected by the DFO multi-species surveys. Additionally, shrimp are an important food source for cod and the increased predation overall ,particularly while alternative high-energy prey (i.e. capelin) is low, may be having a negative impact on shrimp. This is one of the priorities identified by the Science / Resource Management Working Group mentioned in section 8.1.

## 4.5 Depleted Species

***Species at Risk Act (SARA)***

The leatherback sea turtle (*Dermochelys coriacea*) is listed as endangered under SARA and is occasionally encountered in the Northern shrimp fishery, however the use of the Nordmore grate prevents it from being inadvertently captured. Two species of wolffish, *Anarhichus denticulatus* (Northern) and *Anarhichus minor* (Spotted), are bycatch in the Northern shrimp fishery and listed as *threatened* under SARA. A third species, the Atlantic Wolffish (*Anarhichas lupusis*) is also listed under SARA with Special Concern designation.

Northern shrimp licence conditions prohibit the retention of the above mentioned SARA species listed as endangered or threatened and clearly state that it must be returned to the place from which it was taken, and if alive, in a manner that causes it the least harm. Further, the licence conditions require that any interactions with species at risk must be reported in the logbook, detailing location, time of catch and the quantity, weight and condition (alive or dead) of the animal.

For further details, please visit the SARA Public Registry at http://www.registrelep-sararegistry.gc.ca/default.asp?lang=en&n=24F7211B-1

## 4.6 Oceans and Habitat Considerations

***Benthic Issues***

As described in Section 7.3, there are several mandatory and voluntary closures within the geographic range of the Northern shrimp fishery to address concerns for various species and/or sensitive benthic habitats. NSAC established a Working Group on Closed Areas (later renamed the Ecosystems Working Group) to specifically address benthic issues should they arise and to provide related advice to NSAC.

## 4.7 Gear Impacts

A review of trawl impacts was conducted in 2006 by the Department, which concluded that bottom-contact gear have an impact on benthic populations, communities and habitats. Addressing impacts requires case by case assessments, with solutions customized to the particular set of circumstances leading to the impacts. The 2006 review of trawl impacts can be found at http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2006/2006_025-eng.htm

Because the trawl is mechanically attached to the vessel, losing gear in this fishery is extremely rare. Due to the cost, most, if not all vessels will search and retrieve any lost trawl.

### 4.8 International Issues

NAFO Division 0A east of 60°30' W and Subarea 1, which in Canadian waters occurs in SFA 1, is a transboundary stock stock between Canada and Greenland. In response to requests from both jurisdictions, the NAFO Scientific Council provides scientific advice on catches. There is currently no agreement in place between the two countries regarding processes to set the global TAC, or to determine sharing arrangements. Canada and Greenland have entered into both formal and informal discussions that seek to advance progress on achieving a joint management approach to this stock. In the absence of such an agreement, and based on its own assumptions of risk, Greenland sets its own TAC and assigns Canada a percentage of this TAC (less than 3%). Canada, on the other hand, traditionally sets a global TAC consistent with Scientific Council advice, and claims roughly 14.2% of this to be fished domestically.

Until such time that an agreement is in place, Canada continues to unilaterally establish the TAC and claim its share of 14.2%. Harvest Decision Rules for SFA 1 are at ANNEX H.



## 5. Objectives

### 5.1 FISHERY OBJECTIVES

Fisheries and Oceans Canada, with its co-management partners and stakeholders, strives to manage this fishery to maximize economic benefits in an ecologically sustainable manner. The long-term objectives relate to conservation and sustainable harvest, benefits to stakeholders and the co-management of the shrimp resource. Corresponding short term objectives, strategies and management measures have been implemented, or are in the process of being developed.

**Conservation and Sustainable Harvest** (Long term objective)

- To promote the sustainable utilization of Northern shrimp stocks.
- To promote cost-effective harvesting strategies that ensures compliance with objective-oriented management and conservation measures and promotes a responsible image for all fleet sectors.
- To mitigate the negative impacts on other species, habitat, and the ecosystem

where shrimp fishing occurs.
- Within specified resource management constraints, to promote a harvest level that stabilizes industry infrastructure and meets marketing requirements, in the pursuit of economic viability objectives for the shrimp sector.
- To promote fishing practices that avoid or mitigate negative impact on sensitive habitat and species.
- To explicitly recognize the ecosystem role of shrimp in TAC-setting decisions, particularly as a forage species.
- To keep stocks in, or return to the Healthy Zone as per the PA Framework.

| **Strategies (short term objective)** | **Management Measures (short term objective)** |
|---|---|
| **Precautionary Approach**<br>• Utilize a precautionary approach framework when setting exploitation rates for the directed fishery<br>• The significant role of shrimp as a forage species is taken into account in decision making<br>• Manage activity in ecologically sensitive areas<br>• Promote the development of sustainable fishing practices.<br>• Manage by-catch or mortality for all non-targeted species<br>• Employ effective monitoring and surveillance tools and mechanisms that ensure compliance with conservation measures | **Precautionary Approach ( Section 2.6)**<br>• Provide biomass and abundance estimates through timely science surveys<br>• Utilize indicators of stock and fishery change<br>• Control fishing mortality by setting annual TAC, taking into account the role of shrimp in the ecosystem<br>• Utilize appropriate exploitation rates and reference points, which take into account the role of shrimp in the ecosystem<br>• Use fishery closures / closed areas to achieve conservation objectives as required<br>• Prohibit bottom contact fishing in established Sensitive Benthic Areas<br>• Enforce regulations against discarding and highgrading<br>• Require a maximum of 22 (SFA 6,7) or 28 mm (SFA 1,4, 5 and in the management units in the Eastern Assessment Zone (EAZ) and Western Assessment Zone (WAZ)) separator grates as condition of licence<br>• Require live release of species listed under SARA as endangered or threatened<br>• Observer coverage is targeted at 100% for > 100' vessels and 10% for inshore boats<br>• Use of Vessel Monitoring Systems for all shrimp boats<br>• Employ Dockside Monitoring Programs for 100% of inshore landings<br>• Employ aerial and dockside surveillance in addition to period audits of landings and catch |

| | |
|---|---|
| | information outside regular operations |

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**Benefits to Stakeholders (long term objective)**

- To promote the continued development of a commercially viable and self-sustaining fishery
- To provide fair access to and equitable sharing of the Northern shrimp resource.
- Helps industry maintain Marine Stewardship Council Certification

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**Strategy (short term)**

- No new access to this fishery
- When dealing with TAC changes in the SFAs 4, 5 and 6, use percent shares as the primary policy guiding allocations. When dealing with TAC changes in the northern SFAs in the WAZ and EAZ, make allocation decisions on a case by case basis, respecting Land Claim obligations
- Balance fleet capacity with resource availability
- Enterprise and licence combining for the inshore fleet
- Fulfill obligations with respect to fishery resources as defined in the Nunavut Land Claims Agreement, the Labrador Inuit Land Claims Agreement and the Nunavik Inuit Land Claims Agreement.

</td><td>

**Management Measures (short term)**

- Continue Enterprise Allocation structure for >100’ sector
- Continue to limit entry to the fishery through licensing
- Consult with management boards in Land Claim areas on TAC levels in or adjacent to their settlement area waters

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<tr><td colspan="2">Co-management of the Resource (long term objective)<br>• Co-management of the resource in or adjacent Land Claim settlement areas involves working with the Inuit of Nunavut, Nunavik, and Nunatsiavut<br>• At NAFO, for the Flemish Cap (3M) and 3L shrimp fisheries, to promote a TAC and quotas management scheme, or otherwise controlling fishing effort to achieve a sustainable fishery.<br>• With Greenland, for NAFO Division 0A and Subarea 1 shrimp, to continue to promote an agreed TAC and quota and management scheme.<br>• To promote a co-management approach, providing licence holders with an effective sharing of responsibility, accountability and decision making, within the constraints of the Fisheries Act, the precautionary approach and Harvest Decision Rules.</td></tr>
<tr><td>Strategy (short term objective)<br>• Regular and open dialogue and communication to help foster relationships with Land Claimants; adherence to obligations as per various Land Claims<br>• Maintain an effective consultative process for resource users to participate in the decision-making process<br>• Establish Multi-stakeholder Working Groups designed to examine domestic and international issues, e.g. Conservation and Compliance, Closed Areas, Marine Stewardship Council Certification<br>• Contribute to and participate in NAFO meetings<br>• Providing experts to NAFO Scientific Council<br>• Conduct bi-lateral negotiations between Canada and Greenland, with input and participation from industry<br>• Manage Joint Project Agreement between DFO and the Northern Shrimp Research Foundation to pursue mutually beneficial scientific activities</td><td>Management Measures (short term objective)<br>• Organize annual Northern Shrimp Advisory Committee (NSAC) meetings<br>• Convene Working Groups as appropriate<br>• Convene Shrimp Working Group under NAFO consultative process as appropriate<br>• Convene domestic consultations and bi-lateral discussions with Greenland as appropriate<br>• Collaboratively define science priorities and design appropriate research activities</td></tr>
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At advisory meetings, a review of the P. borealis and P. montagui fisheries takes place which includes a discussion of whether these objectives are being met and key management issues are being addressed. As part of this process, the information gathered through other evaluation processes like the Department's Sustainability Survey for Fisheries is used to help identify areas for improvement in the management of these fisheries and through consultation with stakeholders, potential improvements are explored and priorities established.

# 6 ACCESS AND ALLOCATION

## 6.1 Access and Allocations

In addition to measures based on precautionary and ecosystem-based management, DFO applies principles of *access* and *allocation* to the administration of the Northern shrimp fishery.

Access is described as "the opportunity to harvest or use fisheries resources, generally permitted by licences or leases issued by Fisheries and Oceans Canada under the authority of the Minister of Fisheries and Oceans. The Department shall take Aboriginal and treaty rights to fish into account when providing these opportunities."

Access to the Northern shrimp fishery is considered stable for both the >100' sector and the inshore fleet. There is no new access to the Northern shrimp fishery, and consideration must be given to relevant Land Claims when making access and allocation decisions.

Allocation is "the amount or share of the fisheries resource and/or effort that is distributed or assigned by the Minister of Fisheries and Oceans to those permitted to harvest the resource."

The Minister can, for conservation purposes or for any other valid reasons, modify access, allocations and sharing arrangements as outlined in this IFMP in accordance with the powers granted pursuant to the *Fisheries Act*.

Following the TAC decision, quotas are established for the fleets and special allocation holders that have access to that management area.

Quotas and allocations from 1996 – present can be found in the Profile of Access at ANNEX B.

## 6.2 Harvesting of Northern Shrimp Allocations

When significant quota increases occurred in the Northern shrimp fishery between 1997 and 2016, special allocations were often created to benefit various groups (inshore affected fishers, Indigenous groups, etc.). Over the years, specific harvesting requirements were introduced that determined which fleet is permitted to harvest these allocations and in some cases, specify landing requirements. In 2017, the decision was taken that holders of special allocations in SFA 6 could choose to have their allocation harvested by the inshore fleet and / or the offshore fleet, however arrangements with inshore harvesters would need to occur on a fleet level and not at the individual harvester level in order to address leveraging and other concerns.

**Harvesting Of Northern Shrimp Allocations**

| | | | EAZ | | | | WAZ | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Fleet / Interest | SFA 0 | SFA 1 | DS W | DS E | NU E | NK E | NU W | NK W | SFA 4 | SFA 5 | SFA 6 | Fished Only By: |
| >100' sector | ● | ● | ● | ● | | | | | ● | ● | ● | Any >100' sector Northern shrimp licence holder |
| Nunavut (NU) | | ● | ● | ● | | | | | | | | Any NU temporary or > 100 sector Northern shrimp licence holder with sub-allocations in that area |
| | | | | | ● | | ● | | | | | Those enterprises that receive allocations in these areas, as amended from time to time |
| Nunavik (NK) | | | | | | ● | | ● | | | | |
| | | | ● | | | | | | | | | Any > 100' sector Northern shrimp licence holder or vessel acquired by NK interests |
| Makivik | | ● | | | | | | | | | | Any > 100' sector Northern shrimp licence holder |
| Northern Coalition | | | | | | | | | | ● | | |
| IACF Cartwright to L'Anse au Clair | | | | | | | | | | ● | | Any Canadian wetfish trawler >65' – 99' or > 100' sector Northern shrimp licence holder |
| IACF Northern Peninsula | | | | | | | | | | ● | | |
| Inshore | | | | | | | | | ● | | | < 90' inshore vessel or > 100' sector Northern shrimp licence holder |
| Nunatsiavut Government | | | | | | | | | ● | ● | | |
| NunatuKavut Community Council | | | | | | | | | | ● | | |
| Imakpik Fisheries | | | | | | | | | | ● | | |
| Innu Nation | | | | | | | | | ● | ● | | |
| | | | | | | | | | | | ● | Any > 100' sector Northern shrimp licence holder, and / or through an arrangement with an approved inshore fleet sector |
| St. Anthony Basin Resources | | | | | | | | | | | ● | |
| Fogo Island CoOp | | | | | | | | | | | ● | |
| Inshore Fleet | | | | | | | | | | | ● | Any < 90' inshore licence holder |



In an attempt to encourage development in the early years of the fishery, the Department allowed licence holders to charter foreign vessels to harvest their allocations. This practice was phased out over time and today all vessels in the fishery are Canadian and carry mostly Canadian crews. The exception to this rule is the use of foreign vessels as short term charter replacements to cover exceptional cases such as vessel loss, or in extremely rare cases, when there is a shortage of Canadian vessel capacity.

## 6.3 Percent shares

The Northern shrimp TAC for each of the SFAs 0 to 6 is allocated to the >100' shrimp sector, special allocation holders and the inshore fleet depending on the MU/SFA. Prior to 2016, the LIFO policy was the main tool the Department used to determine access and allocations for each management area, subject to Land Claims considerations. LIFO is described in ANNEX C.

Beginning in 2016, the Department, by Ministerial decision, implemented stable percent shares to remaining allocation holders in each of the southern SFAs (4-6). The Minister modified the percent shares in SFA 4 in 2017 to increase the share of the adjacent Labrador Inuit. Such an approach is not feasible in northern areas where land claims obligations require consideration of any changes in TAC on a case by case basis. Percent shares determine the amount of allocations to participants in SFAs 4, 5 and 6.

| **Fleet / Interest** | **SFA 4** | **SFA 5** | **SFA 6** | **SFA 7*** |
|---|---|---|---|---|
| Offshore (equally divided among >100’ licence holders) | 76.2% | 38.04% | 23.1% | 20.2% |
| Inshore | 5.3% | - | 69.6% | 65.7% |
| Innu Nation | 8.5% | 5.19% | 1.7% | - |
| Nunatsiavut Government | 10% | 9.9% | - | - |
| Northern Coalition** | - | 28.0% | - | - |
| NunatuKavut Community Council | - | 6.22% | - | - |
| Inshore Affected Cod Harvesters (Cartwright to L'anse au Clair) | - | 8.84% | - | - |
| Inshore Affected Cod Harvesters (Northern Peninsula) | - | 1.04% | - | - |
| Imakpik Fisheries | - | 2.77% | - | - |
| St Anthony Resource Basin Inc (SABRI) | - | - | 4.5% | - |
| Fogo Island Co-Op | - | - | 1.1% | - |
| PEI Consortium | - | - | - | 9.4% |
| Miawpukek First Nation | - | - | - | 4.7% |

*Should NAFO take the decision to resume commercial fishing in SFA 7, the quota allocation key will be as described.
** Northern Coalition’s share is divided equally among Labrador Fishermen’s Union Shrimp Company (2 shares), Torngat Fish Producers Coop, Unaaq Fisheries, Qikiqtaaluk Corporation, Makivik Corporation and Nunatsiavut Group of Companies

## 7 MANAGEMENT MEASURES

### 7.1 Total Allowable Catch

Stocks are managed through TAC in each SFA. The TAC is the total amount of shrimp that is permitted to be caught for that fishing season in each SFA, and is determined annually. Generally, the TAC and fleet quotas fluctuate each year by management area. With the implementation of percent shares in SFAs 4 - 6, as the overall TAC changes, the fleet quotas / allocations are adjusted accordingly.

TACs in most management areas are guided according to the harvest decision rules outlined in the Precautionary Approach Framework for Northern shrimp (section 2.6) and include perspectives obtained during consultations with stakeholders as well as other relevant information. For SFA 1, following consultation with relevant stakeholders, Canada adopts an overall TAC (shared between Canada and Greenland), and claims its domestic share based on the formula of 17% of 5/6 of the overall TAC (14.2%) accepted by Canada, recognizing that 1/6$^{th}$ of the area would be inshore waters in Greenland with the remaining 5/6 being offshore areas. There are also specific processes in place to establish TACs and quotas in the WAZ and EAZ which require specific decisions and recommendations from the NWMB and NMRWB. The TAC in SFA 7 is set by NAFO.

The latest TAC announcements can be found at: http://www.dfo-mpo.gc.ca/decisions/index-eng.htm and the Profile of Access at ANNEX B.

## 7.2 Fishing Seasons

The fishing season for the Northern shrimp >100' sector is from January 1 – December 31 for transboundary and NAFO managed stocks (SFAs 0, 1, 3L (SFA 7) and 3M), and April 1 – March 31 for DFO managed stocks, (SFAs EAZ, WAZ, 4, 5, and 6). The inshore trawlers' season is generally from April 1 – December 31, or until the quota is taken, whichever comes first. The opening of the fishery depends on the TAC being announced and for the inshore trawlers, is also based on the sharing of the inshore quota between the 2J, 3K north, 3K south, 3L and 4R fleets. Fishing seasons are regulated under the authority of the Atlantic Fishery Regulations, 1985.

## 7.3 Closed Areas

The following closed areas have been implemented for conservation purposes related to habitat and / or benthic issues, and are regulated through a variation order under the authority of the *Atlantic Fishery Regulations, 1985*.

### 7.3.1 Hatton Basin - Coral Protection Zone

In 2007, the > 100' sector shrimp and groundfish sectors introduced a 12,500 square kilometre (3,644 square nautical miles) Coral Protection Zone in the northern Labrador Sea to protect coral concentrations in that area (see Figure 8). This was part of an industry-led initiative, sponsored by CAPP, the Groundfish Enterprise Allocation Council (GEAC), and the NC, which also includes other conservation measures designed to promote marine stewardship and the preservation of sensitive marine ecological features.

### 7.3.2 Hawke Channel Closed Area

The primary rationale for the closed area was in response to the Fisheries Resource Conservation Council recommendations in 2000 and 2001 to protect juvenile turbot and spawning cod respectively. In 2001, due to concerns about the impact of bottom trawling for shrimp on crab fishing grounds, a proposal for a pilot project involving a "no-trawl" zone was received from the 2J crab licence holders. After consultation with stakeholders and a review of available information, in September 2002, DFO implemented a 400 square nautical mile 'no-trawl/no-gillnetting' study area to conduct work similar to that conducted in Division 3K. The 2J 'no-trawl/no-gillnetting' study area was expanded to cover 2,576 square nautical miles in July 2003 (Figure 8). Since the Hawke Box has been closed, there have been no studies undertaken to determine if the closure is having any effect on cod and turbot populations. Given this lack of substantiated evidence, the Hawke Box closure has been a long standing issue with some industry.

### 7.3.3 Funk Island Deep Closed Area

The Funk Island Deep closed area in SFA 6, was originally closed in 2002 to gillnetting to protect snow crab, and in 2005 the closure was extended to include the inshore shrimp trawlers, with their concurrence. This closed area covers roughly 2,119 square nautical miles and is a voluntary closure for the > 100' sector shrimp trawlers (Figure 8).

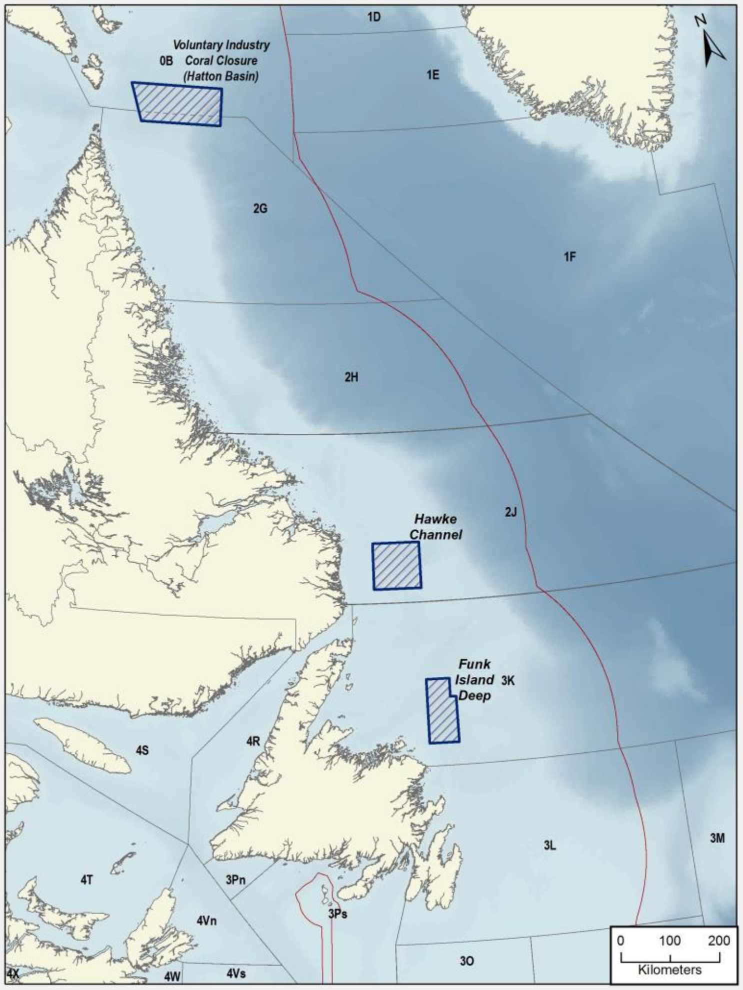


Figure 8 – Fishery Closures

### 7.3.4 Vulnerable Marine Ecosystems Closed Areas (in the NAFO Regulatory Area)

Since 2008, the Northwest Atlantic Fisheries Organization has undertaken extensive scientific research on Vulnerable Marine Ecosystems (VME). This is part of its ongoing commitment to an ecosystems approach to fisheries management and to fulfill its commitment to prevent significant adverse impacts on VMEs as called for by the United Nations General Assembly resolution 61/105.

Following the identification by NAFO of areas identified as VMEs in the NAFO Regulatory Area, fourteen areas have been closed to bottom contact fishing, including two closures that cover a portion of Division 3N to protect significant concentrations of corals and sponges, to prevent the significant adverse impacts of bottom fishing activities on VMEs known to occur or likely to occur. One closed area is in 3K, known as the

Orphan Knoll, where the Northern Shrimp fishery occurs. No vessel shall engage in bottom fishing activities in the following area in Division 3K enclosed by straight lines joining the following points in the order which they are listed:

50 degrees 00 minutes 30 seconds North 45 degrees 00 minutes 30 seconds West
51 degrees 00 minutes 30 seconds North 45 degrees 00 minutes 30 seconds West
51 degrees 00 minutes 30 seconds North 47 degrees 00 minutes 30 seconds West
50 degrees 00 minutes 30 seconds North 47 degrees 00 minutes 30 seconds West

**7.3.5 Inshore Crab Areas Closures**

As a result of concerns about the impact of bottom trawling on Snow crab, at the request of the inshore crab fleets in 3KL the inshore Snow crab fishing areas are closed to all bottom dragging fisheries in SFAs 6 and 7, which includes Northern shrimp fishing by the inshore shrimp trawlers.

- *SFA 6* - Fishing is not authorized in that portion of SFA 6 inshore of a straight line connecting by the following coordinates:

52 degrees 15 minutes North latitude, 55 degrees 26 minutes West longitude to
52 degrees 15 minutes North latitude, 54 degrees 20 minutes West longitude to
51 degrees 20 minutes North latitude, 54 degrees 57 minutes West longitude to
51 degrees 20 minutes North latitude, 54 degrees 20 minutes West longitude to
51 degrees 00 minutes North latitude, 54 degrees 20 minutes West longitude to
51 degrees 00 minutes North latitude, 55 degrees 09 minutes West longitude to
50 degrees 30 minutes North latitude, 55 degrees 30 minutes West longitude to
50 degrees 30 minutes North latitude, 54 degrees 20 minutes West longitude to
50 degrees 10 minutes North latitude, 54 degrees 20 minutes West longitude to
50 degrees 10 minutes North latitude, 53 degrees 20 minutes West longitude to
49 degrees 35 minutes North latitude, 53 degrees 20 minutes West longitude to
49 degrees 35 minutes North latitude, 52 degrees 50 minutes West longitude to
49 degrees 15 minutes North latitude, 52 degrees 50 minutes West longitude.

- *SFA 7* - Fishing is not authorized in that portion of SFA 7 inshore of a straight line connecting by the following coordinates:

49 degrees 15 minutes North latitude. 52 degrees 51 minutes West longitude to
47 degrees 26 minutes North latitude, 52 degrees 03 minutes West longitude to
46 degrees 28 minutes North latitude, 52 degrees 31 minutes West longitude to
46 degrees 12 minutes North latitude, 53 degrees 32 minutes West longitude to
46 degrees 17 minutes North latitude, 53 degrees 32 minutes West longitude to
46 degrees 30 minutes North latitude, 54 degrees 18 minutes West longitude.

**7.3.6 Marine Protected Areas**

The Government of Canada has agreed to domestic and international marine conservation targets (MCTs) to conserve 10% of coastal and marine areas through effectively managed networks of protected areas and 'other effective area-based conservation measures' by 2020 (Aichi Target 11). To further highlight these targets as a priority, the Government of Canada identified an interim target of 5% by 2017.

In support of MCT, a Network of Marine Protected Area (MPAs) and other effective area-based conservation measures (i.e. *Fisheries Act* closures) is currently being developed in the Newfoundland and Labrador Shelves Bioregion to support the conservation and sustainable management of marine resources and their habitats. Within NAFO Divisions 2GHJ3KL there are two inshore MPAs established under the *Oceans Act*. The Gilbert Bay MPA is located on the southeast coast of Labrador in NAFO Subdivision 2J and covers approximately 60 km$^2$. This MPA was designated in 2005 to conserve and protect Gilbert Bay golden cod and its habitat. The Eastport MPA is located in Bonavista Bay in NAFO Subdivision 3L. It was also designated as an MPA in 2005 and covers 2.1 km$^2$. The conservation objective of the MPA is to maintain a viable population of American lobster through the conservation, protection, and sustainable use of resources and habitats; and to ensure the conservation and protection of threatened or endangered species.

Ecologically and Biologically Significant Areas

Within the range of the Northern shrimp fishery, 17 Ecologically and Biologically Significant Areas (EBSAs) have been identified (Figure 9), however division 3L is part of a larger area currently being re-evaluated and could potentially change.

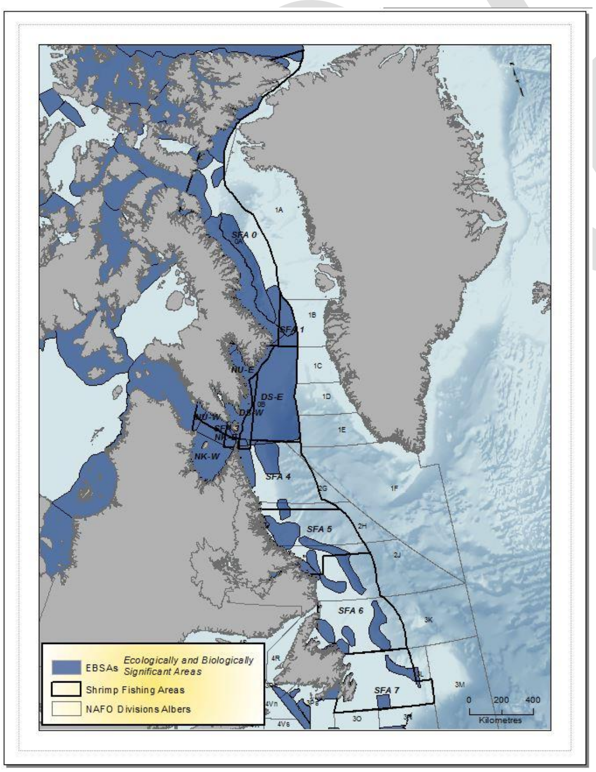


Figure 9: Ecologically and Biologically Significant Areas (EBSAs) located within the range of the Northern shrimp fishery.

EBASs are identified by science and other experts as areas that are particularly important to the structure and function of the marine environment or a particular ecosystem. They are not based on regulation, and are not managed in the way MPAs are managed. Rather, their identification is intended to raise awareness and draw attention to activities that may threaten an area. The identification of EBSAs is a tool for calling attention to areas that have particularly high ecological or biological significance, to facilitate provision of a greater-than-usual degree of risk aversion in the management of activities in such areas.

Further information on these EBSAs can be found in the following documents:

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/ResDocs-DocRech/2007/RES2007_052_e.pdf

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2013/2013_048-eng.pdf
http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2011/2011_055-eng.html
http://www.dfo-mpo.gc.ca/csas-sccs/publications/sar-as/2015/2015_049-eng.pdf

## 7.4 Enterprise Allocations

Enterprise Allocations (EA) are the total quota that each > 100' sector licence holder is allocated in each management area. Quota transfers among allocation holders are permitted in all SFAs, however access to the Nunavut and Nunavik MUs is limited to those entities receiving allocations in these areas, as amended from time to time. EAs also apply to the four inshore licences with allocations in SFA 4. EA is similar to an individual quota. EAs are managed as a condition of licence. The EA Program is described in ANNEX F.

## 7.5 Quota Reconciliation

Quota reconciliation is the process of deducting inadvertent quota overruns from one year to the next, with the enterprise(s) paying for the full allocation, and fishing only that portion remaining after the previous year's overruns have been deducted. This procedure is applied to all sectors participating in this fishery.

Quota reconciliation is not a penalty or sanction; it is an accounting of overruns to ensure that quotas are respected. However, for the inshore fleet, DFO will close fisheries when established quotas are reached or projected to be reached, and those who continue to fish after the closure may be subject to prosecution.

### 7.5.1 >100' Sector Season Bridging

Season bridging was first introduced in 2007. Season bridging refers to a licence holder 1) borrowing from the following year's quota to be fished in the current year; or 2) transferring some of the current year's unused quota to be caught in the following year (carry forward). The ability to season bridge provides the >100' sector harvesters with increased flexibility to better prosecute the fishery and adjust to mechanical problem, weather and ice conditions and resource availability. This policy applies to >100' sector licence holders in Davis Strait East and West and SFAs 4 – 6 without limitation when the stock is in the Healthy Zone. “Without limitation’ means that all 17 licences could carry forward or borrow their permitted amount of quota in the same SFA. Should there be a conservation concern in a particular SFA as evidenced by its positioning in the Cautious zone of the PA framework, season bridging amounts may be capped or suspended in that particular SFA, as has been the case in SFA 6 since 2012.

The >100’ sector licence holders may each carry forward a total of 750t from the previous year’s uncaught commercial quota, with no limitation in any Healthy SFA, that must be fished during the first 90 days (April 1 – June 30) of the new fishing seasons for SFAs 5 and 6, and the first 120 days (April 1 – July 31) for Davis Strait and SFA 4.

Licence holders may borrow up to 500t from the next year’s quota in SFAs 4 – 6 and Davis Strait, with no limitation in any Healthy SFA, to be fished during the last 30 days (March 1 – 31) of the fishing season.

### 7.5.2 Inshore Fleet Season Bridging

Beginning in 2012, Season bridging for the inshore shrimp fleet allowed limited bridging of unharvested quota in SFA 6 from one year to the next, contingent on the stock being in the Healthy Zone. Should there be a conservation concern in a particular SFA as evidenced by its positioning in the Cautious zone of the PA framework, season bridging amounts may be capped or suspended. Fleets have the opportunity to request carry forward prior to the end of the fishing season. Carry forward will be limited to 5% of the inshore fleet’s quota up to a maximum of 1,500t.

## 7.6 Fishing Gear Restrictions

The minimum mesh size authorized while fishing for shrimp is 40mm throughout the otter trawl. The minimum mesh size requirement is regulated through the *Atlantic Fishery Regulations, 1985.*

The otter trawl must be configured with toggle and chain lengths set to a minimum of 71.12cm (28 inches), length measured from the centre of the toggle hole to the fishing line (bolch line) for both > 100’ sector and inshore vessels.

<u>*Nordmore Grate*</u>

As a result of concerns about the level of by-catch of marine mammals, turtle and groundfish species by the small-meshed shrimp trawls and the effect on their populations, an exclusion device known as the Nordmore grate was introduced in the Canadian shrimp fishery in 1993. This device sorts out the larger species, allowing them to escape through an opening in the top of the net, while allowing smaller shrimp to pass through and be retained in the cod-end of the net (Figure 10).

Although grates were not mandatory in the most northern areas prior to 1997, the >100’ shrimp sector had been using them voluntarily in all areas for some time. In 1997, the grate was made mandatory in all areas and is now required in all shrimp trawls, in all SFAs, at all times. The maximum grate spacing for the inshore shrimp trawlers is 22mm.

The >100’ shrimp sector uses a 22mm in SFAs 0, 1, 6, 7, and outside the Canadian Fisheries Waters in 3L, and 28mm grate in the EAZ, WAZ, and SFAs 4 and 5.

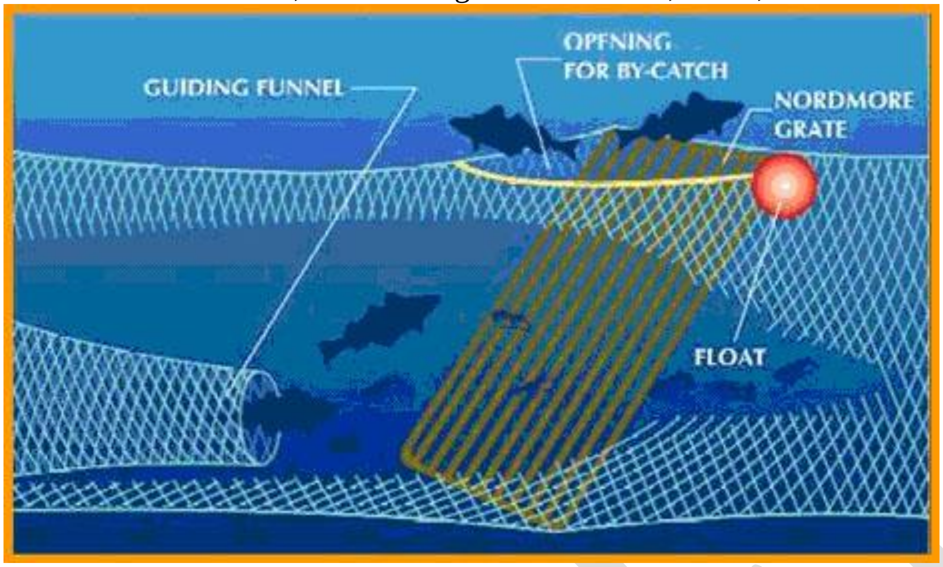


Figure 10 – Nordmore Grate

## 7.7 Incidental Catch

Information on bycatch is obtained by the Department from logbooks completed and submitted by industry, and from observer data. DFO Science compiles data and produces reports and updates.

Minimizing the bycatch of groundfish in all Atlantic fisheries is extremely important given the conservation concerns for the groundfish stocks and the management measures in place for their protection. All shrimp vessels fishing in Canadian waters use sorting grates to separate and release marine mammals, turtles and groundfish (and other finfish) species. Further efforts to minimize by-catch may be required with the listing of additional protected species under the SARA. Closed areas are an additional measure to minimize bycatches and negative interaction with groundfish and other species. In absolute and relative terms, and especially compared to shrimp fisheries in many other parts of the world, bycatches in the Northern shrimp fishery are very low – averaging less than [2%] of the directed shrimp catch by weight.

A number of provisions are employed with respect to incidental catch in the Northern shrimp fishery. These include:

- All incidentally caught species shall be returned to the water from where they were taken and where alive in a manner that causes the least harm.
- In the event that the total incidental catch of all groundfish species in any set exceeds the greater of 2.5% or 100 kg total weight, the licence holder/operator must immediately change the vessel’s fishing area by a minimum of 10 nautical miles from any coordinate during the last tow.

- If total bycatches of capelin in any haul exceed the greater of 5 metric tonnes or 10 percent by weight of the catch of shrimp, the licence holder/operator shall employ active avoidance measures to reduce capelin bycatch. If a subsequent tow is made in the same area within 72 hours of the first tow and the subsequent haul contains bycatches of capelin exceeding 5 metric tonnes or 10 percent by weight of the catch of shrimp, the licence holder/operator must change fishing area by a minimum of 10 nautical miles from any position of that tow. The operator must record in the logbook the active avoidance measures taken in response to the first haul which contains excessive capelin bycatch. The operator must also record in the logbook the position (latitude and longitude) at time of capelin bycatch, as well as the quantity caught by weight in kilograms.

## 7.8 Control and Monitoring of Removals

Access to Northern shrimp stocks is regulated through fishing licences, and measures that include, but are not limited to shrimp fishing area, season, quotas and enterprise allocations, and gear specifications.

At-sea observers monitor for compliance of the management measures including by-catch, discarding and highgrading, gear restrictions, area and closed time provisions. Observers also collect valuable scientific information including size composition, catch, effort, by-catch composition etc. Dockside monitoring by a certified Dockside Monitoring company is conducted on all landings from the inshore fleet. Dockside monitoring of shrimp landed from the >100’ shrimp sector is not required because of the 100% observer coverage.  Completion and submission of accurate fishing log books and fish purchase slips are required.

## 7.9 Quota Monitoring and Bycatch

Catch estimates including bycatch levels are supplied by the licence holder on a daily basis. This is supplied though the completion and submission of a fishing logbook. For vessels >100’, a daily hail on catch is required.

Observers estimate catch and by-catch based on observations of catches within the codend and by estimating the total packout product weight. All shrimp caught must be counted against the quota.

Additional information on compliance protocol for Northern shrimp is at Section 9.

## 7.10 Decision Rules

As described, for each SFA there are rules related to TAC level, gear type, season and closed areas, as well as other limits as outlined in the Northern shrimp condition of licence. Additionally, the PA Framework requires that Harvest Decision Rules are developed that provide details on the harvest rates and possibly other management procedures that are required in each zone, or steps within a zone. These management actions are designed to achieve the desired outcome by affecting the removal rate. For Northern shrimp, the spawning stock biomass is used to determine what PA zone the stock is in – Healthy, Cautious or Critical. Ultimately, the Minister has full authority on setting TACs.

Past management decisions, including TACs, for Northern shrimp can be found here: [http://www.dfo-mpo.gc.ca/decisions/index-eng.htm](http://www.dfo-mpo.gc.ca/decisions/index-eng.htm)

The PA is described in section 2.6, and the Harvest Decision Rules are at ANNEX I.

## <u>7.11 Licencing</u>

The Northern shrimp fishery is a limited entry fishery with no new licences available. Only those who held a licence in the previous year will be eligible for renewal of that licence in the current year. The Minister of Fisheries and Oceans has absolute discretion under the *Fisheries Act* for the issuance of fishing licences. Licences may be reissued to a new licence holder upon the request of the current licence holder. In the case of offshore corporations, only those that have a majority of Canadian ownership are eligible to obtain licences. .Generally, in the inshore fishery, only independent core fish harvesters are eligible to obtain a licence, they may decide to hold this licence in their wholly-owned corporations.

Nunavut sub-allocation recipients receive a temporary licence.

*<u>Additional Inshore Licencing/ Allocation Measures- NL</u>*

- Beam Trawl Licences:
  - 3K and 3L Shrimp beam trawl licences cannot be converted to otter trawl licences,
  - 3K and 3L Shrimp beam licences are not eligible for reissuance.
- SFA 4 Licences:
  - SFA 4 Northern shrimp licences may be reissued to an eligible 3L Independent Core fish harvester who does not currently hold a Northern shrimp licence.
  - Reissuance of SFA 4 Northern shrimp licences to individuals or entities in NAFO Division 2GHJ may be considered.
  - The permanent transfer of allocations from the SFA 4 inshore Northern shrimp fleet to the >100’ shrimp sector is not permitted.
- Other general licencing policy provisions will apply.

<u>Enterprise Combining  & Licence Combining in the Inshore Sector</u>

Enterprise combining is a voluntary fleet self-rationalization policy which allows most shrimp licence holders in Newfoundland and Labrador to acquire Northern shrimp from an enterprise within the same NAFO Division that is exiting the industry; other eligibility provisionsapply. Licence Combining is similar to Enterprise Combining but does not require the enterprise holding the shrimp licence to exit the fishery, all other licences in the enterprise will not be cancelled.  A maximum of four harvest caps may be held by one enterprise, however 3K south based enterprises hold a maximum of five harvest caps; this in order to reach a level of parity with a fully combined 3K north based enterprise Shrimp

Fishing Area 6 Northern shrimp licence. Shrimp beam trawl licences in 3KL and 3L are not eligible for enterprise combining. In addition, inshore enterprise allocations (EAs) in SFA 4 are eligible for combining within SFA 4.

## 7.12 Logbooks & Purchase Slips

Catch estimates including by-catch levels are supplied by the licence holder on a daily basis. This is supplied though the completion and submission of a fishing logbook, either paper or electronic. For vessels >100 ft, a daily hail on catch is required. All shrimp caught must be counted against the quota.

Logbooks are one of the monitoring tools used in this fishery. Under Section 61 of the *Fisheries Act*, all licence holders are required to complete and return logbooks to DFO. Logbooks must be completed accurately, in accordance with instructions provided. Logbook data is vital to both monitoring catch and for the science assessment process. Prompt return of logbooks is vital to ensure all logbook data is available for science assessments in January. The mandatory completion and return of logbook is a condition of licence. Shrimp purchase slips are required to be submitted by processors.

## 7.13 Dockside Monitoring

The objective of the Dockside Monitoring Program (DMP) is to provide accurate, timely, and independent third party verification of landings to ensure the TAC is not overrun, and to ensure licence holders' catches are accurately accounted. DMP constitutes one of the primary sources of landing information on which the management of the inshore fishery is based. The fishing industry and the Department are therefore dependent on the accurate verification of landings by Dockside Monitoring Corporations (DMCs). All DMP costs are the responsibility of individual fish harvesters or fishing fleets. It is also the responsibility of licence holders to ensure that monitors who oversee the offloading of catches are certified by Fisheries and Oceans Canada. The dockside monitoring requirement is managed as a condition of licence.

Dockside monitoring by a certified Dockside Monitoring company is conducted on all inshore fleet landings. Dockside monitoring of shrimp landed from the >100' shrimp sector is not required because of the 100% observer coverage.

## 7.14 At-Sea Observers

The At–Sea Observer Program was designed to collect independent third party fisheries data for science, resource management and compliance and deterrence purposes. This important component of fishery management provides information and an at-sea presence while fisheries are on-going. At-Sea Observers observe, record and report detailed biological and fishery data, such as size composition, catch, bycatch composition, fishing effort and all catch data, fishing gear type, fishing location, discarding and highgrading, gear restrictions, area and closed time provisions, etc.

The fishery is monitored by extensive industry-funded at-sea observer coverage. The >100' shrimp sector and Nunavut temporary licence holders carry 100% observer coverage resulting in approximately 2000 observer days annually. Observer coverage requirement for the inshore fleet is based on a 10% coverage target. Inshore licence holders are required to carry at-sea observers at the request of DFO. Licence conditions are not valid unless a letter of arrangement from the observer company is attached confirming payment of observer fees. The at-sea observer requirement is managed as a condition of licence.

## 7.15 Vessel Monitoring System

As a means to ensure compliance with regulations regarding the area fished, mandatory use of the electronic vessel monitoring system (VMS) was fully implemented in 2004. By utilizing VMS in the fishery there is more accurate, complete and detailed statistical information on the location and timing of fishing activity for DFO Science and Fisheries Management, and improved compliance for restricted areas and more efficient deployments of Conservation and Protection (C&P) resources. VMS includes an automatic location and communication (ALC) device that will transmit the vessel's position to DFO. Fish harvesters are responsible for covering the cost of the ALC device, its installation on-board their vessel, and the cost of operations. The VMS requirement is managed as a condition of licence.

## 7.16 NAFO Regulatory Area

NAFO REGULATORY AREA – The Northern shrimp fishing licence is not valid for operating in the NAFO Regulatory Area (NRA) unless the NAFO Schedule is attached and the licence holder/operator has received a briefing from the Offshore Compliance Unit, NL Region. While operating in the NRA outside Canadian Fisheries Waters, the licence holder/operator shall abide by the NAFO Conservation and Enforcement Measures.

## 7.17 Land Claims Restrictions

Fishing for shrimp is only permitted in the NSA as defined in the Nunavut Land Claims Agreement (NLCA), or in the NMR as defined in the Nunavik Inuit Land Claims Agreement (NILCA) to enterprises that receive allocations in these areas, as amended from time to time.

## 7.18 Species at Risk Act

The *Species at Risk Act* (SARA) came into force in 2003. Under the SARA species may be identified as "at risk". The purposes of the Act are: "…to prevent wildlife species from being extirpated or becoming extinct, to provide for the recovery of wildlife species that are extirpated, endangered or threatened as a result of human activity and to manage species of special concern to prevent them from becoming endangered or threatened." A main issue related to species at risk is the incidental capture of species of Wolffish. Their status as species at risk in Canada results in legal protection and mandatory recovery requirements. Protection under the Act prohibits killing, harming and harassing of individuals and also prohibits damaging or destroying their residence, i.e., protection of critical habitat.

Three species of Wolffish are commonly caught as bycatch. Two species, the Northern wolffish (*Anarhichas denticulatus*) and the Spotted wolffish (*Anarhichas minor*), are listed as "threatened" under SARA and therefore prohibitions apply. Both species have undergone a decline in population size of more than 90% since the late 1970's. For these two species, current management measures, as conditions of licence for the fishery, require that they be returned to the water at the site where they are captured. Release should be done as quickly as possible without harm to the Wolffish in order to maximize the animal's survival, however, dead wolfish must also be returned to the water. A third species, the Striped wolffish (*Anarhichas lupus*), is listed as "special concern" and is also protected under SARA. Conditions of licence require reporting of interactions with wolffish while conducting fishing operations, in the logbook.

To address the condition of these wolffiish species, DFO, in conjunction with industry, fish harvesters and other governmental departments, has developed a *Recovery Strategy for Northern Wolffish and Spotted Wolffish, and Management Plan for Atlantic Wolffish in Canada* that has identified actions to protect and recover these species.

The Species at Risk Public Registry can be accessed at: [http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm](http://www.registrelep-sararegistry.gc.ca/sar/index/default_e.cfm)

### 7.19 Other Inshore Management Measures, NL Region

- All shrimp harvested must be landed
- Freezing of shrimp is not permitted on the vessel during any trip, except the four SFA 4 licence holders
- Mechanical shrimp sorting device are not authorized on board the vessel
- The Licence Holder/Operator shall not fish in more than one Shrimp Fishing Area during the same Shrimp fishing trip, unless there is an At-sea Observer onboard the fishing vessel. If an At-sea Observer is onboard the fishing vessel, the Licence Holder/Operator is authorized to fish multiple Shrimp Fishing Areas during the same trip
- The Licence Holder/Operator shall not fish in more than one Shrimp Fishing Area during the same tow
- Under existing regulations, transport licenses are required to transport Northern shrimp by vessels other than fishing vessels. For the inshore fleet transport licences will only be issued for transporting Northern shrimp that has been landed on shore. Transhipment from inshore fishing vessels is not authorized

## 8 SHARED STEWARDSHIP ARRANGEMENTS

There are mechanisms not based on policy or a regulatory framework that allow the Department to advance conservation aspects of the Northern shrimp fishery.

### 8.1 Working Groups

Working Groups: There are several NSAC Working Groups established to address ongoing issues or resolve one time occurrences. Ongoing working groups include:

- Marine Stewardship Council – aids industry in maintaining their MSC certification, which was achieved in 2008
- Ecosystems – looks at issues such as closed areas, corals and sponges, and other ecosystem related concerns
- Precautionary Approach – established to improve the current PA

- SFA 1 PA – established to develop HDRs and a PA for SFA 1, which is a shared stock with Greenland
- DFO Science / Resource Management / Industry Working Group – established to look at issues and make recommendations to NSAC on issues where Science and Resource Management intersect.

**8.2 Northern Shrimp Research Foundation**

DFO has partnered with the Northern Shrimp Research Foundation (NSRF) to conduct a shrimp survey in SFA 4 and the EAZ since 2005. In 2012, section 10 of the *Fisheries Act* was adopted, which changed the administrative rules around Joint Projects. Beginning in 2014 the NSRF and DFO also worked collaboratively to do the science survey in the Western Assessment Zone. This survey is the only independent source of information of shrimp stocks in these areas, providing the necessary information for determining stock status in the Precautionary Approach Framework and informing decisions on TAC.

Beginning in 2013 and subject to annual Ministerial approvals, a 1,700t allocation of shrimp from SFA 4 has been used to generate the financing required to cover the costs of the Northern shrimp survey pursuant to section 10 of the *Fisheries Act*. For this work, DFO enters into a collaborative agreement with the NSRF to perform the activities. The quota for the surveys was added as a NSRF allocation in SFA 4 and generates proceeds of approximately $1.5 million to fully cover costs of the survey conducted by NSRF.

As per the draft National Policy for Allocating Fish for Financing Purposes, project proponents must demonstrate support (2/3 majority) for both the proposal and the allocation that will be set aside to finance the activity before it is approved by the Department.

**8.3 Closed Areas**

Information on closed areas, including voluntary closures can be found in section 7.3.

**9 COMPLIANCE PLAN**

The Conservation and Protection program promotes and maintains compliance with legislation, regulations and management measures implemented to achieve the conservation and sustainable use of Canada's aquatic resources, and the protection of species at risk, fish habitat and oceans.

The program is delivered through a balanced regulatory management and enforcement approach including:

- Promotion of compliance through education and shared stewardship;
- Monitoring, Control and Surveillance (MCS) activities; and,
- Management of major cases /special investigations in relation to complex compliance issues.

The deployment of Conversation and Protection resources in the northern shrimp fishery is conducted in conjunction with the management plan objectives as well as in response to emerging issues. The mix of enforcement options available and overriding conservation objectives determine the level and type of enforcement activity. The enforcement operational planning process is designed to establish priorities based on management objectives and conservation concerns. The monitoring and evaluation elements of enforcement operational plans facilitate in-season adjustments should conservation concerns and/or significant non-compliance emerge. Additionally, the National Fisheries Intelligence Service (NFIS) is to have a growing role in advising Conversation and Protection programs through intelligence-led, fully integrated, threat-risk based priority setting and decision making practices.

## 9.1 Regional Compliance Program Delivery

Conservation and Protection is responsible for compliance and enforcement work related to all the regional fisheries, as well as habitat, the Canadian Shellfish Sanitation Program, and other activities. Given the magnitude of the task, allocation of time towards a specific fishery is based in large part on an assessment of risk to the resource. In relation to the Northern shrimp fishery, the primary activities conducted by C&P include the following:

- **Education and Shared Stewardship**

Conservation and Protection Supervisors and Area Chiefs will actively participate in annual consultations with the fishing industry and Indigenous organizations. Compliance issues will be presented and recommendations requested for resolution. As well, informal meetings will continue as required to resolve in-season matters.

As part of its activities under the education pillar, C&P will present and discuss fisheries conservation with fishers on a regular basis. The resulting information will be used as part of the planning process within C&P.

- **Monitoring, Control and Surveillance**

C&P promotes compliance with the management measures governing the northern shrimp fishery by the following means:

***Patrols and Inspections:*** C&P Detachments will conduct shrimp patrols by vehicle, vessel, and fixed wing aircraft in accordance with national/regional priorities and operational plan. Detachments will ensure that monitoring and inspections of fish landing activity are carried out.

***Dockside Monitoring:*** The Dockside Monitoring Program (DMP) provides for independent third-party verification of landed catch in metric units by a DFO certified Dockside Observers. DMP is required in the northern shrimp fishery for all landings from <100ft vessels, but is not currently required on shrimp landed from >100ft vessels due to 100% observer coverage.

***Aerial Surveillance:*** Conservation and Protection will ensure that surveillance flights are conducted throughout the season as part of the operational plan. Dedicated air surveillance patrols are conducted in the northern shrimp fishery areas utilizing both Transport Canada and DFO contracted air surveillance aircraft.

***Vessel Monitoring:*** The VMS system will be relied upon to provide real-time data on the location of vessels within this fleet. Utilization of this resource will assist officers in monitoring fishing activity, monitoring closed areas, deploying resources, determining the port of destination and the estimated time of arrival to port. The VMS data will also be relied upon to conduct future analysis and comparisons of fishing activity. Additionally, for more complete coverage, there is an agreement in place with Greenland to share VMS data.

***At-sea Observer Program:*** At-Sea Observers will be deployed in accordance with the established deployment plan to observe record and report aspects of the fishing activity. The resulting data will be utilized to compare reported catch composition of vessels against other available sources of information (DMP, Logbooks, observed trips vs. non-observed trips). There is 100% Observer Coverage for vessels over 100 feet and 10% for smaller inshore vessels, other requirements include daily hails, catch reports and port entry reports.

Fishery Officers will review quota monitoring reports to ensure individual quotas are not exceeded.

## 9.2 Consultation

Shared stewardship and education are achieved in Northern Shrimp Fishery through a renewed emphasis on the importance of C&P communication with the community at large including:

- C&P participation in advisory meetings with Resource Management, other DFO branches and industry to determine expectations in relation to monitoring, control and surveillance activities.
- Presentations to client/stakeholder groups, including school visits or community awareness programs.
- Informal interaction with all parties involved in the fishery on the wharf, during patrols or in the community to promote conservation.
- Internal DFO consultation with Resource Management and other DFO branches to assess the effectiveness of enforcement activities and to develop recommendations for the upcoming season.

## 9.3 Compliance Performance

Post season analysis sessions will be conducted between C&P and Resource Management staff to review issues encountered during the previous season and to make recommendations on improving management measures. The initial sessions will be conducted at the Area level, followed by a regional session that will be held with other sectors.

The C&P program captures and maintains compliance activity information, The following table gives a breakdown of Fishery Officer enforcement effort and compliance results in the shrimp fishery for the past five years.

**TABLE 2 Northern Shrimp- Enforcement Summary**

| | | Violation Break-down | | | | | |
|---|---|---|---|---|---|---|---|
| **Year** | **Fishery Officer Patrol Hours** | **Warning Issued** | **Charges Laid** | **Charges Pending** | **Charges not Approved** | **NAFO Citations** | **Tickets Issued** |
| **2012** | 980.5 | 27 | 6 | 0 | 0 | 0 | 0 |
| **2013** | 815 | 29 | 9 | 1 | 1 | 0 | 0 |
| **2014** | 829.75 | 24 | 5 | 0 | 0 | 1 | 0 |
| **2015** | 686 | 31 | 5 | 5 | 3 | 0 | 0 |
| **2016** | 667.5 | 23 | 1 | 9 | 0 | 0 | 0 |

## 9.4 Current Compliance Issues

Conservation and Protection issues may differ for the >100' sector and the inshore fleet but overall include: fishing gear requirements; quota monitoring; by-catch; highgrading; licence conditions; dockside monitoring requirements; shrimp species verification of borealis or montagui; and, area/time closures.

Compliance concerns in this fishery include fishing closed areas, hail requirements for port entry, bycatch, discards, and misreporting of the species and /or area of capture. The objective to address the issues are to minimize compliance concerns while ensure compliance with the management measures as outlined in the Strategy.

## 9.5 Compliance Strategy

C&P develops operational plans that outline monitoring and compliance activities that will be carried out by C&P personnel adjacent to shrimp management areas. C&P Regions collaborate on the development of these operational plans, both formally (e.g. Northern Operations Committee) and informally. Detachment's will promote effective monitoring and enable personnel to effectively maintain compliance with management measures.

The objectives of the operational plans are to provide a body of information that will provide guidance to C&P personnel, while engaged in monitoring and reviewing of fisheries, to ensure compliance and conduct investigations. Sources of information to be used include vessel positioning data, officer inspection data, fishing logs, DMP records, briefing and de-briefing of observers, and at sea observer records. Operational plans and program results will be routinely assessed to ensure compliance principles are met.

Compliance strategies include:

- Compliance promotion activities with all stakeholders
- Stewardship activities including the NSAC sub-committee on conservation and compliance
- Report-a-Poacher program through crime stoppers
- Scheduled dedicated and multi-tasked air surveillance , and other sea surveillance as per operational requirements
- 100% coverage of At-Sea Observers for the > 100’ sector
- 100% dockside monitoring for inshore vessels, and other dockside checks
- Auditing of landings data
- Investigating non-compliance
- Taking enforcement actions including warnings and prosecutions where noncompliance is detected
- Enforcing Vessel Monitoring Systems (VMS) requirements, including an agreement with Greenland on sharing of VMS data
- Working with other enforcement partners, including Transport Canada (use of surveillance aircraft), Department of National Defence (vessel and surveillance aircraft use, as available) and Greenlandic Fisheries Authorities (exchange of information and best practices).

## 10 PERFORMANCE REVIEW

The Sustainability Survey for Fisheries is completed annually to help DFO self-assess progress towards sustainability, identify gaps in knowledge and practices, and to report externally on performance and progress towards sustainable management of fisheries.

Under multiyear management, every second year NSAC convenes to discuss current science advice, management measures and performance of the fishery. The NSAC meeting is an opportunity for stakeholders to review the fishery, and raise any point or concern and if necessary, propose changes to management that could improve the operations and/ or overall sustainability.

A regular review of the Northern shrimp fishery is conducted at NSAC meetings and includes an assessment of whether the objectives are being achieved and key management issues are being addressed. Stakeholder experience and feedback, information gathered through other evaluation processes and science assessments are used to identify and determine key issues and objectives, as well as potential strategies for achieving outcomes.

## 11. Glossary

*Abundance*: Number of individuals in a stock or a population.

*Age Composition*: Proportion of individuals of different ages in a stock or in the catches.

*Biomass*: total weight of all individuals in a stock or a population.

*Bycatch*: The unintentional catch of one species when the target is another.

*Catch per Unit Effort (CPUE)*: The amount caught for a given fishing effort. Ex: tonnes of shrimp per tow, kilograms of fish per hundred longline hooks.

*Communal Commercial Licence*: Licence issued to Indigenous organizations pursuant to the *Aboriginal Communal Fishing Licences Regulations* for participation in the general commercial fishery.

*Discards*: Portion of a catch thrown back into the water after they are caught in fishing gear.

*Dockside Monitoring Program (DMP)*: A monitoring program that is conducted by a company that has been designated by the Department, which verifies the species composition and landed weight of all fish landed from a commercial fishing vessel.

*Ecosystem-Based Management*: Taking into account species interactions and the interdependencies between species and their habitats when making resource management decisions.

*Fishing Effort*:  Quantity of effort using a given fishing gear over a given period of time.

*Fishing Mortality*: Death caused by fishing, often symbolized by the mathematical symbol F.

*Fixed Gear*: A type of fishing gear that is set in a stationary position. These include traps, weirs, gillnets, longlines and handlines.

*Food, Social and Ceremonial (FSC)*: A fishery conducted by Indigenous groups for food, social and ceremonial purposes.

*Gillnet*: Fishing gear: netting with weights on the bottom and floats at the top used to catch fish. Gillnets can be set at different depths and are anchored to the seabed.

*Groundfish*: Species of fish living near the bottom such as cod, haddock, halibut and flatfish.

*Landings*: Quantity of a species caught and landed.

*Maximum Sustainable Yield (MSY)*: Largest average catch that can continuously be taken from a stock.

*Mesh Size*: Size of the mesh of a net. Different fisheries have different minimum mesh size regulation.

*Mobile Gear*: A type of fishing gear that is drawn through the water by a vessel to entrap fish. These include otter trawls and Danish/Scottish Seines.

*Natural Mortality*: Mortality due to natural causes, symbolized by the mathematical symbol M.

*Observer Coverage*: When a licence holder is required to carry an officially recognized observer onboard their vessel for a specific period of time to verify the amount of fish caught, the area in which it was caught and the method by which it was caught.

*Pelagic*: A pelagic species, such as herring, lives in midwater or close to the surface.

*Population*: Group of individuals of the same species, forming a breeding unit, and sharing a habitat.

*Precautionary Approach*: in fisheries management is about being cautious when scientific knowledge is uncertain, and not using the absence of adequate scientific information as a reason to postpone action or failure to take action to avoid serious harm to fish stocks or their ecosystem. This approach is widely accepted as an essential part of sustainable fisheries management.

*Quota*: Portion of the total allowable catch that a unit such as vessel class, country, etc. is permitted to take from a stock in a given period of time.

*Recruitment*: Amount of individuals becoming part of the exploitable stock e.g. that can be caught in a fishery.

*Research Survey*: Survey at sea, on a research vessel, allowing scientists to obtain information on the abundance and distribution of various species and/or collect oceanographic data. Ex: bottom trawl survey, plankton survey, hydroacoustic survey, etc.

*Species at Risk Act (SARA)*: The Act is a federal government commitment to prevent wildlife species from becoming extinct and secure the necessary actions for their recovery. It provides the legal protection of wildlife species and the conservation of their biological diversity.

*Spawner*: Sexually mature individual.

*Spawning Stock*: Sexually mature individuals in a stock.

*Stock*: Describes a population of individuals of one species found in a particular area, and is used as a unit for fisheries management. Ex: NAFO area 4R herring.

*Stock Assessment*: Scientific evaluation of the status of a species belonging to a same stock within a particular area in a given time period.

*Total Allowable Catch (TAC)*: The amount of catch that may be taken from a stock.

*Tonne*: Metric tonne, which is 1000kg or 2204.6lbs.

*Trawl*: Fishing gear: cone-shaped net towed in the water by a boat called a "trawler". Bottom trawls are towed along the ocean floor to catch species such as groundfish. Mid-water trawls are towed within the water column.

*Validation*: The verification, by an observer, of the weight of fish landed.

*Vessel Size*: Length overall.

*Year-class*: Individuals of a same stock born in a particular year. Also called "cohort".

## ANNEXES

### ANNEX A - History of the Northern Shrimp Fishery

### HISTORICAL OVERVIEW

The Northern shrimp fishery began back in the early 1970s when DFO conducted exploratory cruises that verified the presence of shrimp stocks off Newfoundland and Labrador.

In 1977, four Canadian companies (all with Gulf–based processing facilities) were licensed to prosecute the Labrador shrimp fishery under co-operative arrangements to determine the commercial feasibility of harvesting these stocks.

Landings continued to increase significantly into the 1980s and 1990s, and additional offshore licences were added; by 1991 there were 17, and no additional offshore licences have been issued since this time.

In 1989 the Enterprise Allocation (EA) regime, which was introduced in 1987 on a trial basis was adopted permanently, with the introduction of mandatory, industry paid, observer coverage.

During the early years, many licence holders reduced their risk by using foreign vessels to harvest allocations of Northern shrimp. By 1990, all licence holders were required to use Canadian flagged vessels with Canadian crews to harvest all allocations. The exception to this rule is the use of replacement vessels on a temporary basis.

In 1996, then Minister Mifflin announced that DFO was calling for proposals on principles for the sharing of potential quota increases as the fishery expanded to include inshore and special allocation holders.

In 1996, the >100’ shrimp sector held quota in all SFAs except for SFA 7; these 1996 amounts in each SFA were the thresholds below which sharing to no offshore entities would cease and formed the foundation of the LIFO policy. Additionally, the total 1996 quota (36,700t) was considered an overall threshold, meaning that if a TAC fell below the threshold in one area, it could preclude sharing in another.

In 1997, existing licence holders supported the sharing of quota increases as the fishery opened to other stakeholders.

In 2010, due to a declining biomass in SFA 6, the LIFO principle was triggered for the first time resulting in the complete removal of two special allocation holders. The remainder of the reductions was shared by the inshore and >100’ shrimp sectors at 10% and 90% respectively. The remaining special allocation holders were not affected. With the exception of 2015, LIFO continued to be triggered every year in SFA 5, 6 and / or 7 until it was abolished in 2016, which resulted in the full or partial removal of several special allocation holders.

The reductions and the consequent application of LIFO in 2010 and 2011 lead to an external review of the principles, policies and methodologies used to apply the reductions was carried out by Ernst & Young. They concluded that the Department did correctly interpret and apply the appropriate principles, policies and methodologies to the reductions; however they noted the Department should endeavour to increase communication with stakeholders in the future.

The Northern shrimp fishery first achieved Marine Stewardship Council certification in 2008, and by 2012, the full > 100’ sector and inshore portions of the Northern shrimp fishery attained joint Marine Stewardship Council Certification.

In 2013, the boundaries in the North (SFAs 2 and 3 at the time) were modified to align with scientific surveys and land claim areas. For the first time, allocations were granted to Nunavik proper in the Nunavik Marine Region. The boundary change included new allocations for both species to both Nunavut and Nunavik inside the respective settlement areas, which comprise the WAZ. The management boards representing Nunavut and Nunavik agreed to share the TACs 50/50.

Also as a result of the boundary changes in 2013, new commercial and exploratory allocations for borealis and montagui were created for the Eastern Assessment Zone, and were granted to the >100’ sector, as well as Nunavut and Nunavik. The new TACs and allocations in the EAZ and WAZ are not comparable to 2012 levels or earlier in SFAs 2 and 3.

For the 2013/14 season, 1,700t of the increased TAC in SFA 4 was allocated off the top to the Northern Shrimp Research Foundation survey through the use of fish provision in the *Fisheries Act.* Additionally, a cap of 4,033t was first placed on montagui bycatch in SFA 4.

In 2016, LIFO was replaced by proportional sharing in SFAs 4 – 6, with allocation holders receiving a percent share of the respective TAC. Decisions in the North will be made on a case by case basis considering Land Claims obligations.

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**ANNEX B - PROFILE OF ACCESS**

Need to provide a link\\\

**ANNEX C – Information on the Last In, First Out (LIFO) Policy**

The Last In, First Out (LIFO) principle was a key allocation tool the Department used between 1996 – 2016. LIFO had been described in principle in all Northern shrimp IFMPs since 1997, however the term "LIFO" was first used in the 2003 IFMP. The sharing arrangements and principles agreed to in 1997 formed the basis of LIFO, which recognized the exploratory work and dependence of the offshore fleet. During the late 1990s, when the shrimp stocks continued to increase, the fishery opened up to other participants in SFAs 4 – 6. Participation in northern areas began to expand in 1999.

LIFO was an approach to sharing the changes in TAC depending on the SFA, and was described as follows:

*To ensure the viability of the traditional, >100' shrimp sector was not jeopardized, the 1996 quota levels in each SFA were set as thresholds. Sharing will only take place in a particular SFA if the quota rises above the threshold of that Area. If quotas decline in future years back down to the thresholds, the sharing will end and the new, temporary entrants will leave the fishery. The overall 1996 quota (37,600t) for all Areas combined will also be used as a threshold to determine sharing. Thus a major decline in one or more SFAs could preclude further sharing in any Area. Should there be a decline in the abundance of the resource in the future, temporary participants will be removed from the fishery in reverse order of gaining access – last in, first out. Temporary licences and temporary allocations will only continue as long as the overall threshold level or individual threshold levels are maintained when quotas are set.*

In 2006, DFO announced that additional access to the shrimp fishery would be frozen to encourage stability in the short term. In 2007, the Newfoundland and Labrador's inshore fleets' temporary licences were converted to regular licences to facilitate the rationalization of the inshore shrimp fishery through Enterprise Combining.

LIFO was applied to manage changes in quotas when the TAC fell to a range  below the threshold for that SFA. . When this occurred, special allocation holders were removed first from the fishery, with the remainder of the reductions shared among the > 100' sector and inshore fleet according to prearranged sharing formulas, (proportional to how quota increases had been received) , which varied by SFA.

A special allocation was a maximum amount for that group at that TAC level or greater, with the premise that the special allocation holder entered the fishery at the *previous* TAC level, at which point their allocation would have been 0. Therefore, the LIFO policy recognized that a special allocation holder would hold a proportional level of quota if the TAC was between these two levels.

Beginning in 2010, decreases began occurring in the southern range of the Northern shrimp fishery, triggering the LIFO policy each year in one or more SFAs. LIFO was applied in 2010 and 2011 in SFA 6. In 2012, LIFO was applied in SFA 6 as a proportionate increase and in SFA 7 as a proportionate decrease. In 2013, LIFO was applied to reductions in SFAs 5 and 6. In 2014, the TAC and all allocations were fully reinstated in SFA 5.

In terms of LIFO, SFA 7 was unique in that the fishery began in 2000, after the LIFO thresholds were announced in 1997. Three allocation holders entered the SFA 7 fishery at the same time, unlike the other SFAs, and therefore no threshold existed. However, to be consistent with the management measures in other SFAs, the same principles applied governing access and allocations in SFA 7. By 2014, the TAC in SFA 7 fell to a level at which the Miawpukek First Nation held no quota, leaving only the original three stakeholders; their quotas were reduced to the same proportions as when they first entered the fishery. Beginning in 2015, the SFA 7 fishery was closed to commercial fishing.

**<u>Independent Review</u>**

The 2010 and 2011 application of LIFO to the reductions in SFAs 6 and 7 led to several stakeholders in the fishery criticizing the Department's approach publicly and at NSAC meetings. An independent reviewer (Ernst & Young) was tasked with analyzing whether the policies, methodologies and principles on applying TAC reductions amongst fleets and special allocation holders were respected and appropriately applied to the decision making process for Northern shrimp. Stakeholder participation in the review was high, with all relevant stakeholders in the fishery, including the > 100' sector and inshore fleet, special allocation holders, provincial and territorial governments and agencies, and relevant land claims Management Boards and Inuit organizations, were provided the opportunity to participate in the process through interviews, open forum discussions, conference calls, meetings and/or written submissions.

The final report determined that the appropriate departmental policies, principles and methodologies were used in both the TAC reductions that occurred in SFA 6 and with the application of the LIFO principle as it is defined. It also recommended increased transparency in the establishment of policies and principles and in their application and interpretation.

More information on the independent review can be found at http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/reports-rapports/eap-pce/index-ns-cn-eng.htm

## Ministerial Advisory Panel (MAP)

LIFO remained a highly contentious issue with varying perspecitives from stakeholders especially when reductions were first applied in 2010. Given the complexity of the issue and need for a broad range of expertise, a Ministerial Advisory Panel (MAP) comprised of four individuals was appointed by the Minister in April 2016, tasked with providing advice on whether the LIFO policy specific to the Northern shrimp fishery should be continued, modified or abolished.

The MAP operated as an independent, external body, however the Department provided operational and logistic support to their process. The MAP held five public stakeholder meetings in Newfoundland and Labrador, and one each in Iqaluit and Halifax. It received 41 written submissions and over 100 in-person presentations in an open and transparent process. All relevant interests in the fishery participated in the review.

In the final report delivered to the Minister in June, 2016, the MAP concluded that LIFO was not a sustainable instrument of public policy. Their principle recommendation was that LIFO should be replaced by proportional percent shares. The recommendation to move to percentage shares was approved by the Minister after additional NSAC consultations with stakeholders on the abolishment of LIFO in SFAs 4 – 6. Percent shares allow for increased predictability in allocations, and for participants to share equitably in any changes in TAC. In the northern SFAs, proportional percent shares were not implemented, rather access and allocation decisions will continue to be made through the appropriate consultative processes in a manner consistent with the Land Claims Agreements, on a case by case basis.

In establishing the percent shares for the southern areas, adjacency, fairness and Indigenous access were among the key considerations for the Department.

Information related to the MAP process, including Terms of Reference, written submissions, supplementary MAP recommendations and the MAP's final report and conclusions can be accessed at:

http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/shrimp-crevette/shrimp-crevette-eng.htm

**ANNEX D Northern shrimp licence holders and their representative organizations**

| Year Issued | # of Licences | Licence Holder | Representative Organization |
|---|---|---|---|
| 1978 | 2 | Labrador Fishermen's Union Shrimp Co. Ltd. | Northern Coalition (NC) |
| 1978 | 2 | Ocean Choice International Inc., | Canadian Association of Prawn Producers (CAPP) |

| | | | |
|---|---|---|---|
| 1978 | 2 | Mersey Seafoods Ltd.,<br>, | CAPP |
| 1978 | 1 | M.V. Osprey Ltd, | CAPP |
| 1978 | 1 | Crevettes Nordiques, | CAPP |
| 1978 | 1 | Atlantic Shrimp Co. Ltd., | CAPP |
| 1978 | 1 | Torngat Fish Producers Coop Society Ltd., | NC |
| 1978 | 1 | Caramer Ltd.,<br>, | CAPP |
| 1979 | 1 | Makivik Corp, | NC |
| 1987 | 1 | Pikalujak Fisheries Ltd., | independent |
| 1987 | 1 | Qikiqtaaluk Corporation,<br>, | NC |
| 1987 | 1 | Harbour Grace Shrimp Co., | CAPP |
| 1987 | 1 | Unaaq Fisheries Inc., | NC |
| 1991 | 1 | Newfound Resources Ltd. | CAPP |

**ANNEX E -** Coordinates of the Fishery

Subject to conditions of licence, and not including closed area coordinates, the waters of the management units in which fishing for shrimp is permitted are:

(a) In the waters of Management Unit 0: Canadian Fisheries Waters in Davis Strait and Baffin Bay that lie north of latitude 66°15’N, south of latitude 78°10’N, west of longitude 60°30’W, and east of longitude 80°W.

(b) In the waters of Management Unit 1: Canadian Fisheries Waters in Davis Strait and Baffin Bay that lie north of latitude 66°15’N and east of longitude 60°30’W.

(c) In the waters of Management Unit **Davis Strait East (DS E):** between 61°N and 66°15’N, east of 63°W and east of the Nunavut Settlement Area.

(d) In the waters of Management Unit **Davis Strait West (DS W):** between 60°30’N and 66°15’N west of 63°W and east of the Nunavut Settlement Area and Nunavik Marine Region.

(e) In the waters of Management Units Nunavut East (NU E) and/or Nunavik East (NK E): the area inside the Nunavut Settlement Area east of 66°W; and the area inside the Nunavik Marine Region east of 66°W and north of 60°30'N. Access to the NSA or the NMR is limited to those enterprises which have been allocated quotas in these areas, which is amended from time to time.

(f) In the waters of Management Units Nunavut West (NU W) and/or Nunavik West (NK W): the area inside the NSA bounded by 70°W and 66°W; and the area inside the NMR bounded by 70°W and 66°W to 60.30°N. Access to the NSA or the NMR is limited to those enterprises which have been allocated quotas in these areas, which is amended from time to time.

(g) In the waters of Management Unit 4: Canadian Fisheries Waters adjacent to the Coast of Labrador that lie north of latitude 57°15'N, south of latitude 61°00'N excluding that portion north of 60.30N, east of the Nunavik Marine Region and Nunavut Settlement Area and west of 63W longitude.

(h) In the waters of Management Unit 5: Canadian Fisheries Waters adjacent to the Coast of Labrador that lie north of a line drawn from shore at latitude 53°45'N, east to longitude 55°00'W, thence north to latitude 54°45'N, thence east to the outer limits of Canadian Fisheries Waters and south of latitude 57°15'N.

(i) In the waters of Management Unit 6: Canadian Fisheries Waters adjacent to the Coast of Southern Labrador and Northern Newfoundland that lie north of latitude 49°15'N and south of a line drawn from shore at latitude 53°45'N, east to longitude 55°00'W, thence north to latitude 54°45'N, thence east to the outer limits of Canadian Fisheries Waters.

## ANNEX F - NORTHERN SHRIMP ENTERPRISE ALLOCATION PROGRAM

### Establishment and Utilization of Enterprise Allocations

Access and quotas allocated to > 100’ sector licence holders are known as enterprise allocations (EA), and those licence holders shall participate equally in such access and quotas.

EAs shall be based on the Total Allowable Catch (TAC) established for the respective Northern Shrimp Fishing Areas.

EAs to individual licence holders will be in the form of “licence quotas” which are equal allocations of shrimp expressed in absolute amounts or tonnages.

>100’ sector licence holders will have equal access to all Northern shrimp stocks and fishing areas for which the sector has EAs (SFAs 0, 1, 4-6 and MUs Davis Strait. The EA for each licence, for each SFA, is determined by dividing the quota set for the >100’ sector in that SFA by seventeen (the number of > 100’ sector licences in the fishery).

### Administrative Guidelines for Enterprise Allocations in the Northern Shrimp Fishery

1. No permanent transfers of EAs between enterprises are permitted.

2. Inter-enterprise transfers of EAs are permitted on a temporary basis. Quota is freely transferable between and within enterprises provided that:
    - the transfer applies only to the current season;
    - notification of the transfer registered in the EA Temporary Transfer System (EATTS)
3. Licence holders will have 30 days following the end of the fishing season to complete transfers in order to cover any inadvertent overruns of their EAs.

## ANNEX G - NORTHERN SHRIMP ADVISORY COMMITTEE MEMBERSHIP AND TERMS OF REFERENCE

### CHAIR

Director General, Resource Management Operations, DFO – Ottawa or by another representative of Fisheries and Oceans Canada.

### MEMBERS

Atlantic Shrimp Company Ltd.
Baffin Fisheries Coalition
Canadian Association of Prawn Producers (CAPP)
Caramer Limited
Crevettes Nordiques Ltée.
Imakpik Fisheries
Ocean Choice International
Harbour Grace Shrimp Company Ltd.
Labrador Fishermen's Union Shrimp Company
Nunatsiavut Government
Makivik Corporation
Mersey Seafoods Ltd.
M.V. Osprey Ltd.
Newfound Resources Ltd.
Northern Coalition
NunatuKavut Community Council
Nunavut Offshore Allocation Holders Association (NOAHA)
P.E.I Atlantic Shrimp Corp.
Pikalujak Fisheries Ltd.
Qikiqtaaluk Corporation
Torngat Fish Producers Cooperative Society Ltd.
Unaaq Fisheries Inc.
Department of Fisheries, Aquaculture, and Environment P.E.I.
Department of Environment, Government of Nunavut
Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec
New Brunswick Department of Agriculture, Fisheries, and Aquaculture
Newfoundland and Labrador Department of Fisheries and Land Resources
Nova Scotia Department of Agriculture and Fisheries
DFO - Newfoundland and Labrador Region

DFO - Quebec Region
DFO - Maritimes Region
DFO – Gulf Region
DFO - Central and Arctic Region
DFO – Ottawa NHQ
Nunavut Wildlife Management Board
Nunavik Marine Region Wildlife Board
Nunatsiavut Government
Torngat Joint Fisheries Board (TJFB)
Association of Seafood Producers (ASP)
Fish, Food and Allied Workers Union (FFAW)
Fogo Island Co-operative Society
Innu Nation – Labrador
Qikiqtani Inuit Association
Nunavut Tunngavik Inc
Regroupement des Associations de Pêcheurs de la Basse Côte Nord
St. Anthony Basin Resources Inc. (SABRI)
One representative from each FFAW inshore fleet - 2J, 3K north, 3K south, 3L, 4R, and the Association des Capitaines Proprietaires de la Gaspésie

**PURPOSE**

The Northern Shrimp Advisory Committee (NSAC) serves as a forum for the discussion of issues on the management and development of the Northern shrimp fishery providing advice and recommendations to the Minister of Fisheries and Oceans.

**SCOPE**

NSAC will provide input on Integrated Fisheries Management Plans respecting Northern shrimp, including but not limited to advice on:

- quota allocations and other regulatory measures (such as seasons, size limits and gear restrictions) and amendments thereto;
- conservation and compliance issues; and
- licencing policy.

**MEMBERSHIP**

Membership on the NSAC shall be limited to:

- one representative of each company that holds a >100’ sector Northern shrimp fishing licence;
- one representative of each area and fishers receiving special allocations or holding inshore fishery licences;
- one provincial or territorial or land claim-government representative from each of New Brunswick, Newfoundland and Labrador, Nova Scotia, Prince Edward Island, Quebec, Nunavut Territory, Nunatsiavut and Nunavik Inuit ,

- one representative of recognized industry associations/groups
- representatives from Fisheries and Oceans Canada.

**PROCEDURES**

No formal voting procedures will be entrenched in the conduct of the NSAC; rather it will seek to operate on a consensus basis.

Meetings will be convened at dates and times agreed upon by the chair and there will be at least one meeting every second year. The NSAC may determine that additional meetings are necessary and request the chair to make arrangements accordingly. The chair shall be responsible for notifying all members of any meeting.

The chair shall establish, in consultation with the NSAC members, agenda items for NSAC meetings. These items will be subject to the consensus of NSAC members at the commencement of each meeting.

Ad hoc working groups may be established by the NSAC to review specific issues and report their findings to NSAC as a whole.

If a member cannot attend an NSAC meeting, that member may nominate an alternate by notifying the chair as far in advance of the meeting as possible.

Non-members may attend NSAC meetings. They may not sit at the table but can participate in discussions following input from members.

**ADMINISTRATION**

Summary minutes of each meeting will be prepared in both official languages (French and English). The summary minutes will be distributed by the Department of Fisheries and Oceans after they are reviewed and accepted by the chair. Minutes of NSAC meetings can be found at: http://www.dfo-mpo.gc.ca/reports-rapports-eng.htm#3

## ANNEX H – Stock Assessment and Precautionary Approach Framework

Stock Assessment and Precautionary Approach

The Science Advisory Reports for northern shrimp are available on the DFO Canadian Science Advisory Secretariat website:

An assessment of Northern Shrimp (*Pandalus borealis*) in Shrimp Fishing Areas 4-6 and of Striped Shrimp (*Pandalus montagui*) in Shrimp Fishing Areas 4 in 2016: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_012-eng.html

Assessment of Northern Shrimp, *Pandalus borealis*, and Striped Shrimp, *Pandalus mondagui*, in the Eastern and Western Assessment Zones, February 2017:

http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2017/2017_010-eng.html

SFA 7 is assessed and managed by the Northwest Atlantic Fisheries Organization (NAFO). NAFO 0 + 1 is assessed by NAFO but managed independently by Canada and Greenland. Science advice can be found on the NAFO website:

In order to find the advice for SFA 7, follow the link below and click on Scientific Advice and then NAFO Stocks. The information for SFA 7 is located in the link entitled: Northern Shrimp in Div. 3LNO.
http://www.nafo.int/science/nafo-stocks.html

In order to find the advice for NAFO 0 + 1, follow the link below. The information for NAFO 0 + 1 is located in the link entitled: Northern shrimp in SA 0+1.
http://www.nafo.int/science/coastal.html

## ANNEX I : Harvest Decision Rules SFA 4 – 6, EAZ, SFA 1

Harvest Decision Rules (HDRs) SFA 4 – 6, EAZ

The following provisional rules are to be used when setting TACs.

**When SSB is Above the Upper Stock Reference (USR):**

- Measures should generally promote the SSB remaining above the URP.
- The base target exploitation rate will be 15% of exploitable biomass. This rate can increase gradually, particularly as an artifact of a stable TAC strategy applied during a time of declining SSB while in this zone, subject to monitoring/signals that excessive fishing mortality is being exerted on the stock.
- The exploitation rate should not exceed FMSY, a level that is yet to be calculated, but is thought to be well above the base target exploitation rate. Changes in the TAC should generally not exceed 15% of the previous TAC, unless the stock is declining precipitously.
- Government should not facilitate any increase in industry capacity/infrastructure during any period.

**When SSB is between the Limit Reference Point (LRP) and the Upper Stock Reference (USR) (i.e. in the Cautious Zone):**

- Measures should generally promote the SSB rebuilding towards the URP, subject to natural fluctuations that may be expected to occur in biomass and survey results.
- If SSB is in the upper half of the Cautious Zone, the exploitation rate should not exceed 2/3 FMSY, thought to be significantly above 15% of exploitable biomass
- If SSB is in the second lowest quadrant of the Cautious Zone, the exploitation rate should not exceed 1/2 FMSY, thought to be above 15% of exploitable biomass

- If SSB is in the lowest quadrant of the Cautious Zone, the exploitation rate should not exceed 15% of exploitable biomass
- The TAC should not be increased if the SSB is projected to decline or is within a declining trend
- Changes in the TAC should generally not exceed 15% of the previous TAC, unless the stock is declining precipitously.

**When SSB is Below the Limit Reference Point (LRP):**

- Measures must explicitly promote an increase in the biomass above the LRP within 6 years of falling below the LRP.
- Any fishing mortality must be in the context of a rebuilding plan, and should not exceed 10%.

## Harvest Strategy SFA 1

### Preamble

Shrimp Fishing Area (SFA) 1 is the Canadian management unit that is part of a trans-boundary stock that is harvested and managed separately by both Greenland and Canada. While an agreement with respect to TAC-setting or quota shares has not yet been reached, there is full cooperation with respect to scientific research, surveillance and enforcement, and a full exchange of information between the two jurisdictions. Both States refer to the NAFO/ICES Pandalus Assessment Group (NIPAG) for formal scientific advice, which is provided annually. The stock is assessed as a single population.

### Stock Assessment

The assessment framework incorporates a logistic stock-recruit model, fitted by Baysian methods, that uses CPUE and survey series as biomass indicators, and includes as removals catch data, assumed free of error, as well as a term for predation by Atlantic Cod, using available series of cod biomass. The model is used to provide short term (1 year) and medium term (5 year) projections.

### Stock Status deficiencies

After a decade of increasing biomass and expanding distribution in the 1990's, both the biomass and the fishery have contracted back towards the north. Fishable biomass has declined since its 2003 peak, but is currently estimated to remain above Bmsy; the risk of being below Blim (30% of Bmsy) is very low (<1%).

### Harvest Decision Rules (HDRs)

Preamble

In the absence of a TAC-setting and quota-sharing agreement with Greenland on this trans-boundary stock, the approach outline below will be taken by Canada. Reference points and scientific advice are based on a quantitative assessment model and stock composition indices as articulated by the Scientific Council (SC) of the Northwest

Atlantic Fisheries Organization (NAFO). Previous work by the SC has shown that a maintained mortality risk of 35% is low enough to keep stock levels safely at or above $B_{MSY}$.

The Harvest Strategy will remain in place until such time that Canada and Greenland may adopt common Harvest Decision Rules.

<u>Objectives</u>

- Achieve/maintain the stock in the Healthy Zone (>80% of $B_{MSY}$)
- Avoid serious harm to the reproductive capacity of the stock by maintaining biomass >30% of $B_{MSY}$
- Avoid total removals in excess of maximum sustainable yield
- Manage the TAC and quotas to facilitate a balance of opportunity and stability in the industry, subject to the need to respond to precipitous biomass declines
- Maintain Canada's quota share of this trans-boundary stock.

<u>Reference Points</u>

- Healthy Zone = >80% of $B_{MSY}$
- Cautious Zone= >30%Bmsy and < 80% $B_{MSY}$
- Critical Zone is <30%Bmsy
- Limit Reference Point for biomass (Blim) = 30% of $B_{MSY}$

Limit Reference Point for total mortality = $Z_{MSY}$

<u>Harvest Decision Rules (HDRs)</u>

The Canadian quota will be 17% of 5/6 of the TAC designated by Canada, or 14.2% of the entire designated TAC.

- When the biomass is above 80% of $B_{MSY}$, the risk of being above $Z_{MSY}$ should be less than 35%, based on the 3-year projections.
- When the biomass is between 30-80% of $B_{MSY}$, the risk of being above $Z_{MSY}$ based on the 3-year projections should not exceed 17-35%, with the risk tolerance being lower the closer the biomass is to Blim, with 17% at the lower end and 35% of the upper end of this range.

- If the biomass is below the Healthy Zone and approaching Blim (middle of the cautious zone) then a special meeting will be sought with Greenland to develop actions that endeavor to mitigate or reverse the decline (e.g. a rebuilding plan). In the absence of agreement on measures to be taken, special conservation measures may be taken unilaterally by Canada.

<u>Notes:</u>

- Biomass refers to fishable biomass as calculated by the assessment model. Biomass values are to be based on point estimates.

- Precipitous decline: When the biomass decreases by more than 25% in the cautious zone; a special NSAC discussion will be held to evaluate all available biomass signals and the recent stock trend to determine if special conservation measures are required and/or consultations with Greenland on appropriate measures will be triggered
- Canadian quotas that are uncaught in one year may be carried forward to the following year in accordance with criteria and levels to be agreed between DFO and quota holders as long as the harvest level is consistent with the HDRs above.
- These HDRs are subject to change as Canada further develops guidance on the application of the PA framework on its domestic fisheries. This could include rules that provide stability in TAC (i.e. a maximum and minimum percentage change).

## ANNEX J- NORTHERN SHRIMP RESEARCH – Provisional and Subject to change

**On-going Research (as of 2016):**

- In SFAs 5, 6 and 7, continue with the autumn DFO survey in 2HJ3KLNO, and the spring DFO survey in 3LNOPsn.
- In SFA 4, WAZ and EAZ continue with summer DFO-NSRF survey on an annual basis in order to determine and update shrimp biomass indices. Also, continue to collect data on environmental covariates with the intent of developing relationships with the shrimp distribution.
- In WAZ, DFO will attempt to analyze spatial/temporal variability of shrimp distribution. Two cruises, in addition to the annual DFO-NSRF survey, will be performed to study seasonal variability in shrimp biomass distribution.
- Continue to conduct genetic analysis to delineate stock assessment area(s), especially for use in modeling. Preliminary results from completed work indicate shrimp are genetically similar along the eastern coasts of NL (SFAs 4-7).
- Continue efforts to develop age-length keys for Northern Shrimp.
- Continue efforts to develop an assessment model.
- Continue to gather and analyze information related to corals, sponges and other vulnerable marine ecosystems.
- Continue to analyze trends in the fish community (including shrimp).
- Continue diet studies of major groundfish species (predators of shrimp).

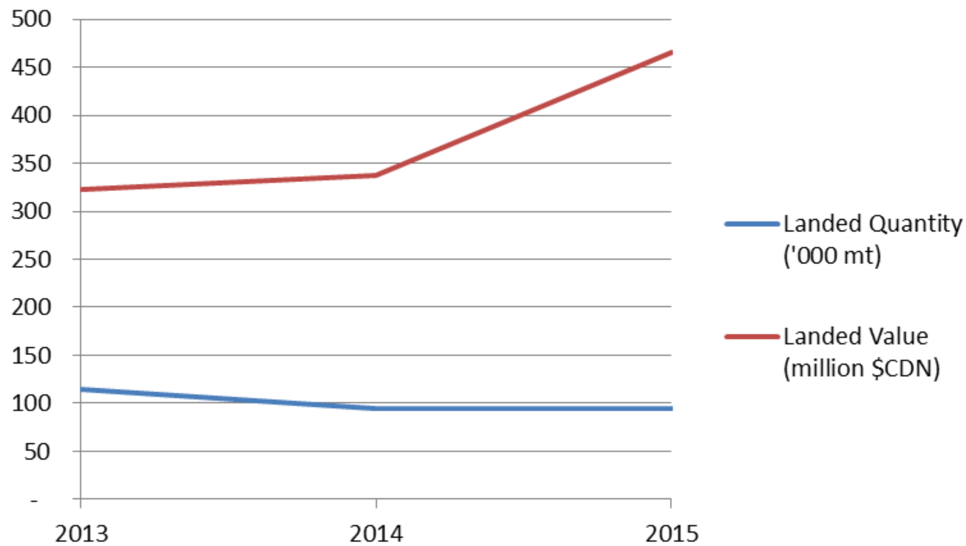
**Potential Future Research**

- Conditional on the development of an accepted assessment model, to begin a Management Strategy Evaluation in order to develop modeled harvest decision rules.
- To determine trophic level for key species (including shrimp) using diet composition and stable isotopes.
- To develop fisheries production potential models.
- To analyze relationships between shrimp catch survey results and measured environmental covariates to seek potential linkages (responses) of the stock to large scale oceanographic variability.

Explore relationships/correlations between groundfish and shrimp, including various size classes of both, from available survey data.

ANNEX K – Economic Information

*Canadian Northern Shrimp Fishery, Total Domestic Landings, 2013-2015*[3]

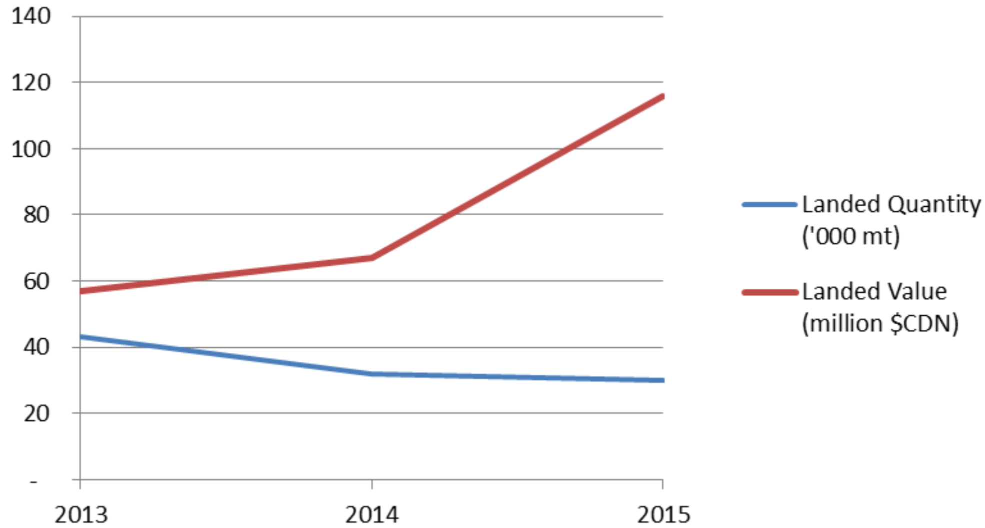



**Inshore Fleet Landings**

Annual landed quantities by the inshore fleet declined 30% between 2013 and 2015 in parallel with TAC declines, while annual landed value more than doubled (Figure X). Annual average landed prices for unprocessed shrimp increased by 191% from $1.33/kg in 2013 to $3.87/kg in 2015. Cumulatively, from 2013 to 2015, the inshore fleet's landed quantities accounted for 34% of the total taken from the Northern shrimp fishery.

[3] Data source: Canadian Atlantic Quota Reports

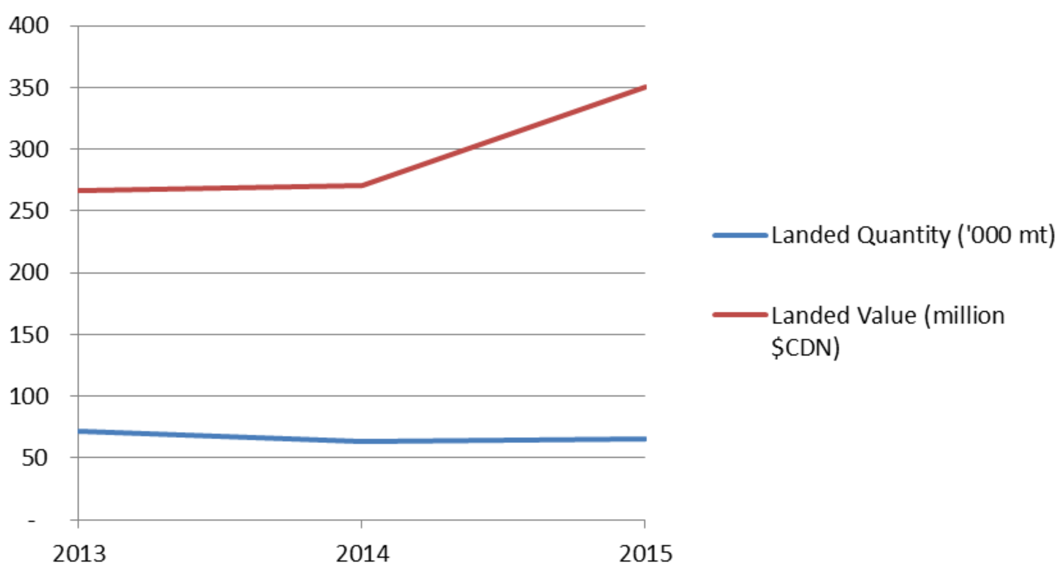
*Figure X: Canadian Northern Shrimp Fishery, Inshore Fleet Landings, 2013-2015*




**100' Fleet Landings**

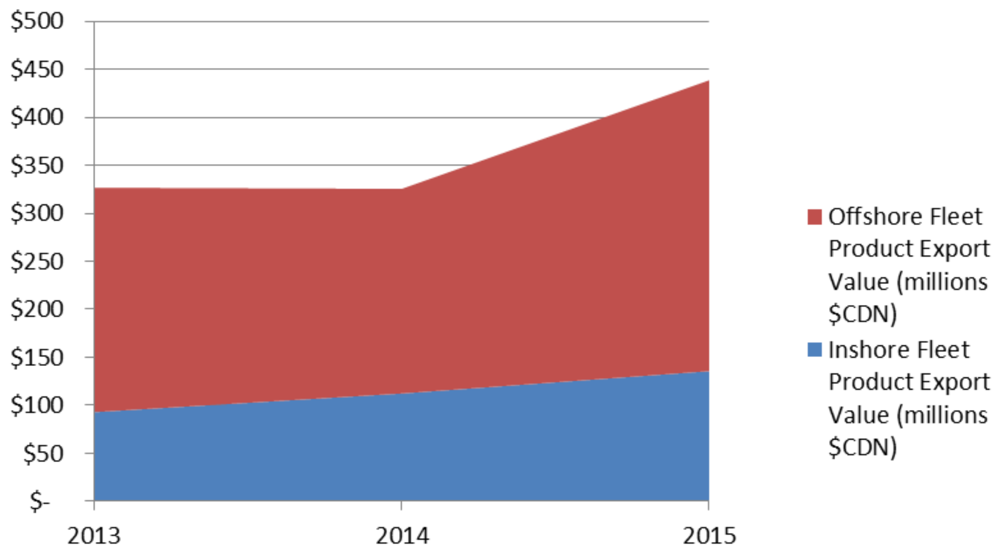
Annual landed quantities by the >100' fleet, which include quotas from special allocations, declined 10% from 2013 to 2015 in parallel with TAC declines, while annual landed values increased by 32% (Figure X). Increases in annual landed values were primarily driven by year-over-year increases in the annual average landed price. For the majority of landings, average landed prices for the >100' fleet product, which is processed at sea, increased 46% from \$3.69/kg in 2013 to \$5.38/kg in 2015. Cumulatively, from 2013 to 2015, the >100' fleet's landed quantities accounted for 66% of the total taken from the Northern shrimp fishery.

*Canadian Northern Shrimp Fishery, >100' Fleet Landings, 2013-2015*



Exports[4][5]

*Canadian Northern Shrimp Export Value 2013-2015*






**Inshore Fleet Exports**

The inshore fleet focuses on the cooked and peeled product, which is processed on shore. The market for this product is predominately Europe. Annual exports of Canadian cooked and peeled product of Northern shrimp averaged 11,000 mt from 2013 to 2015, with an annual average value of $114M (Table 1). Canada's main destinations for this product are the United Kingdom, Denmark, and the United States, accounting for 59%, 23% and 9% respectively, of total cooked and peeled product shrimp export value in 2015.

*Northern Shrimp Inshore Fleet Product Exports, 2013-2015*

| | 2013 | 2014 | 2015 |
|---|---|---|---|
| Quantity ('000 mt) | 12 | 12 | 10 |
| Value (millions $CDN) | 93 | 112 | 135 |

**100' Fleet Exports**

The >100' fleet focuses on a frozen at sea, shell-on product (cooked or raw). The product has strong markets in Asia and Western Europe. Annual export volumes of Canadian frozen shell-on Northern shrimp averaged 58,000 mt from 2013 to 2015, valued at $250M annually (Table 2). The >100' fleet's product was largely exported to China,

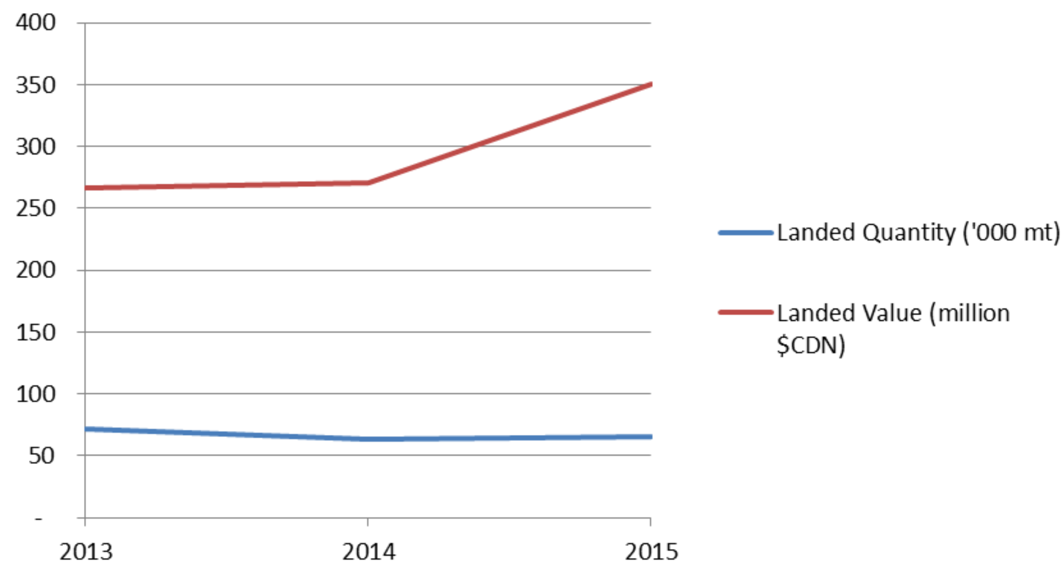
[4] Source: DFO EXIM Trade Database: Statistics Canada, International Trade Division.

[5] Export data presented in this section may include a small amount of Gulf of St. Lawrence shrimp exports since these are captured in the same Harmonized System (HS) export codes. Inshore fleet exports include products exported directly from Newfoundland and Labrador. A small amount of inshore exports may be excluded due to transprovincial shipment prior to international export.

Denmark and Iceland, accounting for 41%, 18% and 17% respectively of Canada's total frozen shell-on shrimp export value in 2015.

***Northern Shrimp >100' Fleet Product Exports, 2013-2015***

| | 2013 | 2014 | 2015 |
|---|---|---|---|
| Quantity ('000 mt) | 65 | 53 | 57 |
| Value (million $CAN) | 234 | 213 | 303 |




Employment

Approximately 200 inshore NL vessels harvest shrimp, with each vessel having at least five crew members plus the captain onboard. Additionally, between 2013 and 2015 the inshore fleet supplied shrimp to 10 processing plants, resulting in onshore employment to approximately 2,000 people. The >100' shrimp sector licence holders double-crew their vessels (24 to 28 crew depending on the size of the vessel) employing approximately 520 crew for the entire fleet. The Northern shrimp fishery also provides indirect employment for goods and service providers that support harvesting, processing and distributional activities.

# SUBMISSION TO THE NUNAVUT WILDLIFE MANAGEMENT BOARD November 2017

**FOR**

**Information: X** **Decision:**

**Issue:** Fisheries and Oceans Canada Update – *Oceans Act* Marine Protected Areas

**Updates:**

In June 2016, Canada announced a five-point plan to reach its national and international marine conservation targets (MCTs), which includes the establishment of additional Marine Protected Areas (MPAs). The purpose of establishing MPAs is to afford protection to important fish and marine mammal habitats, endangered marine species and their habitats, unique features, and/or areas of high biological productivity or biodiversity. The first step in this process is to identify Areas of Interest (AOIs).

1) Additional Consultations on AOIs:
    - As was previously briefed to the board, the AOI Working Group carried out consultations with the Hunters and Trappers Associations and community members in the vicinity of the nine potential AOIs (three in each Nunavut region). The objective of these sessions was to gauge the level of support for the potential development of an MPA near communities. As previous attempts to meet with the Rankin Inlet HTO were unsuccessful due to scheduling conflicts, a targeted consultation with the Rankin Inlet HTO and members of the AOI WG occurred in October 2017.
    - A draft report summarizing these consultations was previously provided to the NWMB and will be updated shortly to include the recent Rankin Inlet consultation.
    - Oceans staff provided overviews and updates at both the Kivalliq and Kitikmeot Regional Wildlife Boards' Annual General Meetings (AGM), and will be providing one at the Qikiqtani Regional Wildlife Board in November 2017.
      Additional consultations will be carried out through the different stages of the MPA development process in the Nunavut Settlement Area.

2) Nunavut MCT Steering Committee
    - As previously briefed to the board, a Marine Conservation Steering Committee has been established to facilitate information sharing and coordination among marine conservation initiatives underway in Nunavut. The Nunavut MCT Steering Committee is different from the AOI WG as it focuses on coordination and

collaboration across marine conservation initiatives in Nunavut, not just those led by DFO.

- Membership includes Nunavut Tunngavik Inc., Nunavut Wildlife Management Board, Nunavut Marine Council, Government of Nunavut and federal departments.
- It has held two conference calls and one face-to-face meeting ( Sept 6-7, 2017). These early meetings have been focused on information sharing and establishing the Terms of Reference for this committee.
- The Sept meeting was attended by a senior Nunavut Wildlife Management Board staff member. A presentation was given on the Nunavut Marine Council.

**Prepared by:** Central and Arctic Region – Fisheries and Oceans Canada, Oceans Program
**Date:** October 27, 2017

# SUBMISSION TO THE NUNAVUT WILDLIFE MANAGEMENT BOARD December 2017

**FOR**

**Information: X** **Decision:**

**Issue:** Department of Fisheries and Oceans Canada Updates

**Updates:**

***Marine Mammals:***

1) Narwhal:

- The Minister of DFO has accepted the NWMB's decision to approve the full implementation of the Flex-Quota System and Tag Transfer Policy Phase II components of the Integrated Fisheries Management Plan Management Plan) for Narwhal within the Nunavut Settlement Area.
- The Minister of DFO has accepted the NWMB's decision to modify the total allowable harvests for the Somerset Island; East Baffin Island, Jones Sound and Smith Sound Narwhal Stocks. The decision making process to modify Total Allowable Harvest for the Admiralty Inlet and Eclipse Sound Narwhal stocks has been adjourned until the results from the 2016 Arial Survey have been finalised.
- The 2016 Arial survey photographs and results are still be analyzed. A working paper will be presented at the annual National Marine Mammal Peer Review Committee (NMMPRC) meeting November 28–December 1, 2017. The goal is to have the Science Advisory Report finalized for a PART 2 meeting of the NMMPRC in late February 2018

2) Walrus:

- A total of 18 Walrus Sport Hunt licences were issued by DFO for the 2017 season. Coral Harbour (11 hunts), Iqaluit (2 hunts) Hall Beach (4 hunts) and Igloolik (1 hunt).
- The Integrated Fisheries Management Plan (IFMP) for Atlantic Walrus was approved by the NWMB in June 2016, and the decision accepted by the Minister in September 2016.
- At the request of Qikiqtaaluk Wildlife Board, DFO conducted additional consultations with walrus harvesting communities on the walrus IFMP over the winter of 2017. No concerns were identified, and the consultation report has been provided to the NWMB.

- The IFMP is being presented to the NWMB for formal signature. Based on the 2016 NWMB decision, the final IFMP includes the following changes:
    - The IFMP has been updated to exclude the Areas of Equal Use and Occupancy, and the maps have been revised to reflect this;
    - “Nunavut Lands Claims Agreement” has been changed to “Nunavut Agreement”;
    - The harvest table has been updated; and
    - An appendix has been added to include the management unit boundary coordinates.

3) Cumberland Sound Beluga:
- A total of 38 Beluga were reported harvested in Pangnirtung this summer
- Four biological sampling kits were submitted to DFO from this year’s annual subsistence harvest in an effort to obtain genetic evidence of the second group of whales, which is thought to enter Cumberland Sound

4) Bowhead:
- Due to financial and logistical issues only two of the five selected host communities proceeded with a Bowhead Hunt for 2017.
- DFO issued Marine Mammal Fishing Licences for Coral Harbour and Kimmirut to conduct a hunt; however, neither community was able to harvest a Bowhead for 2017.
- Due to scheduling conflicts the Bowhead Working Group meeting scheduled for the first week of October had to be postponed. The new date for the meeting has not been determined.
- Goals for this meeting were to introduce new members, nominate a co-chair, review progress to date, identify additional items for discussion, and develop a timeline to complete a draft Management Plan for public consultation.

5) Harvest Reporting:
- DFO office contacted HTOs, requesting harvest updates for beluga, walrus, and narwhal. Reports of total marine mammal hunting mortality (landed + lost) are essential to develop reliable advice on sustainable harvests.
- DFO urges continued reporting of unusual marine mammal occurrences and events e.g. beached carcass, ice entrapments, etc.
- Timely and accurate reporting is required under the Fisheries Act, Marine Mammal Regulations, and the Nunavut Agreement. It is strongly recommended that co-management organizations emphasize the importance of harvest reporting and monitoring

***Arctic Char:***

1) Pangnirtung Fishery
- A total of 16,508kg was harvested in the Pangnirtung Summer Fishery
- A total of 51,100kg was harvested in the Cambridge Bay Summer Fishery

2) Pond Inlet Emerging Arctic Char Fishery:
- The Pond Inlet Exploratory Arctic Char Fishery was licensed on July 28, 2017.
- A DFO Fisheries Technician participated for a portion of this year's summer sampling
- The 2017 data and samples have been submitted to DFO and currently in the process of organising and inventorying the data.
- Five years of data collection has now been accomplished for two waterbodies; Tuapak and Kooluktoo Bay and DFO is currently examining options for ageing these samples.

***Greenland Halibut (Turbot):***

1) Cumberland Sound Turbot Fishery
- The open water Cumberland Sound Turbot Management Area licence was issued to the Cumberland Sound Fisheries Limited's vessel the Pijiuja II.
- The licence is for 50.605mt of Turbot, which is the remainder of the 500mt Total Allowable Harvest after the ice fishery.
- A total of 9,109kg was reported landed at Pangnirtung Fisheries from nine good days of fishing. Adverse weather conditions caused a delay in the fishing effort

2) Offshore Fishery:
- A total of 6687.30mt has been harvested in NAFO Division 0A
- A total of 3007.84mt has been harvested in NAFO Division 0B
- A total of 860mt has been harvested in the NAFO Division 0B Competitive Fishery
- DFO is still waiting on offload documents from landings made in Greenland to finalize harvest statistics for 2017
- Supplementary licence conditions were issued to Arctic Fishery Alliance to conduct experimental fishing for 1000kg of Porcupine Crab in NAFO Division 0B

***Northern Shrimp:***

- For Nunavut fishing industry in shrimp fishing areas adjacent to Nunavut:
- A total of 784.33mt has been harvested in Davis Strait East
- A total of 915.641mt has been harvested in Davis Strait West
- A total of 418.295mt has been harvested in Shrimp Fishing Area 1

**Prepared by:** Central and Arctic Region – Fisheries and Oceans Canada

**Date:** October 26, 2017

Fisheries and Oceans Canada    Pêches et Océans Canada

# Integrated Fisheries Management Plan for Atlantic Walrus (*Odobenus rosmarus rosmarus*) in the Nunavut Settlement Area


Canada

# Foreword

The purpose of this Integrated Fisheries Management Plan (IFMP) is to identify the objectives and requirements for the Atlantic walrus (*Odobenus rosmarus rosmarus*) fishery in the Nunavut Settlement Area, and the management measures that will be used to achieve these objectives. This document also serves to communicate the basic information on the fishery and its management to Fisheries and Oceans Canada (DFO) staff, legislated co-management boards, Hunters and Trappers Associations (HTOs), Regional Wildlife Boards (RWOs), Inuit, communities and other stakeholders. This IFMP provides a common understanding of the basic "rules" for the sustainable management of the fisheries resource.

**This IFMP is not a legally binding instrument which can form the basis of a legal challenge. The IFMP can be modified at any time and does not fetter the Minister of Fisheries and Oceans' discretionary powers set out in the *Fisheries Act*. The Minister can, for reasons of conservation or for any other valid reasons, modify any provision of the IFMP in accordance with the powers granted pursuant to the *Fisheries Act*, and subject to the relevant terms of the *Nunavut Agreement.***

Where DFO is responsible for implementing obligations for any land claims agreements, the IFMP will be implemented in a manner consistent with these obligations. In the event that an IFMP is inconsistent with obligations under land claims agreements, the provisions of the land claims agreements will prevail to the extent of the inconsistency.

____________________________________________

Dale Nicholson, A/Regional Director General, Central and Arctic Region
Fisheries and Oceans Canada

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Date

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Daniel Shewchuk, A/Chairperson, Nunavut Wildlife Management Board

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Date

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# Acronym List

BB- Baffin Bay
BNL- Basic Need Level
CITES- Convention on International Trade in Endangered Species
COSEWIC- Committee on the Status of Endangered Wildlife in Canada
DFO- Department of Fisheries and Oceans
FB- Foxe Basin
HBDS- Hudson Bay- Davis Strait
HTO- Hunters and Trappers Organization
IFMP- Integrated Fisheries Management Plan
IQ- Inuit Qaujimajatuqangit
MMFL- Marine Mammal Fishing Licence
MMR- Marine Mammal Regulations
NA- Nunavut Agreement
NAMMCO- North Atlantic Marine Mammal Commission
NILCA- Nunavik Inuit Land Claim Agreement
NMRWB- Nunavik Marine Regional Wildlife Board
NQL- Non-Quota Limitation
NSA- Nunavut Settlement Area
NTI- Nunavut Tunngavik Incorporated
NWMB- Nunavut Wildlife Management Board
PSLS- Penny Strait- Lancaster Sound
PBR- Potential Biological Removal
RWO- Regional Wildlife Organization
SARA- Species at Risk Act
SEHB- South and East Hudson Bay
TAH- Total Allowable Harvest
TALC- Total Allowable Landed Catch
TEK- Traditional Ecological Knowledge
WJS- West Jones Sound

# 1. Overview

The following is an Integrated Fisheries Management Plan (IFMP) that will be used to provide direction in the management of Atlantic walrus (*Odobenus rosmarus rosmarus*) stocks in the Nunavut Settlement Area (NSA). Walrus in the *Areas of Equal Use and Occupancy*, as set out in Schedule 40-1 of the *Nunavut Agreement* (NA), will continue to be managed under applicable Acts, Regulations and land claims agreements, and are currently excluded from the management structure identified within this IFMP.

This IFMP was developed and will be implemented by the Government of Canada and co-management organizations through an adaptive co-management process. Working Groups comprised of Hunters and Trappers Organizations (HTO) from Arctic Bay, Grise Fiord, Hall Beach, Igloolik, Pond Inlet and Resolute, Qikiqtaaluk Wildlife Board (QWB), Nunavut Tunngavik Incorporated (NTI), the Nunavut Wildlife Management Board (NWMB) and the Department of Fisheries & Oceans (DFO) were formed to lead the development of the IFMP. The Working Groups have been instrumental in the development of the IFMP.

## 1.1 History

The walrus is one of the largest members of the seal family with two subspecies recognised. Pacific walrus inhabit the Bering, Chukchi, and Laptev seas. Atlantic walrus inhabit coastal areas of north-eastern Canada, Greenland and Svalbard (NAMMCO 2004).

Walrus have been harvested by Arctic indigenous peoples for thousands of years, providing valuable products such as blubber, bones, tusks and meat. The commercial harvesting of walrus in the 19th and 20th centuries resulted in a rapid decrease of walrus across their Arctic ranges, including the extirpation of the Northwest Atlantic population. By 1928, commercial harvesting of walrus was banned in Canada by the Walrus Protection Regulations. Currently walrus in the NSA are managed under the *Marine Mammal Regulations,* the *Fisheries Act* and the NA.

Walrus are a key species in the Arctic marine food web, are of high economic, social and cultural importance for Inuit, and are iconic to Canadians since they are so easily identified with the Arctic environment.

## 1.2 Type of Fishery and Participants

Atlantic walrus are primarily harvested by Inuit, and are highly valued as a traditional source of food and other products. The Inuit hunt provides an opportunity to maintain cultural traditions and for experienced hunters to pass on their skills and knowledge to younger generations. Walrus products also provide a secondary source of income for hunters. Walrus ivory is either sold raw, or carved into fine art pieces such as jewelry or sculptures. Some communities engage in a small-scale sport hunt conducted by non-Inuit hunters.

## 1.3 Location of the Fishery

Atlantic walrus are found across most of Nunavut, with the majority of harvests occurring in eastern Nunavut (Figure 1).

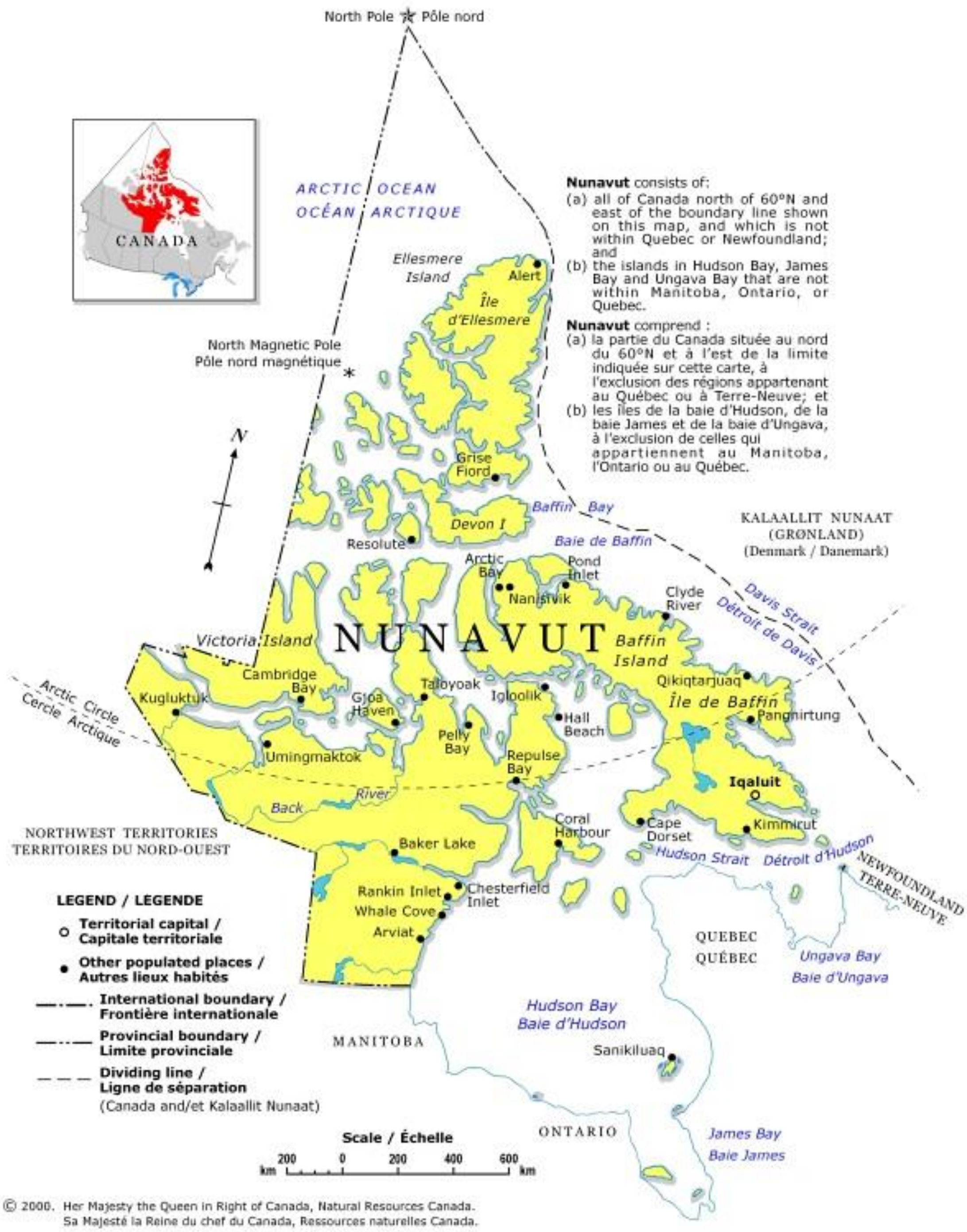


**Figure 1. Map of the eastern Canadian Arctic, showing locations mentioned in the text.**

## 1.4 Governance

The walrus fishery in the NSA is co-managed by DFO, the NWMB, RWOs and HTOs, in accordance with the Nunavut Agreement (NA or Agreement), and the *Fisheries Act* and its regulations. Under this co-management regime, the NWMB is the main instrument of wildlife management in the NSA, but the Minister retains authority and ultimate responsibility for wildlife management and conservation of fish, including marine mammals.

*Fisheries Act, regulations, and policies*

The walrus fishery is regulated by the *Fisheries* Act (R.S., 1985, c. F-14) and regulations made pursuant to it, including the *Fishery (General) Regulations* and the *Marine Mammal Regulations.* Where there is an inconsistency between the regulations and the Agreement, the Agreement shall prevail to the extent of the inconsistency.

DFO has adopted a Sustainable Fisheries Framework for all Canadian fisheries to ensure that objectives for long-term sustainability, economic prosperity, and improved governance for Canadian fisheries are met. The Sustainable Fisheries Framework contains policies for adopting an ecosystem based approach to fisheries management, including *A Fishery Decision-Making Framework Incorporating the Precautionary Approach*, and *Managing Impacts of Fishing on Benthic Habitat, Communities and Species.* This policy framework applies to the walrus fishery in the Nunavut Settlement Area.

These documents are available on the Internet at:

http://www.dfo-mpo.gc.ca/reports-rapports/regs/sff-cpd/overview-cadre-eng.htm

*Nunavut Agreement*

In 1993, Canada settled a comprehensive land claim agreement with the Inuit of the NSA. The NA created priority access and wildlife harvesting rights for Inuit and other Aboriginal groups who traditionally harvested within the NSA.

The NA also created an Institution of Public Government, the NWMB, to share decision making authority with the Federal Government. The NWMB and DFO Minister consider matters relating to the proper management and control of fisheries and the conservation of fish within the NSA. Under this co-management regime, the NWMB is the main instrument of wildlife management, but the Minister retains ultimate responsibility for wildlife management and may accept, reject or vary decisions made by the NWMB with respect to harvesting and other decisions related to the management and protection of wildlife and wildlife habitat.

The NA establishes wildlife management authority for the NWMB including the establishment, modification, and removal of levels of Total Allowable Harvest (TAH) or harvesting in the NSA, as well as Non-Quota Limitations (NQLs) on harvesting such as management units and harvesting seasons. Once a total allowable harvest has been established, the NWMB is also required to strike a Basic Needs Level (BNL), which is the portion of the TAH allocated to Inuit that constitutes the first demand on the TAH. Once established for a stock or population, the TAH replaces the existing regulatory quota.

The NL establishes wildlife management authority for RWOs and HTOs. The powers and functions of the RWOs (NA 5.7.6) include:

- Regulation of harvesting practices and techniques among the members of HTOs in the region, including the use of non-quota limitations.
- Allocation and enforcement of regional basic needs levels and adjusted basic needs levels among HTOs in the region.
- Assignment to any person or body other than an HTO, with or without valuable consideration and conditions, of any portion of regional basic needs levels and adjusted basic needs levels.
- Generally, the management of harvesting among the members of HTOs in the region.

The powers and functions of the HTOs (NA 5.7.3) include:

- Regulation of harvesting practices and techniques among the members, including the use of non-quota limitations.
- Allocation and enforcement of community basic needs levels and adjusted basic needs levels among members.
- Assignment to non-members, with or without valuable consideration and conditions, of any portion of community basic needs levels and adjusted basic needs levels.
- Generally, the management of harvesting among the members.

The NA establishes authority to Nunavut Tunngavik Incorporated (NTI) as the primary Designated Inuit Organizations (DIO) under the Agreement. It is responsible for ensuring that Inuit rights and obligations under the land claim are implemented, including the wildlife management provisions (Article 5) of the NA.

Under the NA, wildlife management and Inuit harvesting are guided by the principles of conservation (NA s.5.1.5).

The Nunavut Agreement is available on the internet at:
https://www.aadnc-aandc.gc.ca/eng/1100100030601/1100100030602

## 1.5 Fishery Characteristics

In Nunavut, Atlantic walrus are harvested year round. Inuit hunters use a combination of modern equipment, such as snowmobiles, boats with outboard motors, and rifles, as well as traditional sleds, harpoons and floats. Typically, walrus are hunted from boats when they are on ice floes or while they are swimming in open water. In most cases walrus are shot first and then harpooned. Hunters prefer to kill walrus on ice where they are easier to retrieve and process. Animals on the ice are shot from close range with the intention of killing them immediately before they can fall into the water. Loss rates can be high when walrus are killed in deep water because they sink quickly (NAMMCO 2004, COSEWIC 2006). To reduce losses, animals in the water may be harpooned before they are shot, wounded so they can be harpooned before being killed, or killed in shallow water where they can be retrieved with grappling hooks or at low tide (NAMMCO 2004, COSEWIC 2006). Harpooning a walrus is dangerous, since animals must be approached to within 10m and wounded walrus become very aggressive and can capsize canoes or small boats

(COSEWIC 2006). Floats made from seal skin are still heavily used, although hunters are finding that modern floats are more durable.

Some communities conduct walrus sport hunts. Individuals hunting under the authority of a marine mammal fishing licence issued by DFO must travel with local guides approved by the HTO. The licence stipulates when and where the hunt is authorized to take place, by whom, their country of origin, quotas, gear type to be used, as well as any specific conditions related to the hunt, such as the reporting of all hunts to the local DFO office, firearm muzzle velocity requirements, and the total number of strikes allowed. Individual HTOs may also have local by-laws. Licenced sport hunters report harvest information directly to DFO. See section 6 and Appendix 3 for more information on walrus sport hunts.

**Table 1. Primary Harvesting Communities of Atlantic Walrus in the Eastern Canadian Arctic**

| **Population** | **Stock** | **Nunavut Harvesting Communities** | **Nunavik Harvesting Communities** | **Greenland Harvesting Communities** |
|---|---|---|---|---|
| High Arctic | Baffin Bay | Grise Fiord | | Qaanaaq<br>Avanersuaq |
| | West Jones Sound | Grise Fiord | | |
| | Penny Strait-Lancaster Sound | Resolute Bay<br>Arctic Bay<br>Pond Inlet | | |
| Central Arctic | Foxe Basin (northern and central Foxe Basin stocks) | Igloolik<br>Hall Beach | | |
| | Hudson Bay-Davis Strait | Clyde River<br>Qikiqtarjuaq<br>Iqaluit<br>Pangnirtung<br>Arviat<br>Cape Dorset<br>Chesterfield Inlet<br>Coral Harbour<br>Kimmirut<br>Rankin Inlet<br>Repulse Bay<br>Whale Cove | Puvirnituq<br>Akulivik<br>Ivujivik<br>Salluit<br>Kangiqsualujjuaq<br>Kuujjuaq<br>Tasiujaq<br>Aupaluk<br>Kangirsuk<br>Quaqtaq<br>Kangiqsujuaq | Sisimiut |
| Unknown | South and East Hudson Bay | Sanikiluaq | Inukjuak<br>Kuujjuarapik<br>Umiujaq | |

(COSEWIC 2006, Stewart 2008a)

### 1.6 Approval Process

This IFMP has been approved by the Minister of DFO and the NWMB pursuant to section 5.2.34 of the NA. It will be reviewed and amended as necessary in collaboration with co-management organizations to ensure it remains relevant and current with new science, Traditional Ecological Knowledge and Inuit Qaujimajatuqangit.

This IFMP will be translated to Inuktitut and made available from DFO.

## 2. Stock Assessment, Science and Traditional Knowledge

### 2.1 Biological Synopsis

The walrus is Canada's largest member of the seal family. It is a large animal with limbs that have developed into flippers, upper canine teeth that develop into long tusks (ivory) at about 2 years of age, and a moustache made of quill-like whiskers. Males and females are about 125 cm long at birth. As adults, males are significantly larger than females (Garlich-Miller & Stewart 1998). Adult males reach up to 1,100 kg in weight and 3.1 m in length and females can reach 800 kg and 2.8 m in length. Walrus can live to 40 years of age, and are considered to be long-lived animals. As walrus have a delayed sexual maturation, fairly low reproductive rates and specialized habitat requirements, they are vulnerable to over-harvesting and sensitive to environmental changes (COSEWIC 2006).

Mating occurs from February to April. Little is known about their reproduction because they mate in the water and in remote areas. Males mature between 7 and 13 years of age and compete intensely for females, defending access to them for up to five days. Females mature between 5 and 10 years of age and give birth on average every three years. Gestation lasts about 11 months and the young nurse for up to 27 months. Expectant mothers move onto land or ice to give birth. Protective care by mothers and the herd assures high calf survival (DFO 2007).

### 2.2 Ecosystem Interactions

The habitat requirements of the Atlantic walrus are very specific. They need large areas of shallow (100 m or less), open water that support an abundant clam community. In addition, there must be ice or land nearby to ‘haul out’. Moving pack ice is ideal for this purpose; however, in the summer and fall if ice is scarce, large herds congregate and haul out on low, rocky shores with steep subtidal zones. In areas of deeper water without plentiful clams, some walrus will consume seals. These walrus tend to be more aggressive, and are usually solitary or found in smaller groups. Although some hauled out groups of walrus may contain animals of all ages and both sexes, walrus tend to segregate by age and sex during most of the year. It is thought that females and their young return to certain sites more faithfully than do adult males (DFO 2007). Following harvesting by humans, polar bears are thought to be the main predators of walrus, though it is believed they take few animals.

The full effects of climate change on Atlantic walrus are unknown. However, potential effects of a warming climate may include, but are not limited to:

- A reduction in winter and summer ice cover
- A rise in sea level
- An increase in sediment transport
- An increase in the frequency and severity of storms
- An increase in the presence of killer whales in the Arctic.

These may all be important factors for walrus, potentially impacting food supply and/or quality, ecosystem interactions, affecting their ability to access food and appropriate haulout sites, thereby influencing their health, distribution and abundance. These affects could also impact hunters' ability to access walrus.

### 2.3 Traditional Ecological Knowledge

Traditional Ecological Knowledge (TEK) of walrus throughout Canada's Arctic is extensive. Each community has hunters and elders that have knowledge in areas of distribution, seasonality, migration, birthing areas and haulout sites. Inuit have observed changes with respect to impacts from climate change, past and present disturbances and development/exploration. When shared, this information is considered with scientific knowledge to provide a more robust understanding of walrus distribution, movements and environmental interactions. TEK has also been used in assisting with the delineation of stocks and is used in the design of surveys by DFO Science to estimate population abundance. TEK is used with scientific data and observations to contribute to management decisions, as well as to identify information gaps, areas of uncertainty, and to set research priorities.

TEK has been recorded on unpublished maps, in meetings minutes, documented in a number of different published papers (DFO 2002a, DFO 2012a, NCRI 2014), and through consultations with experienced hunters and community elders.

Inuit Qaujimajatuqangit (IQ) consists of TEK, as well as Inuit beliefs about how the world works, and the values necessary to behave in an ethical manner in human interactions with the animals and the environment. The collaborative approach to developing this IFMP for walrus that includes representatives from HTOs and other co-management organizations has assisted in the inclusion of IQ, such as decision-making through consensus, working together for a common cause, and respect and care for the land, environment and animals (NWMB). This IFMP will allow for the continued inclusion of IQ, TEK and science as it becomes available.

### 2.4 Stock Delineation

Two populations of walrus have been identified in Canada based on analysis of microsatellite DNA (Shafer et al. 2013): the high Arctic population (comprised of the West Jones Sound, Baffin Bay and Penny Strait-Lancaster Sound stocks) and the central Arctic population (including the north and central Foxe Basin stocks and the Hudson Bay-Davis Strait stocks).

There are a number of factors used in delineating stocks, including ecological factors that determine distribution of walrus (ice cover, polynyas, shallow banks with suitable habitat, migration routes and availability of haulout sites), historical and current distribution, seasonal movements, age and sex composition, catch levels, composition of catches and hunting loss, hunter observations, harvest sites, survey observations, genetic information, satellite tagging data, heavy metal/ organochlorine data, lead isotope ratios and trace elements (Stewart 2008b).

Based on consultations with local communities, stock reassessment by the North Atlantic Marine Mammal Commission (NAMMCO) (2011), and Stewart (2008a), six stocks or management units of Atlantic walrus have been identified for management purposes in the NSA (Figure 2).

These include:

- Baffin Bay- Management Unit AW-01 (shared with Greenland);
- West Jones Sound- Management Unit AW-02;
- Penny Strait-Lancaster Sound- Management Unit AW-03;
- Foxe Basin- Management Unit AW-04;
- Hudson Bay- Davis Strait- Management Unit AW-05 (shared with Nunavik and Greenland);
- South and East Hudson Bay- Management Unit AW-06 (shared with Nunavik).

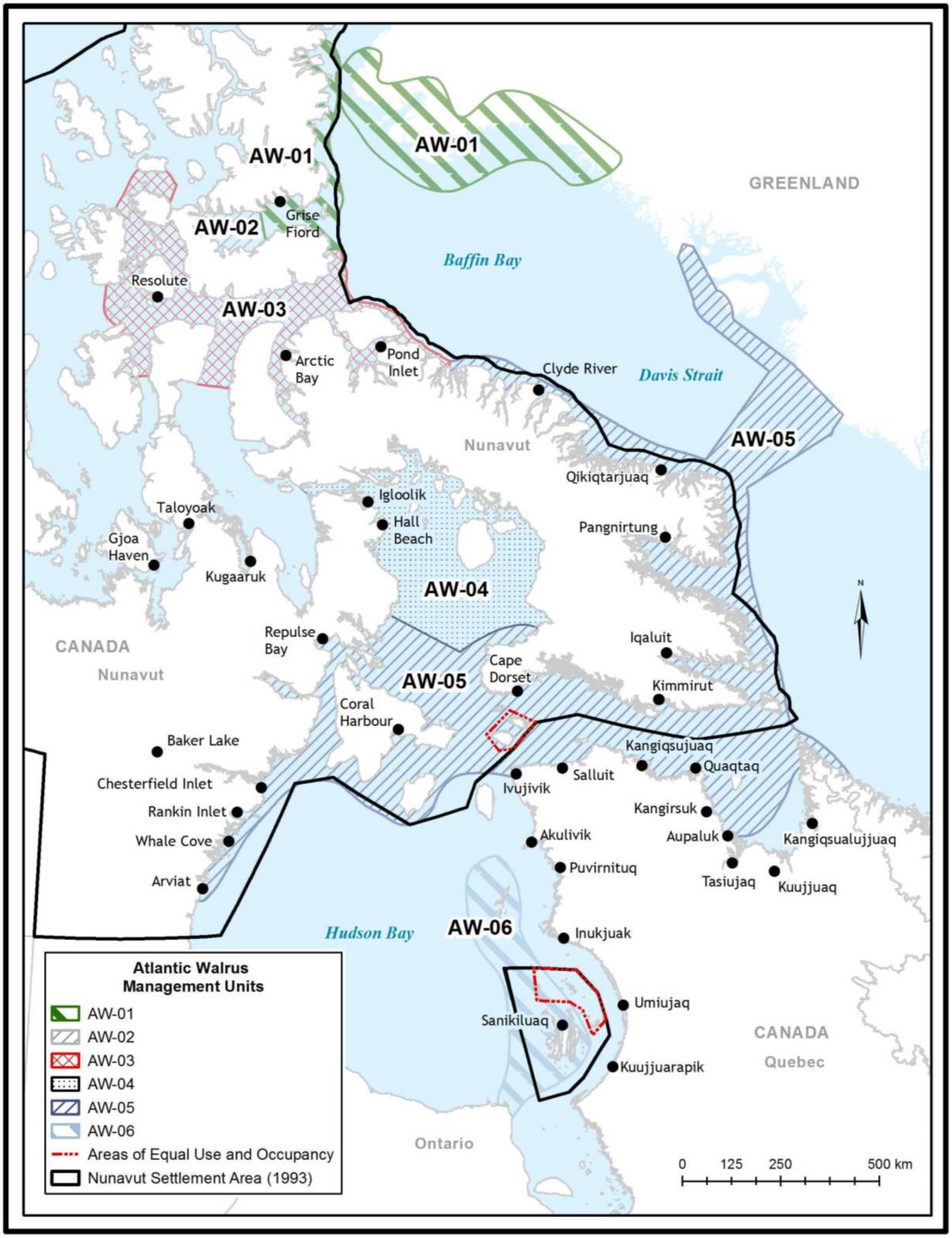


Figure 2. Location of Atlantic walrus management units in the eastern Canadian Arctic and the Nunavut Settlement Area.

Note: This version of the IFMP does not apply to the *Areas of Equal Use and Occupancy* as set out in Schedule 40-1 of the *Nunavut Agreement*.

## 2.5 Precautionary Approach

A precautionary approach to fisheries management links harvest level recommendations with stock assessment data. Lower harvest levels are recommended when stock assessments are uncertain to avoid serious harm to fish or marine mammal stocks or their ecosystem. A lack of stock assessment data should not be used as a reason to postpone, or fail to take, management actions. This approach is widely accepted as an essential part of sustainable fisheries management.

In accordance with the *Fisheries Act* and the NA, the best available information guides walrus management decisions made on behalf of the NWMB and the Minister. A management decision to restrict Inuit harvesting shall do so only to the extent necessary to affect a valid conservation purpose; to give effect to the allocation system outlined in the NA; or to provide for public health or public safety (NA s. 5.3.3).

The amount of information available for resource management varies among species and populations. For those species where information on abundance, mortality and reproductive rates may be limited, DFO uses the Potential Biological Removal (PBR) method to estimate the maximum number of animals that may be removed by all human activities without depleting the stock or population (DFO 2012b). This total amount of removals accounted for using PBR would include removals of harvested animals, animals shot at, but not harvested (called struck and lost), as well as losses to ship strikes, net entanglements and any other human activities. The PBR is calculated using a number of biological parameters (Stewart 2008b, Stewart and Hamilton 2013).

In calculating sustainable harvest levels, PBR results are multiplied by a Loss Rate (LR) to obtain Total Allowable Landed Catch (TALC) values. Loss rates represent all indirect human caused mortalities (struck and lost, ship strikes, net entanglements). At this time, only struck and lost rates are considered in the estimate of TALC; however, this may change if more information becomes available.

$$TALC = PBR\ (1- LR)$$

Struck and lost rates are incomplete for walrus and can vary with season, weather, location, hunter experience, hunting technique/equipment, and animal behavior. In Canada, struck and lost rates have been documented to range between 30% and 32% (Orr et. al 1986), although some hunters believe the rates to be as low as 5% (DFO 2002a). Inuit harvesters have noted that loss rates will vary depending on when and how the walrus is harvested. NAMMCO applies a struck and lost rate of 30% for those stocks lacking specific loss rate information (2006).

## 2.6 Stock Assessment and Trends

Most indicators of trends in stock size are based on distributional changes, differences in physical conditions of the animal, and harvest data. Whenever there is a local decrease in numbers, it may be that the animals have moved to another area, but until increases in other parts of the range have been clearly documented, the possibility of a reduction in numbers should be considered.

Walrus are widely distributed in the eastern Canadian Arctic, and are most often found in aggregations, or groups, numbering from the tens, to thousands. In order to estimate walrus numbers, aerial surveys are conducted of walrus haulouts. Walrus haulouts are identified based on a number of factors including information from past surveys, existing scientific information, and local traditional knowledge. Data from satellite tags active during surveys are used to adjust the haulout counts to account for animals at sea, and therefore missed by the survey. If no active tags are in the survey area at the time of the survey, data from other walrus studies are used to estimate the numbers of walrus at sea, and determine an abundance estimate. Although aerial surveys combined with satellite telemetry are the standard methods used to estimate abundance of walrus populations across their range, new approaches, such as genetic capture-mark-recapture methods, should be investigated.

The most recent science advisory report on walrus abundance estimates can be found at:
ENGLISH: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2013/2013_034-eng.pdf; and: http://waves-vagues.dfo-mpo.gc.ca/Library/365442.pdf
INUKTITUT: http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2013/2013_034-inu.pdf; and http://www.dfo-mpo.gc.ca/csas-sccs/Publications/SAR-AS/2016/2016_007-inu.pdf

### *Baffin Bay (BB) - Management Unit AW-01*

In Canada, the Baffin Bay stock extends from eastern Jones Sound to eastern Ellesmere Island and NW Greenland (Stewart 2008a). Analysis of aerial surveys conducted by DFO and Greenland Institute of Natural Resources in 1999, 2005, and 2009 resulted in population abundance estimates ranging from 1,249 to 1,251 and PBR estimates to range from 10 to 11 walrus (DFO 2013, Stewart et al. 2013a, Stewart and Hamilton 2013). See Figure 2.

### *West Jones Sound (WJS) - Management Unit AW-02*

This stock is separated from the Baffin Bay stock by seasonal distribution and tag movements (Stewart 2008a). Aerial surveys by DFO were conducted between 1998 and 2009, resulting in an abundance estimate ranging from 470 to 503, and PBR estimates ranging from 7 to 17 animals (DFO 2013, Stewart et al. 2013b, Stewart and Hamilton 2013). There was no statistically significant evidence of population change between these surveys and the late 1970s, but there were differences in coverage and walrus distribution may have changed. See Figure 2.

### *Penny Strait- Lancaster Sound (PS/LS) - Management Unit AW-03*

This stock is separated from the Baffin Bay stock by isotope data, and from the West Jones Sound stock by distribution and tag movements (Stewart 2008a). Aerial surveys were conducted between 1998 and 2008 and resulted in an abundance estimate of 727 walrus in 2009 and PBR estimates ranging from 10 to 24 animals (DFO 2013, Stewart et al. 2013b, Stewart and Hamilton 2013). There was no statistically significant evidence of a trend in population numbers when the recent surveys were compared to similar surveys in the late 1970s, although differences in coverage and possible changes in walrus distribution may influence comparisons. See Figure 2.

### *Foxe Basin (FB) - Management Unit AW-04*

Stewart (2008b) delineated the Foxe Basin stock into 2 units: northern Foxe Basin stock and central Foxe Basin stock. In Foxe Basin, the two stocks share an overwintering area and breed as a single unit, but they may occupy different areas in the summer and may be susceptible to different hunting pressures. Lead isotope ratios and trace element profiles from teeth suggest two different stocks, and since isotope ratios are a reflection of the migratory patterns of the animals, they are useful in discriminating management units. Although there is evidence to delineate two stocks in the Foxe Basin area, currently there is not enough information (science or TEK) to visually or geographically separate the stocks within the larger Foxe Basin area. Therefore, until additional information is available to further partition this stock, the management of walrus will continue to occur at the larger Foxe Basin management unit. See Figure 2.

Analysis of surveys conducted in 2010 and 2011 resulted in a range of abundance estimates of 8,153-13,452 and PBR estimates ranging from 211-422 walrus (DFO 2016, Stewart et al. 2013c, Stewart and Hamilton 2013).

Changes in the distribution of walrus within Foxe Basin have been documented by local hunters and researchers, with many haulouts being abandoned on the west coast (Mansfield 1966, Brody 1976, Anderson and Garlich-Miller 1994, DFO 2002a). This may suggest declines in numbers of walrus, habitat availability, or both. Local Inuit have noted that ice conditions have changed in Foxe Basin resulting in a reduction of multiyear ice that walrus use for hauling out on.

### *Hudson Bay-Davis Strait (HBDS)- Management Unit AW-05*

Walrus from the *Hudson Bay-Davis Strait* (HBDS) stock have been distinguished from the other five stocks based on distances, movements, differences in growth patterns, as well as differences in genetics, contaminants, and lead isotope ratios (DFO 2002b, COSEWIC 2006, Stewart 2008a). A comprehensive, systematic survey over the entire geographic area has not occurred for this stock. Currently, due to the limited amount of data over the stock's full range, it is not possible to determine the size or trend of this stock. See Figure 2.

### *South and East Hudson Bay (SEHB- Management Unit AW-06*

The *South and East Hudson Bay* walrus stock was originally delineated by Born et al. (1995) on the basis of distribution, but since then, lead isotope data has provided stronger evidence that supports the differentiation between this stock and the *Hudson Bay-Davis Strait* stock (Stewart 2008a). A complete or comprehensive survey of this stock has not been conducted. Based on a few walrus sightings in a large geographical area over a long period of time, Richard and Campbell (1988) and Born *et al*. (1995) estimated the population size to be a minimum of 410 and 500 animals, respectively (COSEWIC 2006). Currently, due to the limited amount of data, it is not possible to determine the size or trend of this stock. See Figure 2.

**Table 2. Abundance Estimates and Potential Biological Removal Levels (PBR) for Atlantic Walrus in the Eastern Canadian Arctic**

| Population | Stock/Management Unit | Abundance Estimates | PBR |
|---|---|---|---|
| High Arctic | Baffin Bay (BB)/ AW-01 | 1249-1251 | 10-11 |
| | West Jones Sound (WJS)/ AW-02 | 470-503 | 8-17 |
| | Penny Strait- Lancaster Sound (PS-LS)/ AW-03 | 623-831 | 12-24 |
| Central Arctic | Foxe Basin/ AW-04 | 8,153-13,452 | 211-422 |
| | Hudson Bay-Davis Strait/ AW-05 | No recent estimate. | --- |
| Unknown | South and East Hudson Bay/ AW-06 | No recent estimate. | --- |

(Stewart and Hamilton 2013, DFO 2013, DFO 2016)

PBR represents the total number of animals that can be removed from all human activities while allowing the stock or population to maintain or achieve its optimal sustainable level.

### 2.7 Research

The following research is required:

- Determine abundance estimates for Hudson Bay-Davis Strait and South and East Hudson Bay stocks;
- Apply new methods to determine walrus abundance, such as genetic capture-mark-recapture;
- Continue to research genetic diversity and stock discrimination;
- Continue to investigate and assess potential threats resulting from human activities (e.g., shipping routes, noise disturbance, tourism);
- Determine the extent of exchange between shared Canada/Greenland stocks;
- Determine changes in habitat availability (pack ice and food); and
- Continue to investigate distribution and abundance of stocks.

## 3. Social, Cultural and Economic Importance of the Fishery

For centuries, walrus have been used by Inuit as a traditional food source and for supplying important materials for day to day living. Walrus meat is eaten in raw, cooked or fermented (*igunak)* forms by Inuit. Molluscs found in walrus stomachs are considered a delicacy in some Inuit communities (Whitford 2008). Some communities now obtain their walrus meat and tusks from hunters in other communities rather than conduct their own hunts (DFO 2012a).

Historically, walrus products provided materials for numerous necessities required for arctic living such as bones used for carvings, tent poles, and walking sticks, tusks/ ivory used to construct harpoons, toggles, handles, and handicrafts, sinews used for sewing thread, and skin for tents and ropes.  The tusk and baculum (penis bone) are valuable economic commodities and provide important sources of cash income, particularly, for the hunting communities. Ivory from walrus is commonly used for carvings and crafts and is sold both inside and outside the NSA. Although not as much trade occurs with walrus products as some other arctic species, international and domestic trade does still occur, mostly via exporters in southern Canada. International export of walrus products includes carved and un-carved tusks, bones, teeth, skeletons and skulls. International markets for Canadian walrus products include France, India, China, Japan, Korea, Singapore, United States and Australia (Shadbolt et. al 2014).

The walrus sport hunt in some communities can provide a major source of cash income through the hiring of local guides, and sport hunters purchasing various goods and services (food, crafts, and accommodations). Sport hunters are permitted to keep the tusks, baculum and head of the walrus, but the meat remains within the community for community use.

Hunting walrus, especially at traditional summer hunting camps, helps foster interdependence both within and between communities, provides opportunities to share knowledge between generations and community members and strengthens kinship ties and community cohesion. These cultural values are difficult to measure in economic terms but are very important to help maintain the Inuit way of life. The walrus hunt itself, as well as the sharing of the products of the hunt, continues to be of great social, cultural and economic significance to Inuit and the economic value of the meat and the ivory is substantial (COSEWIC 2006).

# 4. Management Issues

IFMPs are required to cover all aspects of a fishery, in particular, those areas that are related to the sustainability of the target species, ecosystem considerations and monitoring. The following represent the main management issues for the Atlantic walrus in the NSA.

## 4.1 Fisheries Issues

*Abundance Estimates*
While recent estimates are available for four of the six walrus stocks or management units, abundance estimates are still required for the Hudson Bay-Davis Strait stock and the South and East Hudson Bay stock. Funding for surveys will be needed to obtain abundance estimates and recommend sustainable harvest levels.

*Sustainable Harvest Levels*
It is important to ensure the conservation of walrus and that the harvesting of walrus is sustainable. There is growing national and international pressure to demonstrate that walrus are being harvested at sustainable levels. This will require the establishment of sustainable harvest levels for all stocks.

*Struck and Lost Rates*
Accurate struck and lost rates are important for understanding the impacts of hunting and to maximize sustainable harvest levels. Struck and lost rates vary or are incomplete in the NSA. Determining appropriate struck and lost rates are required in order to estimate sustainable harvest levels.

*Hunter Training/ Reducing Loss Rates*
Training for harvesters and youth has been identified as an important component for the sustainable management of the walrus fishery. This would include training on the best harvesting techniques, when and where to harvest, hunter safety, preparation and preservation of meat, and how to minimize struck and lost rates. HTOs may develop plans or best management practices that set out practical measures for community hunters to reduce the number of struck and lost walrus while harvesting.

*Monitoring and Reporting*
Once a TAH/BNL is established for walrus, a method to control removals will be required to ensure walrus harvesting remains within regulated harvest levels.

Timely, accurate reporting of walrus harvesting is essential. Without complete and accurate estimates of local harvesting activity, co-managers must exercise caution when recommending harvest limits so that vital, healthy walrus populations/stocks that are capable of sustaining harvesting needs of Inuit can be maintained. The timeliness of the reporting allows managers to assess the harvest as limits are approached.

*Sport Hunt*
There is a need for all HTOs that pursue sport hunt opportunities to develop by-laws or guidelines that would identify the community rules or best management practices for the sport hunt.

*Ship Traffic/Development/Tourism*
There are a number of potential impacts and threats to walrus and walrus habitat resulting from increased development and shipping activities. These could include increased oil spills, ship strikes, disruption of migration, avoidance of ecologically or biologically important areas (e.g. birthing, mating or feeding areas), noise disturbance and the introduction of alien or invasive species through activities such as ballast water exchange. Tourism is increasing in the Arctic and concern with increased disturbance to important walrus areas (e.g. haulouts) has been expressed.

## 4.2 Oceans and Habitat Considerations

Under the Health of the Oceans Initiative, Ecologically and Biologically Significant Areas (EBSAs) in the Eastern Arctic were identified (DFO 2011). Experts from Canadian federal departments, academics, Inuit organizations and various environmental non-government organizations having expertise in a number of different areas were involved. EBSAs are intended to identify areas that have high ecological or biological significance and are useful in assisting with management decisions.

The EBSAs were evaluated based on set criteria for marine biogeographic regions. Of the 41 EBSAs identified in the Eastern Arctic, 14 included walrus as a component contributing to the EBSA criteria. The ecological functions identified as being important for walrus included known distribution, presence of haulouts, migration corridors, presence of polynyas, calving areas and feeding grounds.

### 4.3 National and International Issues

*Food Safety*

Outbreaks of trichinosis have been reported in Nunavut over the years, most commonly from consuming meat that has been infected with a parasitic worm called *Trichinella nativa*, which lives inside the bodies of walrus and some other birds and mammals. The Government of Nunavut's department of health has responsibilities around food safety within the Nunavut Settlement Area and have established programs to test walrus meat for the parasite that causes the disease. Harvesters are asked to contact their HTO or a Government of Nunavut Environmental Health Officer for additional information on the Nunavut Trichinosis Prevention Program.

*COSEWIC and SARA*

COSEWIC (Committee on the Status of Endangered Wildlife in Canada) is an independent committee of government and non-government experts that assesses and designates the status of wildlife species that may be in some danger of disappearing from Canada. COSEWIC uses a process based on science, Aboriginal Traditional Knowledge and community knowledge to assess the risk of extinction for wildlife species. Wildlife species that have been designated at risk by COSEWIC may then qualify for legal protection and recovery or management under the Species at Risk Act (SARA).

The Species at Risk Act is a federal Act that was created to prevent Canadian species and their distinct populations from becoming extirpated or extinct, to provide for the recovery of Extirpated, Endangered or Threatened species, and to encourage the management of Special Concern species to prevent them from becoming further at risk. In the case of species listed as Special Concern, a management plan must be created which outlines the actions required to help prevent the species from becoming further at risk. For Extirpated, Endangered and Threatened species, a Recovery Strategy and Action Plan are developed which outline exactly what will be done to help recover the species to a larger, "pre-harm" population size. For Extirpated, Endangered and Threatened species, SARA also provides legal protection of their critical habitats and prevents any harm to the species, except under certain circumstances.

In 2006, COSEWIC designated Atlantic walrus as a species of Special Concern. However, the species is scheduled to be reassessed by COSEWIC and while the 'special concern' designation for a single population of Atlantic walrus could remain, it could be replaced with a higher designation of risk or multiple populations with multiple at risk designations. Once assessed by COSEWIC the Government of Canada will follow an established process to determine whether or not to recommend listing the species under the *Species at Risk Act*. This process includes biological, social and economic assessments of possible listing scenarios, as well as consultation with co-management organizations, stakeholders and interested individuals.

This IFMP could help inform any SARA-compliant documents that would be required if walrus was added to the List of Wildlife Species at Risk on SARA.

*CITES*
The Atlantic walrus is listed on Appendix III of the Convention on International Trade in Endangered Species (CITES). As such, anyone wishing to export walrus parts or derivatives from Canada must obtain an export permit from the Canadian CITES administration. A non-detriment finding (indicating that levels of export are not detrimental to the survival of the species in the wild) is not required for species on Appendix III of CITES.

In 2009 and 2012 the United States considered submitting a proposal to up-list walrus to Appendix II of CITES based on the lack of information around the management of the species (e.g. sustainable harvest levels) and population species information (e.g. population abundance estimates). If listed on Appendix II of CITES, a non-detrimental finding (NDF) decision from the DFO Scientific Authority would be required to obtain a CITES Export/Re-export permit to export walrus products internationally.

*Shared Stocks: Nunavik*
Harvesting of the Hudson Bay-Davis Strait and South and East Hudson Bay stocks occurs in both the Nunavut Settlement Area and Nunavik Marine Region. As there are no population abundance estimates for these two stocks, the existing regulatory regime and quotas identified in the *Fisheries Act* and the *Marine Mammal Regulations*, and provisions in the Nunavut Agreement and the Nunavik Inuit Land Claims Agreement would continue to apply.

*Shared Stocks: Greenland*
Some stocks of Atlantic walrus inhabit and are harvested in both Canadian and Greenland waters. As such, it is important that discussions on management and sustainable harvesting occur between the two countries.

# 5. Objectives

A number of objectives were established for the walrus fishery. Long term objectives guide the management of the fishery and may be categorized as stock conservation, ecosystem, shared stewardship and social, cultural and economic objectives. Each long term objective is supported by one or more short term objectives. Various co-management organizations may take the lead in developing specific actions to address certain objectives.

**Table 3. Long and Short-Term Objectives for the Walrus Fishery in the Nunavut Settlement Area**

| **Objectives** | |
|---|---|
| **Long-term:** | **Short-term:** |
| ***Stock Conservation*** | |
| Maintain vital, healthy walrus stocks and populations through sustainable use and effective fishery management consistent with the wildlife harvesting and management provisions under the Nunavut Agreement. | • Improve knowledge of Atlantic walrus biology, abundance and distribution.<br>• Conduct surveys of remaining walrus stocks to obtain abundance estimates.<br>• Use local knowledge/TEK/IQ in aerial survey designs and use local community members in conducting the surveys<br>• Develop training materials for Inuit harvesters to maximize harvest and minimize losses.<br>• Develop communication materials to inform elders, harvesters and community members on research methods, activities and results.<br>• Develop/enhance monitoring program to reduce struck and lost, including an assessment of harvesting methods and equipment, and collection of data on rates of struck and loss. |
| Take a precautionary approach to fishery decisions for walrus stocks or populations. | • Given uncertainties related to walrus stocks, take a precautionary approach to establishing TAHs and BNLs for each walrus stock or population. |
| ***Ecosystem*** | |
| Protection of walrus habitat. | • Continue to identify and document traditional ecological knowledge of important walrus habitats.<br>• Investigate and assess threats resulting from human activities (e.g. shipping |

| | |
|---|---|
| | routes, sonar, noise disturbance, and tourism).<br>• Support research into the effects of invasive species on walrus and walrus habitat. |
| ***Shared Stewardship*** | |
| Promote collaboration, participatory decision-making and shared responsibilities with resource users, co-management organizations and other stakeholders. | • Conduct IFMP evaluations with walrus working groups.<br>• Develop sport hunt guidelines.<br>• Develop appropriate guidelines for activities that could negatively affect walrus Once TAH/BNLs are established for walrus stocks, co-management organizations to implement the shared responsibilities in accordance with land claims agreements, the *Fisheries Act*¸ and its regulations.<br>• Develop and/or participate in more formalized discussions with Greenland on the management of shared stocks. |
| ***Social, Cultural and Economic*** | |
| Promote traditional Inuit harvesting techniques and practices within communities. | • Develop and/or enhance training programs for inexperienced hunters. |
| Promote and maintain vital, healthy, walrus populations capable of sustaining harvesting needs. | • Increase awareness of the importance of walrus to public, communities, and stakeholders.<br>• Include IQ in all policies and program development.<br>• Promote territorial health programs aimed at food safety. |
| Maintain access to international markets for the export of walrus products. | • Demonstrate harvest levels and practices are sustainable.<br>• IFMP in place. |
| ***Compliance*** | |
| Support effective fisheries management through a defined compliance program. | • Conduct a risk assessment of compliance issues.<br>• Develop a variety of compliance activities and tools to address the identified risks.<br>• Support Communities in the development of by-laws related to walrus or activities that may affect walrus. |

# 6. Access and Allocation

Upon ratification of the NA in 1993, all existing restrictions or quotas on the amount of wildlife that could be harvested within the NSA were retained and deemed to have been established by the NWMB.

## 6.1 Where a Total Allowable Harvest ***has not*** been established

Unless a TAH has been established, an individual Inuk may harvest up to four (4) walrus in a year without a licence (MMR s. 6(1) (c)), except where community quotas exist (MMR s.26). Annual quotas have been set for the communities of Coral Harbour (60), Sanikiluaq (10), Arctic Bay (10) and Clyde River (20).

### *6.1.1 Sport Hunt*

Marine Mammal Fishing Licences may be issued for non-beneficiaries to participate in walrus sport hunts (MMR s.4) provided there is support from the local HTO and annual approval from the NWMB based on its *Interim NWMB Sport Hunt Policy*. Sport hunters must provide detailed harvest reporting directly to DFO. The full Walrus Sport Hunt Policy can be found in Appendix 3.

### *6.1.2 Harvest Reporting*

Harvest information is provided by Inuit hunters to the HTOs, which is then relayed to DFO (MMR s. 17; *Fisheries Act* s. 61; NA s. 5.7.43). Appendix 1 provides information on annual quotas and landed catch for communities that have harvested walrus. These numbers are not corrected for hunting losses. A Fishery Officer will notify the community and HTO when the quota has been reached and will close the fishery (MMR s. 12, 26).

## 6.2 Where a Total Allowable Harvest ***has*** been established:

The NWMB is in the process of establishing Total Allowable Harvest (TAH) levels and Basic Needs Levels (BNL) for walrus. In 2013, the Minister of Fisheries and Oceans accepted the NWMB's decision to establish the BNL for beluga, narwhal and walrus in the NSA to be equal to the levels of TAH for those species. Therefore, since the BNL is the first demand on the TAH, Inuit will always have the right to the entire TAH. RWOs and HTOs are responsible for allocating this BNL/TAH, as well as regulating harvesting practices and techniques among their members, including the use of NQLs.

Article 40 of the NA will be considered for other Inuit or aboriginal groups that may demonstrate traditional use of walrus in the NSA.

### *6.2.1 Total Allowable Harvests*

Total Allowable Harvest levels have been established for the following stocks:

**Table 4. Total Allowable Harvests established for walrus stocks/management units in the eastern Canadian Arctic**

| Population | Stock/ Management Unit | Harvesting Community | TAH | Community Harvest Level |
|---|---|---|---|---|
| High Arctic | Baffin Bay /AW-01 | Grise Fiord | To be established | |
| | West Jones Sound / AW-02 | Grise Fiord | To be established | |
| | Penny Strait- Lancaster Sound /AW-03 | Arctic Bay<br>Pond Inlet<br>Resolute | To be established | |
| Central Arctic | Foxe Basin / AW-04 | Hall Beach<br>Igloolik | To be established | |

*see Figure 2 for a map of Atlantic walrus by stocks and management units.

### *6.2.2 Allocation of the TAH:*

As identified in the NA, the RWOs will be responsible for allocating annual regional BNL, which in the case of walrus will be the TAH, to their respective community HTOs, regulating their members and fulfilling other wildlife co-management obligations in accordance with the NA. The community HTOs will be responsible for allocating and enforcing the community BNL (community harvest limit) among members, and generally the management of harvesting among members (see Figure 3).

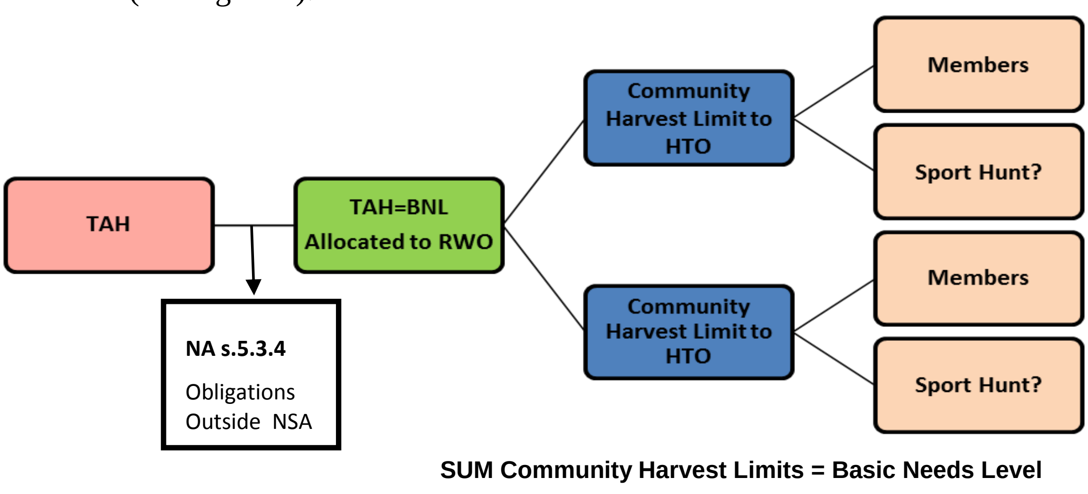


**Figure 3. Allocation of the Total Allowable Harvest (TAH) and Basic Needs Level (BNL)**

**Where a TAH has been established for a walrus management unit, the combined annual community harvest limits for that management unit shall not exceed the TAH.**

*6.2.3 Sport Hunt*

An assignment under section 5.7.34 (b) of the NA is used to authorize walrus sport hunts to a person qualified to harvest walrus under the laws of general application. Under this section, a person authorized to harvest walrus under a licence may be assigned part or all of a share of the total allowable harvest by an Inuk, RWO or HTO. Through the assignment provisions, an Inuk, an HTO or a RWO may assign its share of the TAH to a walrus sport hunt, if so desired, so long as the established annual total allowable harvest for that particular management unit is not exceeded.

An assignment under Article 5 of the NA must be evidenced by documentation containing information on both the assignor, and the assignee. Once the required documentation is received by DFO, the Minister may issue a Walrus Marine Mammal Fishing Licence (MMR s.4). The full Walrus Sport Hunt Policy can be found in Appendix 3.

*6.2.4 Post-Harvest Walrus Tag*

**For management units where a TAH has been established.**

The Post-Harvest Walrus Tag is an important management tool for RWOs and HTOs to be able to allocate and account for harvesting among their members. Where a TAH has been established, DFO will issue Post-Harvest Walrus Tag to the RWO and/or HTOs in the amount equal to the annual harvest level for the corresponding management unit. Post-Harvest Walrus Tags will be allocated by the RWO/HTO and will be proof of allocation to a share of one walrus from the walrus TAH for a particular management unit. This forms part of the walrus management system in which RWOs and HTOs decide on community allocations, in the form of community harvest limits.

The Post-Harvest Walrus Tag is not a licence to hunt and will be issued without fee or administrative charge. A Walrus Harvest Tag system will assist in:

- Evidencing a person’s authority to harvest/possess wildlife appropriate to the particular Management Unit;
- Regulating the allocation of a share of TAH, including the BNL, as allocated by the RWO and/or HTO;
- Collecting information in relation to harvesting activities;
- Regulating harvesting activities in relation to sport hunt assignment.

*6.2.5 Harvest Reporting and Monitoring*

Hunters provide information on their hunts to their HTO. HTOs will provide the information to the RWO and DFO in a timely manner. A Fishery Officer will notify the community and HTOs when the harvest level has been reached for a management unit and will close the fishery (MMR s. 12, 26).

- Harvest information must be reported (MMR s. 17; Fisheries Act s. 61; NA s. 5.7.43):

# 7. Management Measures for the Duration of the Plan

The management measures identified in the IFMP outline the controls or rules adopted for the walrus fishery for the purposes of stock conservation and sustainable management. These measures are based on the *Fisheries Act, the Marine Mammal Regulations* and the NA.

The *Marine Mammal Regulations* (MMR) include provisions related to the hunting, movement, and sale of walrus products. These provisions include requirements for hunters to hunt a walrus in a manner that is designed to kill it quickly, to make reasonable efforts to retrieve a killed or wounded walrus without delay and to have all necessary equipment on hand to retrieve it. Abandoning, discarding or wasting edible parts of walrus is prohibited.

Domestic movement of walrus products requires a DFO Marine Mammal Transportation Licence. Indians or Inuit who land walrus in one jurisdiction and are returning to their home in another jurisdiction are exempted from this requirement. International trade of walrus products requires a CITES) Export/Re-export Permit.

A full list of the management measures can be found in Appendix 2.

# 8. Shared Stewardship Arrangements

The Atlantic walrus IFMP was initiated and developed by the Foxe Basin Walrus Working Group in 2007 and the High Arctic-Baffin Bay Walrus Working Group in 2009. Participation on the Working Groups includes representatives from each of the HTOs, the Qikiqtaaluk Wildlife Board (co-chair), NTI and DFO. Staff from the NWMB have attended Working Group meetings when possible. The Working Groups invite subject-matter experts to provide additional information in the development of the IFMP as required. This has included representatives from the mining industry and community elders.

The Walrus Working Groups produced Terms of References to help guide the development of the IFMP. Meetings have been held in the communities of Resolute, Grise Fiord, Arctic Bay, Pond Inlet, Hall Beach and Igloolik to obtain the views of elders and community members on issues related to walrus management, including the identification of fishery issues and long and short term objectives for the fishery.

There are a number of different ways that the objectives for the fishery may be achieved, such as the effective implementation of the management measures identified in Appendix 2. Other measures may be initiated by co-management organizations through the development of by-laws or guidelines. Once developed, these would be included as an Appendix of the IFMP.

# 9. Compliance Plan

The Conservation and Protection program promotes and maintains compliance with legislation and regulations implemented to achieve the conservation and sustainable use of Canada's aquatic resources, and the protection of species at risk, fish habitat and oceans. Conservation and Protection works closely with internal partners to evaluate risks to fish and fish habitat to ensure program delivery meets Departmental objectives.

Fishery Officers monitor fishing and related activities to ensure compliance with the *Fisheries Act* and its regulations as well as several other federal statutes. Fishery Officers investigate violations of these acts and regulations and resolve them by applying various compliance options.

**Regional Compliance Program Delivery**

Fishery Officers in the Eastern Arctic Area monitor the Atlantic walrus fishery and the trade of Atlantic walrus products for compliance with the MMR which are made pursuant to the *Fisheries Act*. Conservation and Protection works closely with internal and external partners to consult on and or resolve compliance issues.

Fishery Officers promote compliance with regulations by working with user groups (e.g. hunters and buyers) and other stakeholders to better understand the laws. Fishery Officers engage hunters and people involved in the marine mammal trade industry to provide information that increases awareness and helps address compliance and conservation concerns in the Atlantic walrus fishery. Increased education and awareness will help protect the legal market and trade of Atlantic walrus ivory and parts.

**Current Compliance Issues**

Specific concerns may arise from: failing to follow conditions of licence for the sport hunt, non-reporting or misreporting of harvest, wastage, illegal harvest or illegal trade and exporting of Atlantic walrus ivory and or parts. Patrols have been conducted in Atlantic walrus hunting areas and communities to monitor these concerns.

**Compliance Strategy**

Conservation and Protection collaborates with internal and external partners to identify and prioritize compliance issues and works with resource managers to address them.

Fishery Officers focus efforts on:

- compliance with legislation, including sport hunt licence conditions;
- tusk traceability / illegal trade of ivory tusks;
- licence inspections.

Operational Activities include:

- Monitoring of Atlantic walrus sport hunts;
- Education of user groups and stakeholders;
- Inspections of Atlantic walrus products from harvest to export;

- Cross reference of harvest data with trade data;
- Liaise with Nunavut Conservation Officers and other territorial or provincial law enforcement agencies.

**Table 5. Compliance Focus and Strategies for Atlantic Walrus in the Nunavut Settlement Area**

| COMPLIANCE FOCUS | | |
|---|---|---|
| Issue | Regulation | Strategy |
| Monitor harvest and enforce regulations | MMR: Sections 6, 7, 8, 9, 10, 11, 13, 15, 17, 25 and 26 | • Hunt monitoring<br>• Inspections<br>• Licences |
| Harvest reporting and quota compliance | MMR: Sections 6, 12, 17 and 26 .<br>Fishery (General) Regulations: Sections 6, 7, 9, 11, 15 and 22 | • Inspections<br>• Licence cross referencing and issuance<br>• Variation Orders |
| Tusk traceability | MMR: Sections 15 and 16 | • Inspections |

## 10. Performance Review

This Atlantic walrus IFMP was developed through an extensive consultative process including the NWMB, NTI, RWOs, HTOs, walrus hunters and community members. DFO will continue to consult with these groups throughout the life of this IFMP as circumstances require.

Annual post season review sessions will be conducted with co-management organizations and as circumstances require. Progress on achieving the short term objectives and effective implementation of management measures identified in the Plan will be reviewed. Recommendations to improve management of the walrus fishery will be developed to meet the long term objectives of maintaining a sustainable walrus fishery.

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## Glossary of Terms

Abundance: Number of individuals in a stock or a population.

Basic Needs Level (BNL): Means the level of harvesting by Inuit identified in Sections 5.6.19 to 5.6.25 of the Nunavut Agreement.

Committee on the Status of Endangered Wildlife in Canada (COSEWIC): Committee of experts that assess and designate the conservation status of species that may be at risk in Canada.

Convention on International Trade in Endangered Species (CITES): An international agreement to ensure that international trade in specimens of wild animals and plants does not threaten their survival.

Harvest Limit: A maximum number of walrus permitted to be landed by a community or from a stock/ management unit in a given time period.

Inuit Qaujimajatuqangit: Is a body of knowledge and unique cultural insights of Inuit into the workings of nature, humans and animals.

Marine Mammal Regulations (SOR/93-56): Federal regulations under the *Fisheries Act* that govern the management and control of fishing for marine mammals and related activities in Canada or in Canadian fisheries waters.

Marine Mammal Fishing Licence: Licence required to fish for marine mammals under the Marine Mammal Regulations (s. 5).

Marine Mammal Transport Licence (MMTL): Licence required for transport of marine mammal parts and products from one province (or territory) to another.

Non-quota Limitation (NQL): Means a limitation of any kind, except a total allowable harvest, and may include a limitation on season of harvest, sex of wildlife, size of wildlife, age of wildlife or method of harvest.

Population: A reproductively isolated group of animals, sharing a habitat.

Potential Biological Removal (PBR): A statistical method currently used by DFO Science to provide recommendations on sustainable harvest levels.

Precautionary Approach (PA): Applying caution to management actions when scientific knowledge is uncertain and not relying on the absence of adequate scientific information as a reason to postpone action to avoid serious harm to wildlife stocks or their ecosystems.

Quota: The number of walrus that can be harvested by a community, as set out in Column 1, Section 26, or by an individual, as per Section 6. (1)(c) of the *Marine Mammal Regulations*.

Species at Risk Act (SARA): The Canadian Act to prevent wildlife species from becoming extinct and secure the necessary actions for their protection and recovery in Canada.

Stock: Refers to a resource management unit. For walrus, it refers to a geographically segregated group of animals that are subject to hunting.

Total Allowable Harvest (TAH): For a stock or population this means an amount of wildlife able to be lawfully harvested as established by the NWMB pursuant to Sections 5.6.16 to 5.6.18 of the NA.

Total Allowable Landed Catch (TALC): A sustainable harvest level recommendation for a stock or population developed by applying an estimate of harvest loss rates as a correction factor in the PBR calculation.

Traditional Ecological Knowledge (TEK): A cumulative body of knowledge handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment. Inuit hold traditional knowledge on walrus.

# Appendix 1. Landed Catch (Subsistence Harvest and Licenced Sport Hunts) of Walrus in Nunavut 2000-2016

| Area of Harvest (Stock and Management Unit) | Quota ¥ | | 2000/01 | | 2001/02 | | 2002/03 | | 2003/04 | | 2004/05 | | 2005/06 | | 2006/07 | | 2007/08 | | 2008/09 | | 2009/10 | | 2010/11 | | 2011/12 | | 2012/13 | | 2013/14 | | 2014/15 | | 2015/16 | | 2016/17 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Settle-ment | Individ-ual | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb | Sp | Sb |
| ***Hudson Bay- Davis Strait (AW-05)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Clyde River | 20 | | -- | 0 | -- | 1 | -- | 0 | -- | 0 | -- | 2 | -- | NR | -- | 1 | -- | 0 | -- | NR | -- | NR | -- | NR | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 3 | | 0 |
| Qikiqtarjuaq | | 4 | -- | 0 | 0 | 1 | -- | 33 | -- | 1 | -- | 0 | 0 | NR | NR | 9 | -- | 6 | -- | NR | -- | NR | -- | 6 | -- | 5 | -- | 10 | -- | 0 | -- | 0 | -- | 7 | | 4 |
| Pangnirtung | | 4 | -- | 15 | -- | 19 | -- | 9 | -- | 15 | -- | NR | -- | NR | -- | 15 | -- | NR | -- | 10 | 0 | NR | -- | NR | -- | NA | -- | 7 | -- | 0 | -- | 4 | -- | NR | | 25 |
| Iqaluit | | 4 | -- | 19 | -- | 7 | -- | 1 | -- | 1 | -- | NR | -- | 10 | -- | 9 | -- | 11 | -- | NR | -- | 14 | -- | 14 | -- | 14 | -- | 19 | -- | 6 | -- | 1 | -- | 11 | | 10 |
| Kimmirut | | 4 | -- | 0 | -- | 0 | -- | 4 | -- | 7 | 0 | 4 | -- | 6 | NR | 2 | -- | NR | -- | NR | -- | NR | -- | 7 | -- | 0 | -- | 1 | -- | 0 | -- | 2 | -- | 2 | | 3 |
| Chesterfeild In. | | 4 | -- | 4 | -- | NR | -- | NR | -- | 4 | -- | 3 | -- | 3 | -- | 0 | -- | 2 | -- | 0 | -- | NR | -- | NR | -- | 7 | -- | 4 | -- | 0 | -- | 15 | -- | 9 | | 5 |
| Cape Dorset | | 4 | 0 | 46 | 1 | 10 | 0 | 5 | -- | 1 | 0 | NR | 0 | 6 | NR | 25 | -- | NR | -- | NR | -- | NR | -- | 1 | -- | 2 | 0 | 0 | 0 | 0 | 0 | 0 | -- | 0 | | 2 |
| Coral Harbour | 60 | | 0 | 1 | 2 | NR | 2 | 28 | -- | 10 | -- | NR | 2 | 15 | 3 | 15 | NR | 4 | 4 | NR | 9 | 6 | 8 | NR | 4 | 7 | 3 | 12 | 7 | 15 | 7 | 15 | 7 | 20 | 9 | 42 |
| Repulse Bay | | 4 | -- | 1 | -- | NR | 0 | 20 | -- | NR | -- | 3 | -- | 6 | -- | 6 | -- | 12 | -- | NR | -- | 4 | -- | NR | -- | 0 | -- | 5 | -- | 0 | -- | 0 | | 12 | | 12 |
| Arviat | | 4 | -- | 1 | -- | NR | -- | 3 | -- | 5 | -- | NR | -- | 1 | -- | 0 | -- | 0 | -- | NR | -- | NR | 0 | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | | 0 | | 1 |
| Rankin Inlet | | 4 | -- | 7 | -- | NR | -- | 12 | -- | 2 | -- | 2 | -- | 3 | -- | 13 | -- | 6 | NR | 3 | -- | 6 | -- | 2 | -- | 4 | -- | 6 | -- | 0 | -- | 0 | | 15 | | 2 |
| Whale Cove | | 4 | -- | 0 | -- | NR | -- | 1 | -- | NR | -- | NR | -- | NR | -- | 0 | -- | 0 | -- | NR | -- | NR | -- | 0 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | | 0 | | 0 |
| **TOTALS** | | | **0** | **94** | **3** | **38** | **2** | **116** | **0** | **46** | **0** | **14** | **2** | **50** | **3** | **95** | **0** | **41** | **4** | **13** | **9** | **30** | **8** | **30** | **4** | **39** | **3** | **64** | **7** | **21** | **7** | **37** | **7** | **79** | **9** | **106** |
| **Total Reported Harvest (Sp + Sb)** | | | | **94** | | **41** | | **118** | | **46** | | **14** | | **52** | | **98** | | **41** | | **17** | | **39** | | **38** | | **43** | | **67** | | **28** | | **44** | | **86** | | **115** |
| ***Baffin Bay (AW-01) and West Jones Sound (AW-02)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Grise Fiord | | 4 | -- | 4 | -- | 2 | -- | 3 | -- | 7 | -- | 5 | -- | 2 | -- | 5 | -- | 4 | NR | NR | -- | 7 | -- | 2 | -- | 4 | -- | NR | -- | 0 | -- | 16 | | 1 | | **0** |
| **TOTALS** | | | **0** | **4** | **0** | **2** | **0** | **3** | **0** | **7** | **0** | **5** | **0** | **2** | **0** | **5** | **0** | **4** | **0** | **0** | **0** | **7** | **0** | **2** | **0** | **4** | **0** | **0** | **0** | **0** | **0** | **16** | **0** | **1** | **0** | **0** |
| ***Penny Strait - Lancaster Sound (AW-03)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Arctic Bay | 10 | | -- | 2 | -- | 2 | -- | 0 | -- | 0 | -- | 1 | -- | NR | -- | 0 | -- | 1 | -- | NR | -- | 0 | -- | 1 | -- | 0 | -- | 0 | -- | 0 | -- | 0 | | 0 | | 0 |
| Resolute Bay | | 4 | -- | 0 | -- | NR | -- | 1 | -- | 6 | -- | 4 | -- | 1 | -- | 0 | -- | 1 | -- | NR | -- | 2 | -- | 3 | 0 | 2 | -- | 2 | -- | 0 | -- | 1 | | 0 | | 0 |
| Pond Inlet | | 4 | -- | 5 | -- | 3 | -- | 0 | -- | 1 | -- | 0 | -- | 1 | -- | 0 | -- | 0 | -- | NR | -- | NR | -- | 3 | -- | 0 | -- | NR | -- | 0 | -- | 0 | | 1 | | 1 |
| **TOTALS** | | | **0** | **7** | **0** | **5** | **0** | **1** | **0** | **7** | **0** | **5** | **0** | **2** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **2** | **0** | **7** | **0** | **2** | **0** | **2** | **0** | **0** | **0** | **1** | **0** | **1** | **0** | **1** |
| ***Foxe Basin (AW-04)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Hall Beach | | 4 | 1 | 87 | 0 | 40 | 4 | 1 | 1 | 87 | NR | 66 | 3 | 75 | 4 | 100 | -- | 35 | -- | 33 | NR | 70 | 0 | 75 | 2 | 33 | 1 | 107 | 10 | NR | 2 | 92 | 11 | 36 | 6 | 110 |
| Igloolik | | 4 | 6 | 168 | 12 | 40 | 10 | NR | 14 | 97 | 10 | NR | 12 | 100 | 2 | 184 | NR | 54 | | 74 | -- | 89 | -- | 141 | 6 | 95 | 4 | 107 | 0 | NR | 0 | 9 | -- | NR | | 129 |
| **TOTALS** | | | **7** | **255** | **12** | **80** | **14** | **1** | **15** | **184** | **10** | **66** | **15** | **175** | **6** | **284** | **0** | **89** | **0** | **107** | **0** | **159** | **0** | **216** | **8** | **128** | **5** | **214** | **10** | **0** | **2** | **101** | **11** | **36** | **6** | **239** |
| **Total Reported Harvest (Sp + Sb)** | | | | **262** | | **92** | | **15** | | **199** | | **76** | | **190** | | **290** | | **89** | | **107** | | **159** | | **216** | | **136** | | **219** | | **10** | | **103** | | **47** | | **245** |
| ***Southand East Hudson Bay (AW-05)*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sanikiluaq | 10 | | -- | 1 | -- | 0 | -- | 15 | -- | 3 | -- | NR | -- | NR | -- | 2 | -- | NR | -- | 0 | -- | 2 | -- | 2 | -- | 2 | -- | 3 | -- | 0 | -- | 0 | | 1 | | 0 |
| **TOTALS** | | | **0** | **1** | **0** | **0** | **0** | **15** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **2** | **0** | **0** | **0** | **0** | **0** | **2** | **0** | **2** | **0** | **2** | **0** | **3** | **0** | **0** | **0** | **0** | **0** | **1** | **0** | **0** |
| ***Kitikmeot Region*** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Bathurst Inlet | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | NR | | NR | | NR | | NR | | NR |
| Cambridge Bay | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | 0 | | 0 | | 0 |
| Gjoa Haven | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | 0 | | NR | | NR |
| Kugaaruk | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | 0 | | 0 | | 3 |
| Kugluktuk | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | 0 | | 0 | | 0 |
| Taloyoak | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | 0 | | 0 | | 0 |
| Umingmaktok | | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | 0 | | 0 | | NR | | NR | | NR |
| **TOTALS** | | | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **0** | **3** |
| **NU Reported Totals** | | | **7** | **361** | **15** | **125** | **16** | **136** | **15** | **247** | **10** | **90** | **17** | **229** | **9** | **386** | **0** | **136** | **4** | **120** | **9** | **200** | **8** | **257** | **12** | **175** | **8** | **283** | **17** | **21** | **9** | **155** | **18** | **118** | **15** | **346** |
| **NU Total Reported Harvest (Sp + Sb)** | | | | **368** | | **140** | | **152** | | **262** | | **100** | | **246** | | **395** | | **136** | | **124** | | **209** | | **265** | | **187** | | **291** | | **38** | | **164** | | **136** | | **361** |
| **Salluit ~** | | | | | | | | | | | | | | | | **14** | | **24** | | **17** | -- | **7** | -- | **14** | | **11** | **0** | **NR** | **0** | **NR** | **0** | **NR** | **0** | **NR** | **0** | **NR** |

~ The Nunavik community of Salluit conducts licensed sport hunts within the Area of Equal Use and Occupancy described in S. 40 of the Nunavut Land Claims Agreement.
Salluit's sport hunts are licenced by the Eastern Arctic Area office.

(Legend on following page)

**Legend**:

| | |
|---|---|
| ¥ | see Marine Mammal Regulations (SOR/93-56) S. 6 (1)(c ), S. 6 (2)( c ), and S. 26. |
| Sp | Licensed Sport Harvest - a regulated sport hunt is conducted in some Nunavut communities. The NWMB reviews walrus sport hunt applications annually, and transmits its approval decisions to DFO. Approved sport hunts are conducted under DFO license and landings are reported to the DFO Eastern Arctic Area Office, Iqaluit. In cases where sport hunts were approved but not conducted, the landings are reported as '0'. 'NR' if information has not yet been received |
| Sb | Subsistence Harvest - 'NR' indicates the community has not reported its subsistence walrus harvest. DFO compiles information on subsistence walrus harvests by telephone calls to community Hunters and Trappers Organizations, or the local Government of Nunavut Wildlife Officers. |
| '-- ' | Community does not conduct sport hunts |
| Notes | |
| | Cresswell Bay is associated to Resolute Bay - there used to be hunt camps there |
| | Pangnirtung Subsistence harvest 2001 was originally reported as 19 +/- 1; this value was replaced with the average (19) |
| | Coral Harbour Subsistence harvest 2002 was originally reported as 25-30; this value was replaced with the average (28). |
| | Coral Harbour Subsistence harvest 2009 was originally reported as 5-6; this value was replaced with the average (6). |
| | Qikiqtarjuaq Subsistence harvest 2010 was orginally reported as 5-6; the value was replaced with the average (6). |
| | Hall Beach Subsistence harvest 2010 was orginally reported as 70-80; the value was replaced with average (75). |
| | Qikiqtarjuaq Subsistence harvest 2011 was orginally reported as 4-5; the value was replaced with average (5). |
| | Hall Beach Subsistence harvest 2011 was originally reported as 30-35; the value was replaved with average (33). |
| | Igloolik HTA implemented a two year moratorium on walrus sport hunts and tourism. Decision was made November 30, 2007. |
| Harvest season runs from April 1 to March 31 | |

**Appendix 2. Overview of Current Management Measures for the Atlantic Walrus Fishery in the Nunavut Settlement Area**

| **Management Measure** | **Applicable Legislation/ Regulation** |
| --- | --- |
| Harvest Levels | • Unless a TAH is in place, an Inuk may, without a licence, fish for food, social or ceremonial purposes for four (4) walrus in a year except where community quotas exist (Coral Harbour (60), Sanikiluaq (10), Arctic Bay (10) and Clyde River (20)). (MMR, s. 6 and 26).<br>• Where a TAH has been established, annual harvest may not exceed the total allowable harvest level established for a particular management unit. |
| Monitoring and Reporting | • Harvest information must be reported (MMR s. 17; Fisheries Act s. 61; and the NA s. 5.7.43).<br>• When the quota or total allowable harvest level is reached, the community will be notified and the fishery will be closed (MMR s. 12 and 26). |
| Licences | • The Minister may issue a marine mammal fishing licence (MMR s. 4).<br>• The Minister may issue a licence for certain activities such as for tagging (satellite tracking), live capture, biopsies (MMR s. 11). |
| Post-Harvest Walrus Tag | • Where a TAH has been established, DFO will issue Post-Harvest Walrus Tags to the RWO and/or HTOs in the amount equal to the annual harvest level for the corresponding management unit. These tags will be issued without fee or administrative charge and are not to be considered a licence to hunt. |
| Humane Harvesting | • Hunters shall only kill a walrus in a manner that is designed to kill it quickly (MMR s. 8).<br>• No person shall disturb a walrus except when hunting for walrus (MMR s. 7). |
| Reducing Loss Rates | • Hunters must have all necessary equipment on hand to retrieve a hunted walrus (MMR s. 9).<br>• Hunters that kill or wound a walrus must make all reasonable efforts to retrieve it without delay, must not abandon or discard it, or waste any edible part of a walrus (MMR s. 10).<br>• Hunters are to use a rifle or shotgun with the following restrictions: a) a rifle and non-full metal jacketed ammunition that produce a muzzle energy of not less than 1,500 foot pounds; or b) a shotgun and rifled slugs that produce a muzzle energy of |

| | |
|---|---|
| | not less than 1,500 foot pounds (MMR s. 25). |
| Sale and Transportation | • A Marine Mammal Transportation Licence is required to transport walrus or walrus parts from one province to another (MMR s. 16).<br>• A CITES Export Permit is required to transport walrus products outside of Canada. |
| Habitat/Ecosystem Protection | • *Fisheries* Act s. 35: prohibits any person from carrying on any work, undertaking or activity that results in serious harm to walrus that are part of a commercial, recreational or Aboriginal fishery, unless authorized by the Minister. |

## Appendix 3. Walrus Sport Hunt Policy in the Nunavut Settlement Area

### A. Where a Total Allowable Harvest has been established for a walrus stock or population

Where the Nunavut Wildlife Management Board (NWMB) and the Minister of Fisheries and Oceans Canada (DFO) establish a total allowable harvest (TAH) for a stock or population of walrus in the Nunavut Settlement Area (NSA), the assignment provisions of the Nunavut Agreement (NA) shall be used to assign part or all of the TAH to a walrus sport hunt.

In 2013, the Minister of DFO accepted the NWMB's decision to establish the basic needs levels (BNL) for beluga, narwhal and walrus in the NSA to be equal to the levels of total allowable harvest (TAH) established or modified by the NWMB. As per the NA, Hunters and Trappers Organizations (HTO) and Regional Wildlife Organizations (RWOs) are responsible for allocating their community's and regional TAH to their members and the assignment to non-members (e.g. walrus sport hunt) (s. 5.7.3 and 5.7.6).

An assignment under section 5.7.34 (b) of the NA is used to authorize walrus sport hunts to a person qualified to harvest walrus under the laws of general application, so long as the established annual total allowable harvest for that particular management unit is not exceeded.

Under sections 5 and 6 of the Marine Mammal Regulations, no person other than an Indian, Inuk, or beneficiary, may fish for walrus except under the authority of a licence.

If an HTO wishes to assign part or all of a share of their community's allocation of the TAH for walrus sport hunting purposes, the following process will be undertaken to obtain a valid Marine Mammal Fishing Licence prior to engaging in walrus hunting activities:

The HTO will:

1. Complete and submit the Sport Hunt Application package to DFO.

2. Upon receiving the completed documents and payment of fee, the Minister of DFO may issue a Marine Mammal Fishing Licence for walrus pursuant to section 4(1) of the Marine Mammal Regulations.

3. All conditions identified on the Marine Mammal Fishing Licence must be followed by the assignee (sport hunter). The Marine Mammal Regulations (MMR) include provisions related to the hunting, movement, and sale of walrus products. These provisions include requirements for hunters to report on harvesting activities, to collect biological samples, to hunt in a manner that is designed to kill the walrus quickly, to make reasonable efforts to retrieve a killed or wounded walrus without delay and to have all necessary equipment on hand to retrieve it. Abandoning, discarding or wasting edible parts of walrus is prohibited.

4. Any HTO by-laws that are in place governing walrus hunting will also be followed by the assignee (sport hunter).

5. A DFO Marine Mammal Transportation Licence is required to transport walrus or walrus parts from one province to another (MMR s. 16(1)). These are free and available from a DFO Fishery Officer or from the community's local Conservation Officer.

6. Anyone wishing to export walrus parts or derivatives from Canada must obtain an export permit from the Canadian CITES administration. These permits can take several weeks to obtain. For more information, contact the DFO CITES Permitting Officer at: (888) 641-6464.

## B. Where a TAH <u>has not</u> been established for a walrus stock or population

Each year the Nunavut Wildlife Management Board (NWMB) requests applications (Request to Conduct Walrus Sport Hunts) from communities and individuals for walrus sport hunts. These applications are reviewed by the NWMB according to its Interim Policy for Walrus Sport Hunts. Decisions of the NWMB are forwarded to the Minister of Fisheries & Oceans Canada (DFO). If approved, and upon payment of fee, the Minister will provide the applicant with a Marine Mammal Fishing Licence under section 4(1) of the Marine Mammal Regulations. The process is detailed in the steps below:

1. Request to conduct walrus sport hunt:

Each fall, the NWMB seeks applications from individuals and communities who wish to conduct walrus sport hunts for the following walrus harvesting season (April 1-March 31). Applicants are required to submit a completed "Request to Conduct Walrus Sport Hunt" form that includes information on the hunt plan, outfitter information, a safety plan, and evidence of support from the local HTO.

2. NWMB review of applications:

The NWMB reviews the Requests to Conduct Walrus Sport Hunts against its Interim Policy for Walrus Sport Hunts. This Policy seeks to consider conservation concerns, health and safety, humane harvesting and minimization of waste, and long-term economic, social and cultural interests of Inuit harvesters, in making sport hunt decisions.

3. NWMB decision to DFO:

Decisions of the NWMB in relation to the walrus sport hunt are forwarded to the Minister of DFO as per the NA. Additional conditions may be included with the NWMB decision, such as the assignment of each walrus to a sport hunter is made in writing and that individuals applying for walrus sport hunts obtain written support from their local HTO.

4. DFO review:

The decisions of the NWMB are forwarded to the Minister of DFO for review. If approved, DFO will notify successful applicants. Upon receiving the completed "Assignment Document", "Hunter Information Sheet", and payment of fee, the Minister of DFO will issue a Marine Mammal Fishing Licence for walrus pursuant to section 4(1) of the Marine Mammal Regulations.

5. Marine Mammal Fishing Licence:

All conditions identified on a Marine Mammal Fishing Licence must be followed. Such conditions include: when and where the hunt is authorized to take place, by whom, their country of origin, quotas, gear type to be used, as well as any specific conditions related to the hunt, such as the reporting of all hunts to the local DFO office, firearm muzzle velocity requirements, the total number of strikes allowed, as well as biological sampling requirements.

6. Any HTO by-laws that are in place governing walrus hunting should be followed by the sport hunter.

7. A DFO Marine Mammal Transportation Licence is required to transport walrus or walrus parts from one province to another (MMR s. 16(1)). These are free and available from a DFO Fishery Officer or from a local Conservation Officer.

8. Anyone wishing to export walrus parts or derivatives from Canada must obtain an export permit from the Canadian CITES administration. These permits can take several weeks to obtain. For more information, contact the DFO CITES Permitting Officer at: (888) 641-6464.

**Appendix 4. Geographic coordinates of boundaries for Atlantic walrus stocks within the Nunavut Settlement Area.**

| Population | Stock/ Management Unit | Point | x (Longitude) | y (Latitude) |
|---|---|---|---|---|
| **Marine waters enclosed by the following coordinates:** | | | | |
| **High Arctic** | **Baffin Bay** AW-01 | 1 | -54.24297530150 | 74.03754489970 |
| | | 2 | -54.24297530150 | 74.03754489970 |
| | | 3 | -54.24297530150 | 74.03754489970 |
| | | 4 | -54.24297530150 | 74.03754489970 |
| | | 5 | -54.24297530150 | 74.03754489970 |
| | | 6 | -54.24297530150 | 74.03754489970 |
| | | 7 | -54.24297530150 | 74.03754489970 |
| | | 8 | -54.24297530150 | 74.03754489970 |
| | **West Jones Sound** AW-02 | 1 | -84.96233489570 | 75.30730634850 |
| | | 2 | -84.96233489570 | 75.30730634850 |
| | | 3 | -84.96233489570 | 75.30730634850 |
| | | 4 | -84.96233489570 | 75.30730634850 |
| | | 5 | -84.96233489570 | 75.30730634850 |
| | | 6 | -84.96233489570 | 75.30730634850 |
| | | 7 | -84.96233489570 | 75.30730634850 |
| | | 8 | -84.96233489570 | 75.30730634850 |
| | **Penny Strait – Lancaster Sound** AW-03 | 1 | -73.49375430420 | 71.86979037450 |
| | | 2 | -73.49375430420 | 71.86979037450 |
| | | 3 | -73.49375430420 | 71.86979037450 |
| | | 4 | -73.49375430420 | 71.86979037450 |
| | | 5 | -73.49375430420 | 71.86979037450 |
| | | 6 | -73.49375430420 | 71.86979037450 |
| | | 7 | -73.49375430420 | 71.86979037450 |
| | | 8 | -73.49375430420 | 71.86979037450 |
| | | 9 | -73.49375430420 | 71.86979037450 |
| | | 10 | -73.49375430420 | 71.86979037450 |
| | | 11 | -73.49375430420 | 71.86979037450 |
| **Central Arctic** | **Foxe Basin** AW-04 | 1 | -70.57925897140 | 67.49418275430 |
| | | 2 | -70.57925897140 | 67.49418275430 |
| | | 3 | -70.57925897140 | 67.49418275430 |
| | | 4 | -70.57925897140 | 67.49418275430 |
| | | 5 | -70.57925897140 | 67.49418275430 |
| | | 6 | -70.57925897140 | 67.49418275430 |
| | | 7 | -70.57925897140 | 67.49418275430 |
| | | 8 | -70.57925897140 | 67.49418275430 |
| | **Hudson Bay – Davis Strait** AW-05 | 1 | -54.20362912320 | 71.39690545840 |
| | | 2 | -54.20362912320 | 71.39690545840 |
| | | 3 | -54.20362912320 | 71.39690545840 |

| Population | Stock/<br>Management Unit | Point | x<br>(Longitude) | y<br>(Latitude) |
|---|---|---|---|---|
| | | 4 | -54.20362912320 | 71.39690545840 |
| | | 5 | -54.20362912320 | 71.39690545840 |
| | | 6 | -54.20362912320 | 71.39690545840 |
| | | 7 | -54.20362912320 | 71.39690545840 |
| | | 8 | -54.20362912320 | 71.39690545840 |
| **Unknown** | **South and East Hudson Bay** AW-06 | 1 | -79.90028974730 | 60.68356082350 |
| | | 2 | -79.90028974730 | 60.68356082350 |
| | | 3 | -79.90028974730 | 60.68356082350 |
| | | 4 | -79.90028974730 | 60.68356082350 |
| | | 5 | -79.90028974730 | 60.68356082350 |
| | | 6 | -79.90028974730 | 60.68356082350 |
| | | 7 | -79.90028974730 | 60.68356082350 |
| | | 8 | -79.90028974730 | 60.68356082350 |
| | | 9 | -79.90028974730 | 60.68356082350 |
| | | 10 | -79.90028974730 | 60.68356082350 |

**Issue:** Brief update on DFO Science Program in specific updates will cover the summer field season of 2017
.

## Background:

Fisheries and Oceans Canada (DFO) Science conducts research in the Qikiqtaaluk Region of Nunavut by working closely with local Hunters and Trappers Organizations/Associations and communities. DFO consults with the communities and tries to meaningfully engage the communities in research questions, develop, planning and execution. It has been the practice and continues to be the practice that DFO consults by face-to-face meetings where all products (reports, presentations) are available in English and Inuktitut and an interpreter is hired for the meetings. Through these practices DFO has had the pleasure of working with communities on many successful research projects in the Qikiqtaaluk region. We wish to share brief updates from the field work competed this year on the current research projects in this region.

## Current Situation:

### MARINE MAMMALS

***Walrus***

DFO conducted a large-scale aerial survey to determine the abundance of Atlantic walrus across the central Arctic. The survey was a joint initiative with researchers from Central & Arctic and Quebec regions, and included observers from local communities. During the first 3 weeks of September, 3 planes covered the area from Clyde River, south along the eastern coast of Baffin Island, both the north and south shores of Hudson Strait across to western Hudson Bay. Photographs were taken of any walrus observed, and over the next year these will be counted to determine abundance estimates. DFO researchers also visited the communities of Igloolik and Hall Beach to provide updates to the HTOs and communities on Total Allowable Harvest of walrus.

### *Bowhead Whales*

From August 15 to 24, a field team conducted boat-based field work in Cumberland Sound out of Pangnirtung and collected skin biopsy samples and aerial photographs of bowhead whales. Biopsy samples were collected using crossbows and bolts equipped with floats and 40mm biopsy tips. Photographs were collected using a small quadcopter unmanned aerial system (UAS) the DJI Phantom 4. In total, 108 bowhead tissue biopsy samples and 1014 bowhead photographs were collected

### *Seals*

This spring we did a photographic/infrared aerial survey of seals in Eclipse Sound, Milne Inlet, and Navy Board Inlet, from June 6 to 11, using twin otter. All was successful. Combining last year and this year's results, we plan to publish findings and return to the community to share and discuss the results.

### *Killer Whales*

Boat-based crew used Arctic Bay as a base for two weeks in late August to conduct non-systematic survey of the Admiralty Inlet area with an emphasis on Kakiak Point where they held camp. Killer whales were observed; however the field crew was unable to approach them close enough to conduct photographic work. Considerable killer whale activity was recorded in the Eclipse Sound region (Pond Inlet) and a sighting database was developed that included photographs submitted from local people.

### *Beluga*

An aerial survey of beluga found in Cumberland Sound was conducted in July and August 2017. This survey was designed to include both hunters information and past science information on the summer range of beluga in Cumberland Sound. The survey covered high density areas (e.g. Kangila Fiord), Clearwater Fiord and was expanded towards to the mouth of the Sound. The HTO Chair Noah Mosesee attended all flights expect those over Clearwater Fiord. All strata were flown twice with Clearwater Fiord being flown 5 times - this repetition of flights adds confidence to the survey. The last abundance estimate for Clearwater Fiord Beluga was in 2014, this survey from 2017 will feed into the new abundance estimate scheduled for the end of 2018.

In addition to the aerial survey conducted in Pangnirtung, DFO lead research using UAS to photograph beluga whales in Clearwater Fiord. These photos were used to assess the possibility of photo-id studies on belugas. On 18 August 2017, 222 photographs of belugas were taken using the drone to evaluate the potential to use a small unmanned aerial system (sUAS) to survey the high concentration area typically occupied by beluga whales. Photographs were considered suitable for age class and body condition assessment but further analysis is required to assess use for photo-id. However, it was determined that the relatively large geographic size of the area used by belugas in Clearwater Fiord makes the use of a quadrotor impractical as a survey platform. Also, the quadrotor is not as stable a platform to collect imagery over a large area and the camera is not as good as the cameras in small fixed wing UAS.

## MULTISPECIES RESEARCH

### *EAT Program*

EAT (Ecosystem Approach in Tremblay), was a success! The following animals were tagged: 20 Narwhals, 31 sharks, 2 Ring Seals and more than 170 fish (Arctic Char, Arctic and Polar Cod, Forn Horn and Slimy Sculpin). The environmental data collected included: water conductivity, water temperature, water depth, and five hydrophones were deployed along with two ocean current trackers (ADCP). Additionally, biomass estimates of primary food sources were completed – specifically we were able to collect data on zooplankton and fish. This research was only a success because of the support from the community of Pond Inlet, local Inuit researchers and collaborations outside of DFO (Parks Canada, GN, Ocean Wise, WWF, Winnipeg Zoo, University of Calgary, University of Windsor, York University, UQAR, Golder and University of Montreal). The field camp had a total of over 40 participants that came and went over the course of the fieldwork. The Inuit researchers who were trained in tagging throughout the field camp successfully tagged 15 Narwhal, 20 sharks and 30 fish by themselves.

### *Aquatic Invasive Species*

Experimental research on risks associated with domestic ballast (currently unregulated in Canada) is finished and published (MSc Theses). Recommendations based on this research are currently being brought forward for consideration by Transport Canada in the development of revised ballast water regulations this year.

Screening level risk assessment using Canadian Marine Invasive Screening Tool (CMIST) completed on a suite of 30 species considered to have potential for invading the Arctic. Species distribution modelling is underway on highest risk invasive species (identified through screening level risk assessment) to evaluate potential geographic locations in the Arctic with environmental suitability under current and future climate change scenarios. Initial results from a subset of 8 benthic species were recently published in the journal *Bioinvasions*.

There is ongoing research on developing a basis for a standardized monitoring and early detection program in the Canadian Arctic through development of environmental DNA (eDNA) as a potential tool for monitoring species introductions and shifts in biodiversity. Field work in and around the Milne Inlet port was conducted in August 2017 by DFO, University collaborators and 4 locally hired Inuit youth to characterize native and introduced biodiversity. This included collection of water samples for eDNA analysis, sampling of benthos, sampling for zooplankton and phytoplankton, and collection of CTD profiles on water quality as well as more detailed testing on effects of season and tidal cycles on efficacy of eDNA recovery.

Prior to conducting the field work, training workshops were held in Pond Inlet with local Inuit Youth who have an interest in environmental monitoring (January and August 2017). A subset of these youth participated in field work and are continuing to carryout data collection through the fall in support of eDNA research and community-based biodiversity monitoring. Hiring and workshops were coordinated through the Mittimatilik HTO and Ikaarvik.

This research on Aquatic Invasive Species will help in identifying key high risk areas and species for the coastal marine region of Baffin Island and marine waters adjacent to the Nunavut. Additionally, this research will help develop a cost-effective mechanism for regular monitoring at high risk port sites that involves the development of user-friendly sampling approaches and training/engagement at the community level. This information will enable further monitoring programs for invasive species in order to maintain the integrity of coastal marine ecosystems which are critical to the production and survival of harvested fish and marine mammal stocks in Nunavut.

### *Coastal Environmental Baseline Program*

Iqaluit has been selected as the Arctic pilot site for this initiative. The baseline data collection program will be developed through engagement with northern partners.

**FISH**

### *Arctic Char*

We were not able to complete Stock Assessment research in Cumberland Sound this year due to contracting issues within DFO. We look forward to speaking with the new HTO board in January about winter research ideas and continuing plans for Arctic Char Stock Assessment summer research in 2018.

The Stock Assessment Arctic Char research in Pond Inlet was a great success – we were able to collect samples from 200 fish from Koluktoo and Saatut, along with catch effort information and environmental data. Local fishers and youth were hired by the HTO to assist with the field research and be trained in fish sampling protocols. The Pond Inlet research was developed in collaboration with Pond Inlet; interviews, community meetings and HTO meetings were done in advance of research being developed. This current model of community engagement is on-going for this research with interviews of local fishers being planned for winter 2018.

We have a community-based Stock Assessment monitoring program running in Qikiqtarjuaq, but the timing for this fishing is the fall and winter. This research was developed in collaboration with the community of Qikiqtarjuaq and the Nattivak Hunters and Trappers Organization. We held meetings to discuss areas of concerns or interest for the community. The research question was developed in collaboration with the community to meet community concerns, interests and needs. In addition to the meetings, we interviewed fishers for their knowledge. This information was published as a DFO document (available on-line). DFO continues to work collaboratively with Qikiqtarjuaq on this research and we look forward to updating the Board in the future on the data collection for 2017/18 by email and if possible at a meeting.

Sylvia Grinnell Arctic Char project was a huge success! The Amaruq HTO, DFO and community field assistants worked together to collect the following data: stock assessment biological samples and catch effort information on 211 Arctic Char from Sylvia Grinnell; deployed and monitored a DIDSON that recorded the August migration of Arctic Char up the Sylvia Grinnell River (11 days); collected environmental data and ran an exhaustive creel survey on both anglers and gillnetters (121 creel surveys). Three technicians were hired through the HTO to help with the research, one was a returning employee from last summer and two were 1st year students from the Environmental Technology Program. We look forward to working with the Amaruq HTO over the winter to plan for next the field season.

Cambridge Bay Arctic Char program had a very successful summer field season in 2017. We were able to retrieve and redeploy 100% of our acoustic equipment in 2017 in both marine and fresh water environments. An additional 17 receivers were added to the Ferguson Lake acoustic array to help us understand what char do when they return to freshwater to overwinter. These receivers will also help us understand behaviour of post-spawning char and how this species interacts with lake trout in fresh water habitats,

We were able to collect juvenile and spawning samples from three additional lakes in the Ferguson lake system for subsequent genetic analyses. 70 additional Arctic char and 30 lake trout were also tagged in the Ferguson Lake system

All told, our study will address key challenges in the current management of this important fishery relating to dispersal and stock mixing, provide information on critical freshwater and marine habitats and provide detailed information on the timing of migrations between these habitats all of which will provide important baselines in the face of climate change. This work continues to build on an already existing research program in the region that has tracked the marine migrations of Arctic char since 2013, and offers the opportunity of ensuring the continued operation of the longest uninterrupted acoustic telemetry program monitoring Arctic char in Canada.

**Prepared by:** Z. Martin, Aquatic Science Biologist, DFO Iqaluit, Dr. Steve Ferguson, Dr. Marianne Marcoux, Dr. Cory Matthews, Dr. Kimberly Howland, Dr. Paul Blanchfield, Les Harris and Dr. R. Tallman, Research Scientist, DFO Winnipeg.

**Reviewed by:** Dr. Robert Young and Dr. Lianne Postma, DFO Winnipeg.

**Date:** October 17, 2017

SUBMISSION TO THE NUNAVUT WILDLIFE MANAGEMENT BOARD

FOR

Information: **Decision: X**

**Issue:** Downlisting of Peary Caribou from Endangered to Threatened.

**Background:**


GN - Morgan Anderson

- In October 2016 the Committee on the Status of Wildlife in Canada (COSEWIC) provided a re-assessment of Peary Caribou to the federal Minister of the Environment. This begins the formal listing process under the federal *Species at Risk Act*.
- Peary Caribou, which are currently listed under the federal SARA as Endangered, have been re-assessed by COSEWIC in a lower risk category as Threatened.
- A recovery strategy is required for both Endangered and Threatened species. If Peary Caribou are downlisted under the federal SARA, a recovery strategy will still be required and it will not affect the current recovery strategy development process currently underway for Peary Caribou
- Community consultations on the proposed downlisting of Peary Caribou were held with hunters and trappers organizations (HTOs) and regional wildlife boards in the range of Peary Caribou between June and August 2017. Organizations were asked to provide their formal position on the proposed downlisting and with any other comments, concerns or information that they feel should be considered.
- Consultation packages, in Inuktitut and English, were sent by mail and email. They included: a letter, information on the assessment and a questionnaire/response form. Follow-up calls to the HTOs and RWBs were made on September 27, 2017.
- Results of Consultation:

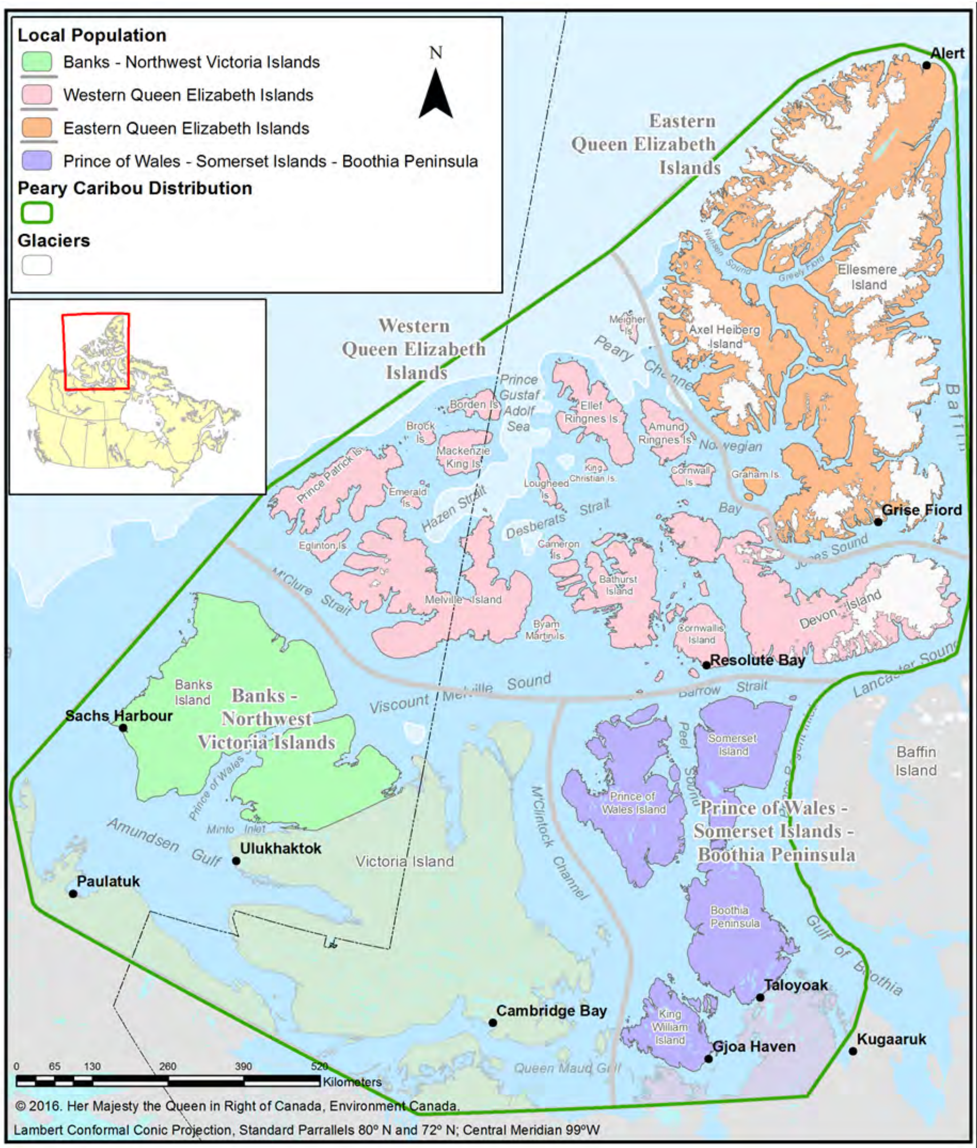
| | |
|---|---|
| Kitikmeot Regional Wildlife Board | No response |
| Spence Bay Hunters and Trappers Organization | Do not Support |
| Nunavut Tunngavik Incorporated | No response |
| Gjoa Haven Hunters and Trappers Organization | No response |
| Resolute Bay Hunters and Trappers Organization | No response |
| Qikiqtaaluk Wildlife Board | No response |

Canada

| | |
|---|---|
| Iviq Hunters and Trappers Organization | No response |
| Kitikmeot Regional Wildlife Board | No response |
| Kurtairojuark Hunters and Trappers Organization | No response |
| Ekaluktutiak Hunters and Trappers Organization | No response |

**Request of the NWMB:**

- That the NWMB considers whether or not they approve the listing of Peary Caribou as Threatened under the federal Species at Risk Act.




Peary Caribou - Range

Prepared by: Amy Ganton, Species at Risk Biologist
Canadian Wildlife Service, Yellowknife, NT
Phone: 867-669-4710
Date Drafted: 2017-Nov-03

# Peary Caribou


Photo: © Morgan Anderson – Government of Nunavut

**Scientific name**
*Rangifer tarandus pearyi*

**Taxon**
Mammals

**COSEWIC Status**
Threatened

**Canadian range**
Northwest Territories, Nunavut

## Reason for Designation

This subspecies of caribou is endemic to the Canadian Arctic Archipelago, living on the edge of plant growth in polar desert and arctic tundra environments. The current population is estimated at 13,200 mature individuals. From a population high of 22,000 in 1987, the species experienced a catastrophic die-off in the mid-1990s related to severe icing events in some parts of its range. The population was ca. 5,400 mature individuals in 1996, the lowest since surveys first commenced in 1961. Of four subpopulations, two are currently showing an increasing trend, one is stable, and the fourth had fewer than 10 individuals at the last count in 2005, with no evidence of any recovery. The overall population has experienced an estimated three-generation decline of 35%, but has been increasing over the past two decades. The highest-impact threats derive from a changing climate, including increased intensity and frequency of rain-on-snow events negatively affecting forage accessibility in winter, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns.

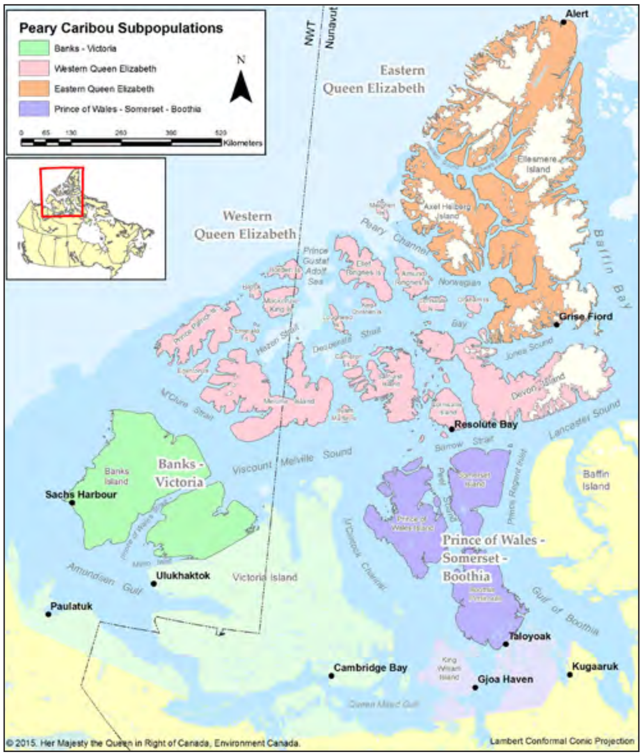
## Wildlife Species Description and Significance

Peary Caribou are the smallest North American caribou. They are mostly white with a slate back and a grey stripe down the front of the legs. In winter, the slate back may turn a dingy brown, and some individuals appear almost entirely white. Antler velvet is slate-coloured instead of brown like deer and other caribou. The antlers tend not to spread as wide as those of other caribou but otherwise they are similar. The skull has a short rostrum and high cranium. The hooves are short and wide. They are genetically distinct from other caribou in Canada.

Peary Caribou are integral components of Inuit and Inuvialuit culture and economy. As the only source of caribou meat for several Arctic communities, they are important in the subsistence economy of local communities, and represented in traditional crafts that are marketed and collected throughout Canada and internationally. Persisting at the limits of plant and animal existence, Peary Caribou are an integral part of Arctic biodiversity and increasingly important in the scientific study of ecosystem response to climate change.

## Distribution

Peary Caribou are endemic to Canada in the Northwest Territories and Nunavut. They have the northernmost distribution of all caribou in North America, situated almost entirely within the Canadian Arctic Archipelago, with the exception of Baffin Island. Peary Caribou move relatively long distances, including annual migrations across sea ice, regular movements within multi-island home ranges and erratic large-scale movements among islands during severe winters. Four subpopulations are recognized, based on genetic evidence, extent of inter-island movements, and scientific and local expertise: 1) Banks-Victoria islands, 2) Prince of Wales-Somerset-Boothia, 3) Eastern Queen Elizabeth Islands, and 4) Western Queen Elizabeth Islands.




Distribution map of Peary Caribou (*Rangifer tarandus pearyi*), showing the subpopulations of Peary Caribou (Johnson et al. in prep.). Light green and light purple shading denotes areas of additional sightings of Peary Caribou outside core range for the Banks-Victoria and Prince of Wales-Somerset-Boothia subpopulations, respectively. Map provided by: Dawn Andrews, Environment Canada.

## Habitat

The habitat of Peary Caribou is treeless Arctic tundra primarily within High and Middle Arctic tundra ecoregions. Most of the range can be characterized as a polar desert with short, cool summers and long, cold winters. The growing season is brief (50-60 days) and variable. Snow cover is generally present from September to May (Banks Island) or mid-late June (Melville Island). Land dominated by dry vegetation covers about 36% of the ice-free area within Peary Caribou range while the terrain ranges from relatively flat (south and west) to mountainous (north and east). The climate is also strongly regionalized with east-west and north-south gradients in precipitation and temperature, affecting primary productivity and forage availability. Above-ground plant biomass ranges from < 100 g/m$^2$ (Queen Elizabeth Islands and parts of the Prince of Wales-Somerset group) to some areas (Banks Island and Prince of Wales Island) having up to 500–2000 g/m$^2$. Peary Caribou have a broad/varied diet and are versatile feeders with diet varying seasonally in relation to available forage and corresponding nutritional content. Essentially all historical Peary Caribou habitat is available and has not been lost or fragmented by industrial or other anthropogenic developments.

Photo: © Morgan Anderson – Government of Nunavut

Peary Caribou in their typical Arctic habitat

## Biology

Peary Caribou have several adaptations to their Arctic environment such as compact body size for conserving heat, hooves that allow them to walk on and dig through wind-driven snow, and pelage that provides camouflage. They are adapted to limited plant growth with a highly compressed growing season and long periods of snow-covered frozen standing vegetation.

Peary Caribou are polygynous, living in small groups and maintaining a wide dispersion across the landscape, even during calving and rutting. They are thought to live approximately 15 years in the wild, and have widely variable vital rates. Cows usually produce their first offspring by 3 years of age; under conditions of high forage availability cows can calve every year but this is rare. Peary Caribou cows cope with occasional years of restricted forage access either by not becoming pregnant, or by weaning a calf prematurely. The intergeneration period (the average age of parents of the current year's cohort) cannot be precisely calculated, but is estimated at 9 years.

## Population Sizes and Trends

Evaluating trends in abundance for Peary Caribou since the first surveys were conducted in the 1960s is made difficult by irregular frequency in surveys (in time and space), as well as changes in survey design and methodology. From 1961 to 2014, government agencies conducted a total of 154 aerial surveys to estimate Peary Caribou abundance throughout the Canadian Arctic. There has been no single year when the entire range has been surveyed.

The current population of Peary Caribou is estimated at about 13,200 mature individuals. In the early 1960s, when the first population counts were made, there were ca. 50,000 Peary Caribou. The population in 1987 was ca. 22,000 mature individuals. It reached its lowest known point in 1996 at ca. 5,400 animals following die-offs related to icing events that affected the Western Queen Elizabeth Islands subpopulation in particular. Numbers have increased since that time, but have not fully recovered. The Prince of Wales-Somerset-Boothia subpopulation, which comprised almost half of the known Peary Caribou population in 1987, began to decline in the 1980s, for reasons that remain ill-understood. Although the last survey was in 2006, there is no evidence for any recovery today. Banks-Victoria numbers have been increasing in the past decade, but not on Victoria Island. The two northern subpopulations (Western and Eastern Queen Elizabeth Islands) have increased overall since the mid-1990s, although baseline levels are not well known. The overall three-generation population (27 years) decline for Peary Caribou is estimated at 35%, while the two-generation trend is positive (ca. 142%).

## Threats and Limiting Factors

The overall calculated and assigned threat impact is Very High-Medium for Peary Caribou. This wide range rank of threat impacts is due to the combined effect of the high number of mostly low-impact threats, and the considerable uncertainty, unpredictability, and potential overlap and interaction of most individual threats.

The highest-impact threat to Peary Caribou arises from the myriad effects of a changing climate, including increased intensity and frequency of severe weather events negatively affecting forage accessibility in the winters, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns. The extent to which such negative effects could be offset by increases in plant productivity is uncertain. Other threats that are known, suspected, or predicted to have negative impacts on reproductive success or survival of Peary Caribou under a warming climate include pathogens (especially *Brucella* and *Erysipelothrix*) and increased shipping. Lower-impact direct threats include hunting, energy production and mining, human intrusions from work (non-tourist) activities, year-round military exercises, increases in traffic from snowmobiles, helicopters, and airplanes, competition with Muskoxen and airborne pollution.

## Protection, Status, and Ranks

COSEWIC most recently assessed this species as Threatened in 2015. Peary Caribou are currently listed under Schedule 1 as Endangered under the federal *Species at Risk Act* (2011) and were listed as Threatened under NWT's *Species at Risk Act* (NWT) in 2013. Peary Caribou are co-managed in Nunavut according to the Nunavut Land Claims Agreement and in NWT according to the Inuvialuit Final Agreement, which confer primary wildlife management authority on the Nunavut Wildlife Management Board and the Wildlife Management Advisory Council, respectively.

Source: COSEWIC. 2015. COSEWIC assessment and status report on the Peary Caribou *Rangifer tarandus pearyi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 92 pp.

For more information, please visit www.sararegistry.gc.ca.

Cat. No.: CW69-14/191-2016-1E-PDF
ISBN: 978-0-660-07328-6

# COSEWIC
# Assessment and Status Report

on the

# Peary Caribou
## *Rangifer tarandus pearyi*

**in Canada**

**THREATENED**
**2015**

**COSEWIC**
Committee on the Status
of Endangered Wildlife
in Canada

**COSEPAC**
Comité sur la situation
des espèces en péril
au Canada

NWMB RM 004-2017 0186

COSEWIC status reports are working documents used in assigning the status of wildlife species suspected of being at risk. This report may be cited as follows:

COSEWIC. 2015. COSEWIC assessment and status report on the Peary Caribou *Rangifer tarandus pearyi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. xii + 92 pp. (http://www.registrelep-sararegistry.gc.ca/default_e.cfm).

Previous report(s):

COSEWIC. 2004. COSEWIC assessment and update status report on the Peary caribou *Rangifer tarandus pearyi* and the barren-ground caribou *Rangifer tarandus groenlandicus* (Dolphin and Union population) in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. x + 91 pp. (www.sararegistry.gc.ca/status/status_e.cfm).

Gunn, A., F.L. Miller and D.C. Thomas. 1979. COSEWIC status report on the Peary caribou *Rangifer tarandus pearyi* in Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 40 pp.

Miller, F.L. 1991. Update COSEWIC status report on the Peary caribou *Rangifer tarandus pearyi* In Canada. Committee on the Status of Endangered Wildlife in Canada. Ottawa. 124 pp.

Production note:
COSEWIC would like to acknowledge Lee Harding (SciWrite Environmental Services) for writing the status report on the Peary Caribou, *Rangifer tarandus pearyi*, in Canada, prepared under contract with Environment Canada. This report was overseen and edited by Justina Ray, Co-chair of the COSEWIC Terrestrial Mammals Specialist Subcommittee.

For additional copies contact:

COSEWIC Secretariat
c/o Canadian Wildlife Service
Environment Canada
Ottawa, ON
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Tel.: 819-938-4125
Fax: 819-938-3984
E-mail: ec.cosepac-cosewic.ec@canada.ca
http://www.cosewic.gc.ca

Également disponible en français sous le titre Évaluation et Rapport de situation du COSEPAC sur le Caribou de Peary (*Rangifer tarandus pearyi*) au Canada.

Cover illustration/photo:
Peary Caribou — Photo (Peary Caribou in Svartfjeld Peninsula, Ellesmere Island, 2015). Photo credit: Morgan Anderson, Government of Nunavut.


Catalogue No. CW69-14/191-2016E-PDF
ISBN 978-0-660-04902-1

# COSEWIC
# Assessment Summary

**Assessment Summary – November 2015**

**Common name**
Peary Caribou

**Scientific name**
*Rangifer tarandus pearyi*

**Status**
Threatened

**Reason for designation**
This subspecies of caribou is endemic to the Canadian Arctic Archipelago, living on the edge of plant growth in polar desert and arctic tundra environments. The current population is estimated at 13,200 mature individuals. From a population high of 22,000 in 1987, the species experienced a catastrophic die-off in the mid-1990s related to severe icing events in some parts of its range. The population was ca. 5,400 mature individuals in 1996, the lowest since surveys first commenced in 1961. Of four subpopulations, two are currently showing an increasing trend, one is stable, and the fourth had fewer than 10 individuals at the last count in 2005, with no evidence of any recovery. The overall population has experienced an estimated three-generation decline of 35%, but has been increasing over the past two decades. The highest-impact threats derive from a changing climate, including increased intensity and frequency of rain-on-snow events negatively affecting forage accessibility in winter, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns.

**Occurrence**
Northwest Territories, Nunavut

**Status history**
The original designation considered a single unit that included Peary Caribou, *Rangifer tarandus pearyi*, and what is now known as the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. It was assigned a status of Threatened in April 1979. Split to allow designation of three separate populations in 1991: Banks Island (Endangered), High Arctic (Endangered) and Low Arctic (Threatened) populations. In May 2004 all three population designations were de-activated, and the Peary Caribou was assessed separately from the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. The subspecies *pearyi* is composed of a portion of the former “Low Arctic population”, and all of the former “High Arctic” and “Banks Island” populations, and it was designated Endangered in May 2004. Status re-examined and designated Threatened in November 2015.

**COSEWIC**
**Executive Summary**

**Peary Caribou**
*Rangifer tarandus pearyi*

## Wildlife Species Description and Significance

Peary Caribou are the smallest North American caribou. They are mostly white with a slate back and a grey stripe down the front of the legs. In winter, the slate back may turn a dingy brown, and some individuals appear almost entirely white. Antler velvet is slate-coloured instead of brown like deer and other caribou. The antlers tend not to spread as wide as those of other caribou but otherwise they are similar. The skull has a short rostrum and high cranium. The hooves are short and wide. They are genetically distinct from other caribou in Canada.

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Peary Caribou are endemic to Canada in the Northwest Territories and Nunavut. They have the northernmost distribution of all caribou in North America, situated almost entirely within the Canadian Arctic Archipelago, with the exception of Baffin Island. Peary Caribou move relatively long distances, including annual migrations across sea ice, regular movements within multi-island home ranges and erratic large-scale movements among islands during severe winters. Four subpopulations are recognized, based on genetic evidence, extent of inter-island movements, and scientific and local expertise: 1) Banks-Victoria islands, 2) Prince of Wales-Somerset-Boothia, 3) Eastern Queen Elizabeth Islands, and 4) Western Queen Elizabeth Islands.

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The habitat of Peary Caribou is treeless Arctic tundra primarily within High and Middle Arctic tundra ecoregions. Most of the range can be characterized as a polar desert with short, cool summers and long, cold winters. The growing season is brief (50-60 days) and variable. Snow cover is generally present from September to May (Banks Island) or mid-late June (Melville Island). Land dominated by dry vegetation covers about 36% of the ice-free area within Peary Caribou range while the terrain ranges from relatively flat (south and west) to mountainous (north and east). The climate is also strongly regionalized with east-west and north-south gradients in precipitation and temperature, affecting primary productivity and forage availability. Above-ground plant biomass ranges from < 100 $g/m^2$ (Queen Elizabeth Islands and parts of the Prince of Wales-Somerset group) to some areas (Banks Island and Prince of Wales Island) having up to 500–2000 $g/m^2$. Peary Caribou have a broad/varied diet and are versatile feeders with diet varying seasonally in relation to available forage and corresponding nutritional content. Essentially all historical Peary Caribou habitat is available and has not been lost or fragmented by industrial or other anthropogenic developments.

## Biology

Peary Caribou have several adaptations to their Arctic environment such as compact body size for conserving heat, hooves that allow them to walk on and dig through wind-driven snow, and pelage that provides camouflage. They are adapted to limited plant growth with a highly compressed growing season and long periods of snow-covered frozen standing vegetation.

Peary Caribou are polygynous, living in small groups and maintaining a wide dispersion across the landscape, even during calving and rutting. They are thought to live approximately 15 years in the wild, and have widely variable vital rates. Cows usually produce their first offspring by 3 years of age; under conditions of high forage availability cows can calve every year but this is rare. Peary Caribou cows cope with occasional years of restricted forage access either by not becoming pregnant, or by weaning a calf prematurely. The intergeneration period (the average age of parents of the current year's cohort) cannot be precisely calculated, but is estimated at 9 years.

## Population Sizes and Trends

Evaluating trends in abundance for Peary Caribou since the first surveys were conducted in the 1960s is made difficult by irregular frequency in surveys (in time and space), as well as changes in survey design and methodology. From 1961 to 2014, government agencies conducted a total of 154 aerial surveys to estimate Peary Caribou abundance throughout the Canadian Arctic. There has been no single year when the entire range has been surveyed.

The current population of Peary Caribou is estimated at about 13,200 mature individuals. In the early 1960s, when the first population counts were made, there were ca. 50,000 Peary Caribou. The population in 1987 was ca. 22,000 mature individuals. It reached its lowest known point in 1996 at ca. 5,400 animals following die-offs related to icing events that affected the Western Queen Elizabeth Islands subpopulation in particular. Numbers have increased since that time, but have not fully recovered. The Prince of Wales-Somerset-Boothia subpopulation, which comprised almost half of the known Peary Caribou population in 1987, began to decline in the 1980s, for reasons that remain ill-understood. Although the last survey was in 2006, there is no evidence for any recovery today. Banks-Victoria numbers have been increasing in the past decade, but not on Victoria Island. The two northern subpopulations (Western and Eastern Queen Elizabeth Islands) have increased overall since the mid-1990s, although baseline levels are not well known. The overall three-generation population (27 years) decline for Peary Caribou is estimated at 35%, while the two-generation trend is positive (ca. 142%).

## Threats and Limiting Factors

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The highest-impact threat to Peary Caribou arises from the myriad effects of a changing climate, including increased intensity and frequency of severe weather events negatively affecting forage accessibility in the winters, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns. The extent to which such negative effects could be offset by increases in plant productivity is uncertain. Other threats that are known, suspected, or predicted to have negative impacts on reproductive success or survival of Peary Caribou under a warming climate include pathogens (especially *Brucella* and *Erysipelothrix*) and increased shipping. Lower-impact direct threats include hunting, energy production and mining, human intrusions from work (non-tourist) activities, year-round military exercises, increases in traffic from snowmobiles, helicopters, and airplanes, competition with Muskoxen and airborne pollution.

## Protection, Status, and Ranks

COSEWIC most recently assessed this species as Threatened in 2015. Peary Caribou are currently listed under Schedule 1 as Endangered under the federal *Species at Risk Act* (2011) and were listed as Threatened under NWT’s *Species at Risk Act* (NWT) in 2013. Peary Caribou are co-managed in Nunavut according to the Nunavut Land Claims Agreement and in NWT according to the Inuvialuit Final Agreement, which confer primary wildlife management authority on the Nunavut Wildlife Management Board and the Wildlife Management Advisory Council, respectively.

# TECHNICAL SUMMARY

*Rangifer tarandus pearyi*

Peary Caribou — Caribou de Peary

Range of occurrence in Canada (province/territory/ocean): Northwest Territories and Nunavut

### Demographic Information

| | |
|---|---|
| Generation time | 9 years |
| Is there an [observed, inferred, or projected] continuing decline in number of mature individuals? | No |
| Estimated percent of continuing decline in total number of mature individuals within 2 generations | Overall increase ca. 142% |
| [Observed, estimated, inferred or suspected] percent [reduction or increase] in total number of mature individuals over the last 3 generations. | Overall decline ca. 35% |
| [Projected or suspected] percent [reduction or increase] in total number of mature individuals over the next 3 generations. | Unknown |
| [Observed, estimated, inferred, or suspected] percent [reduction or increase] in total number of mature individuals over any [3 generations] period, over a time period including both the past and the future. | Unknown |
| Are the causes of the decline clearly reversible and understood and ceased? | No, for the 2 subpopulations in decline |
| Are there extreme fluctuations in number of mature individuals? | No |

### Extent and Occupancy Information

| | |
|---|---|
| Estimated extent of occurrence | 1 914 910 $km^2$ |
| Index of area of occupancy (IAO, 2x2 grid) | 366 384 $km^2$ |
| Is the population severely fragmented? | No |
| Number of locations | Unknown, but > 10 |
| Is there an [observed, inferred, or projected] continuing decline in extent of occurrence? | No |
| Is there an [observed, inferred, or projected] continuing decline in index of area of occupancy?<br><br>*Past area of occupancy decline based on virtual extirpation of Prince of Wales-Somerset-Boothia subpopulation.* | No |
| Is there an [observed, inferred, or projected] continuing decline in number of (sub) populations?<br><br>*Number of subpopulations is stable unless Prince of Wales-Somerset-Boothia subpopulation is confirmed extirpated.* | Possibly |
| Is there an [observed, inferred, or projected] continuing decline in number of locations? | Unknown |

| | |
|---|---|
| Is there an [observed, inferred, or projected] continuing decline in [area, extent and/or quality] of habitat?<br><br>*Sea ice is projected to decline and extreme weather events (projected to increase in frequency and perhaps severity in some places) may lead to decreases in habitat quality. On the other hand, habitat productivity may increase, especially for the two northern subpopulations.* | Possibly |
| Are there extreme fluctuations in number of populations? | No |
| Are there extreme fluctuations in number of locations? | No |
| Are there extreme fluctuations in extent of occurrence? | No |
| Are there extreme fluctuations in index of area of occupancy? | No |

**Number of Mature Individuals (in each subpopulation)**

| | |
|---|---|
| Subpopulations (at time of last survey) | |
| Banks-Victoria | ~2,250 |
| Prince of Wales-Somerset-Boothia | < 10 |
| Eastern Queen Elizabeth Islands | ~3,000 |
| Western Queen Elizabeth Islands | ~8,000 |
| Total (sum of most recent surveys) | ~13,200 |

**Quantitative Analysis**

| | |
|---|---|
| Probability of extinction in the wild is at least [20% within 5 generations (=54 years), or 10% within 100 years]. | N/A |

**Threats (actual or imminent, to populations or habitats)**

| |
|---|
| Was a threat calculator completed for this species: Yes<br><u>Members</u>: Justina Ray (TM SSC Co-chair, moderator), Dave Fraser (BC, moderator), Dan Benoit (ATK SC Co-chair), Suzanne Carrière (NT), Nic Larter (NT)<br><u>External Experts</u>: Tracy Davison (NT), Marsha Branigan (NT), Joanna Wilson (NT), Morgan Anderson (NU), Lisa-Marie LeClerc (NU), Andrew Maher (PCA), Renee Wissink (PCA), Peter Sinkins (PCA), David Lee (NTI), Cheryl Johnson (EC), Agnes Richards (EC), Donna Bigelow (CWS), Dawn Andrews (CWS), Lisa Pirie (CWS), Anne Gunn (Status Report writer for Barren-ground Caribou (DU3)), Karla Letto (NWMB), John Lucas (WMAC), Phillip Manik, Sr. (Resolute Bay HTO), Peter Qayutinuak Sr. (Spence Bay HTA - Taloyoak), Issiac Elanik (Sachs Harbour HTC), Bradley Carpenter (Olohaktomiut HTC - Uluhaktok)<br><br><u>Overall threat impact</u>: Very High-Medium.<br><br><u>High-Medium Impact</u>: Climate change: a) terrestrial habitat changes, sea ice loss, sea level rise and b) severe weather (rain on snow) events (icing).<br><br><u>Medium-Low Impact</u>: Pathogens, shipping lanes<br><br><u>Low impact</u>: hunting, competition (Muskoxen) and predation (Wolves), energy production and mining, human intrusions from work (non-tourist) activities and year-round military exercises, traffic from snowmobiles, helicopters, and airplanes, and airborne pollutants. |

**Rescue Effect (immigration from outside Canada)**

| | |
|---|---|
| Status of outside population(s)? | None |
| Is immigration known or possible? | No |
| Would immigrants be adapted to survive in Canada? | N/A |
| Is there sufficient habitat for immigrants in Canada? | N/A |
| Is rescue from outside populations likely? | N/A |

**Data Sensitive Species**

| | |
|---|---|
| Is this a data sensitive species? | No |

**Status History**

**COSEWIC**: The original designation considered a single unit that included Peary Caribou, *Rangifer tarandus pearyi*, and what is now known as the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. It was assigned a status of Threatened in April 1979. Split to allow designation of three separate populations in 1991: Banks Island (Endangered), High Arctic (Endangered) and Low Arctic (Threatened) populations. In May 2004 all three population designations were de-activated, and the Peary Caribou, *Rangifer tarandus pearyi*, was assessed separately from the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. The subspecies *pearyi* is comprised of a portion of the former "Low Arctic population", and all of the former "High Arctic" and "Banks Island" populations, and it was designated Endangered in May 2004.

Peary Caribou was recognized as one of 12 caribou designatable units in Canada by COSEWIC (2011).

**Status and Reasons for Designation**:

| **Status:**<br>Threatened | **Alpha-numeric code:**<br>A2a |
|---|---|
| **Reasons for designation:**<br>This subspecies of caribou is endemic to the Canadian Arctic Archipelago, living on the edge of plant growth in polar desert and arctic tundra environments. The current population is estimated at 13,200 mature individuals. From a population high of 22,000 in 1987, the species experienced a catastrophic die-off in the mid-1990s related to severe icing events in some parts of its range. The population was ca. 5,400 mature individuals in 1996, the lowest since surveys first commenced in 1961. Of four subpopulations, two are currently showing an increasing trend, one is stable, and the fourth had fewer than 10 individuals at the last count in 2005, with no evidence of any recovery. The overall population has experienced an estimated three-generation decline of 35%, but has been increasing over the past two decades. The highest-impact threats derive from a changing climate, including increased intensity and frequency of rain-on-snow events negatively affecting forage accessibility in winter, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns. | |

**Applicability of Criteria**

| |
|---|
| Criterion A (Decline in Total Number of Mature Individuals):<br>Meets Threatened, A2a, because the decline over the past three generations (27 years) based on periodic aerial surveys is estimated to exceed 30%. |
| Criterion B (Small Distribution Range and Decline or Fluctuation):<br>Does not meet criteria. Both the EOO and IAO exceed the thresholds for this criterion. |
| Criterion C (Small and Declining Number of Mature Individuals):<br>Does not meet criteria. Total number of mature individuals exceeds 10,000 mature individuals. |

| |
|---|
| Criterion D (Very Small or Restricted Population):<br>Does not meet criteria. The total number of mature individuals exceeds 1,000 and the number of locations is certainly more than the threshold. |
| Criterion E (Quantitative Analysis):<br>Not applicable. |

## PREFACE

This report incorporates information that became available after the last COSEWIC Status Update (COSEWIC 2004) for Peary Caribou *Rangifer tarandus pearyi*. In 1991, prior to the enactment of the *Species at Risk Act* (SARA), caribou throughout the Canadian Arctic Archipelago except for Baffin Island were considered to be Peary Caribou (Miller 1991). In 2004, COSEWIC assessed two entities: 1) Peary Caribou, which included all caribou in the Arctic Archipelago except for Baffin Island and central and southern Victoria Island and 2) Dolphin and Union Caribou, a genetically distinct population that occupies the remainder of Victoria Island, and migrates to the mainland in winter across the Dolphin and Union Strait. COSEWIC undertook an analysis of designatable unit (DU) structure of caribou in Canada as a special project (COSEWIC 2011) to define the units for future status assessments and reassessments of this species according to the latest guidelines. Recognition of Peary Caribou and Dolphin and Union Caribou as two of 12 DUs in Canada was affirmed by this special project.

Unlike COSEWIC (2004), this report considers Peary Caribou only. Since the last assessment, surveys have been conducted in all four Peary Caribou subpopulation ranges to provide updated information on abundance and trends. The most important of these took place in the eastern High Arctic where populations had not been surveyed since 1961. Other aerial surveys clarified trends or updated trends. Recent genetic analyses (McFarlane *et al*. 2014) based on nuclear (microsatellite) DNA has confirmed the genetic distinctiveness of Peary Caribou from other caribou, particularly their isolation and divergence from Barren-ground Caribou in the relatively recent past (end of Pleistocene/early Holocene).

Other significant contributions to this update include: 1) an assessment of the conservation status of Peary Caribou (SARC 2012), including Aboriginal Traditional Knowledge, undertaken by the Government of Northwest Territories; and 2) updates from traditional ecological knowledge on caribou collected and summarized from Aboriginal sources by the COSEWIC Aboriginal Traditional Knowledge (ATK) Subcommittee.

In 2011, Peary Caribou was listed under SARA as Endangered, following the results of the last COSEWIC assessment in 2004. Environment Canada is in the process of developing a recovery strategy for Peary Caribou (Environment Canada, in prep.). This report has benefited from ATK (including Inuit Qaujimajatuqangit [IQ; Inuit traditional knowledge]), compilation of population data, various maps, and additional scientific information gathered through this process.

## COSEWIC HISTORY

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) was created in 1977 as a result of a recommendation at the Federal-Provincial Wildlife Conference held in 1976. It arose from the need for a single, official, scientifically sound, national listing of wildlife species at risk. In 1978, COSEWIC designated its first species and produced its first list of Canadian species at risk. Species designated at meetings of the full committee are added to the list. On June 5, 2003, the *Species at Risk Act* (SARA) was proclaimed. SARA establishes COSEWIC as an advisory body ensuring that species will continue to be assessed under a rigorous and independent scientific process.

## COSEWIC MANDATE

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) assesses the national status of wild species, subspecies, varieties, or other designatable units that are considered to be at risk in Canada. Designations are made on native species for the following taxonomic groups: mammals, birds, reptiles, amphibians, fishes, arthropods, molluscs, vascular plants, mosses, and lichens.

## COSEWIC MEMBERSHIP

COSEWIC comprises members from each provincial and territorial government wildlife agency, four federal entities (Canadian Wildlife Service, Parks Canada Agency, Department of Fisheries and Oceans, and the Federal Biodiversity Information Partnership, chaired by the Canadian Museum of Nature), three non-government science members and the co-chairs of the species specialist subcommittees and the Aboriginal Traditional Knowledge subcommittee. The Committee meets to consider status reports on candidate species.

## DEFINITIONS
**(2015)**

| | |
|---|---|
| Wildlife Species | A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and is either native to Canada or has extended its range into Canada without human intervention and has been present in Canada for at least 50 years. |
| Extinct (X) | A wildlife species that no longer exists. |
| Extirpated (XT) | A wildlife species no longer existing in the wild in Canada, but occurring elsewhere. |
| Endangered (E) | A wildlife species facing imminent extirpation or extinction. |
| Threatened (T) | A wildlife species likely to become endangered if limiting factors are not reversed. |
| Special Concern (SC)* | A wildlife species that may become a threatened or an endangered species because of a combination of biological characteristics and identified threats. |
| Not at Risk (NAR)** | A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances. |
| Data Deficient (DD)*** | A category that applies when the available information is insufficient (a) to resolve a species' eligibility for assessment or (b) to permit an assessment of the species' risk of extinction. |

* Formerly described as "Vulnerable" from 1990 to 1999, or "Rare" prior to 1990.

** Formerly described as "Not In Any Category", or "No Designation Required."

*** Formerly described as "Indeterminate" from 1994 to 1999 or "ISIBD" (insufficient scientific information on which to base a designation) prior to 1994. Definition of the (DD) category revised in 2006.

Environment Canada / Environnement Canada
Canadian Wildlife Service / Service canadien de la faune

Canada

The Canadian Wildlife Service, Environment Canada, provides full administrative and financial support to the COSEWIC Secretariat.

# COSEWIC Status Report

on the

# Peary Caribou
*Rangifer tarandus pearyi*

**in Canada**

2015

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## WILDLIFE SPECIES DESCRIPTION AND SIGNIFICANCE

### Name and Classification

Class: Mammalia; Order: Artiodactyla; Family: Cervidae; Subfamily: Capreolinae

Scientific name: *Rangifer tarandus pearyi* Allen, 1902.

Common names: Peary Caribou (English), Caribou de Peary (French), Tuktu (Plural: Tuktuk; Inuvialuktun), Tuktuinak (Inuinnaqtun), Tuktuaraaluit (Siglitun), Tuttunguluurat (Ummarmiutun).

The Peary Caribou (see cover), is a subspecies of caribou (*Rangifer tarandus*) that is primarily restricted to the Arctic Archipelago of Canada. It was first described by Allen (1902) as *Rangifer pearyi,* but Flerov (1952) later reduced it to subspecies rank. This designation was retained by Banfield (1961), who conducted the last formal taxonomic revision of *Rangifer*, relying on the account of Manning (1960) for Peary Caribou that was based on an examination of 60 skulls, hides and leg bones.

### Morphological Description

In comparison with other caribou DUs in Canada, Peary Caribou have a whiter to greyer pelage in all seasons. They have smaller bodies with shorter legs and faces, blunter and wider hooves, and grey antler velvet (Manning 1960, Geist 1998; Ekaluktutiak HTA 2013; Gjoa Haven HTA 2013; Spence Bay HTO 2013). The pelage is long, silky and creamy-white in early winter, becoming shaggy and brown-tinged on the back by spring when dark brown eye and neck patches appear as a result of shedding. The summer coat is slate grey above, sometimes lacking a pronounced flank stripe, and white below; legs are white except for a narrow frontal stripe (see **Designatable Units**).

Peary Caribou was formally described in 1902 from skulls and skins collected on Ellesmere Island and nearby islands (Allen 1902, 1908). The skull has a short pointed rostrum but the molar tooth row is proportionally long (Banfield 1961; Manning and Macpherson 1961). Manning (1960) described a cline in skull size and proportions with increasing size from the southern islands (Banks, Prince of Wales) to the northern Queen Elizabeth Islands (QEI). Within the latter, size tends to increase from east to west and from north to south (Manning 1960; Thomas and Everson 1982). Inuit of Resolute Bay reported that the features that are unique to Peary Caribou become more pronounced on the islands north of Bathurst Island Complex (Taylor 2005).

Thomas and Everson (1982) worked with Inuit hunters to collect caribou measurements across the western QEI (WQEI) and Prince of Wales, Somerset and Boothia Peninsula and samples were later used for DNA analyses (McFarlane *et al*. 2009; 2014). The body measurements supported the cline in skull size noted by Manning (1960). Mean body length ranged from 146.1 ± SE 1.3 cm (n=27) for females from Prince Patrick Island, the western-most large island in the QEI, to 152.9 ± SE 1.1

cm (n=25) for Prince of Wales Island females (Thomas and Everson 1982; the series did not include animals from the eastern Queen Elizabeth Islands [EQEI], or Banks, or northwest Victoria islands). Unusually large-bodied caribou that were otherwise similar to Peary Caribou were collected on Prince of Wales Island in August 1958 and 1978 (Manning and Macpherson 1961; Thomas and Everson 1982), termed "ultra *pearyi*" (Manning and Macpherson 1961) or "super *pearyi"* (Banfield 1961). The measurements of those seven 1958 bulls were similar to five exceptionally large-bodied bulls collected on Prince of Wales Island (Thomas and Everson 1982).

## Population Spatial Structure and Variability

### Genetic Structure

North American caribou have been divided into two lineages using genetic analysis of mitochondrial DNA (mtDNA) sequences. The Beringian-Eurasian and the North American Lineages were each named for their ancestral sources in presumed Pleistocene refugia (COSEWIC, 2011; Klütsch *et al*. 2012; Yannic *et al*. 2014). Barren-ground, Peary, and Dolphin and Union Caribou are part of the Beringian-Eurasian Lineage. After the last ice age, as populations expanded and colonized (or re-colonized) northern lands, hybridization resulted in introgression of haplotypes from each group into the other at a low enough frequency to leave each lineage distinct and clearly separable (Klütsch *et al.* 2012). Eger *et al.* (2009) suggested that mtDNA analyses supported two refugia during the last ice age: Banks Island and High Arctic. The High-Arctic refugium was represented by caribou from Bathurst Island, which was isolated from other Peary Caribou. Within the Beringian-Eurasian Lineage, mtDNA patterns have not distinguished among subspecies (Eger *et al.* 2009).

Genetic analysis based on nuclear (microsatellite) DNA, on the other hand, supports the contention that Peary Caribou are genetically distinct from other caribou DUs, including the Dolphin and Union and Barren-ground DUs (COSEWIC 2011; McFarlane *et al.* 2014). Serrouya *et al.* (2012) used Peary Caribou from Bathurst Island (n=20) and Dolphin-Union Caribou (n=43), and two Barren-ground Caribou herds as outgroups in their examination of mountain caribou. They observed that Peary formed a distinct clade with significant differentiation ($F_{ST}$= 0.07) from their nearest neighbour (Dolphin and Union). McFarlane *et al*. (2009) analysed nuclear DNA for specimens from Melville, Banks, NW Victoria, Bathurst, and Prince of Wales islands. McFarlane *et al.* (2014) also included the earliest available specimens of Peary Caribou (1914-1958) as well as the contemporary samples to examine, in particular, the relationship of the 'ultra-*pearyi*' collected from Prince of Wales Island in 1958. The 'ultra-*pearyi*' bulls were not genetically distinct from other Peary Caribou, suggesting that they were not an intergraded form between Barren-ground and Peary Caribou, and that their large body size was most likely due to environmental conditions.

The overall allele frequencies significantly differed among the sample locations supporting subpopulation structure. The lowest diversity (heterozygosity and allele diversity) was from caribou inhabiting Melville Island, Bathurst Island complex, and Prince of Wales–Somerset islands, including the 1958 Prince of Wales samples. Variability was less than those from Banks Island and Boothia Peninsula, or Dolphin and Union and Barren-ground Caribou (McFarlane *et al*. 2009; 2014). The lower genetic diversity likely reflects periodic reductions in abundance, although the historical and contemporary samples were not distinct from each other. Peary Caribou from northern Ellesmere also had low variability, often an indication of a past genetic bottleneck (Petersen *et al.* 2010).

<u>Subpopulation Structure</u>

The wide distribution of Peary Caribou across multiple islands and habitats has led to various iterations of units being proposed for management purposes. COSEWIC (Miller 1991) gave separate status designations for four island groups within Peary Caribou, while COSEWIC (2004) separated Peary from Dolphin and Union for status designation purposes, while recognizing the same subpopulation structure within Peary Caribou. This structure has not been completely supported by subsequent genetic analyses. Early work identified significant genetic differentiation among samples from various islands (McFarlane *et al.* 2009), but wider sampling and the use of Bayesian analysis that does not rely on sampling location to cluster animals supported two clusters: 1) Prince of Wales, Somerset, and QEI and 2) Boothia Peninsula, Dolphin and Union and Barren-ground Caribou. Specimens from Banks and northwest Victoria islands did not strongly assign to either cluster. However, pair-wise comparisons revealed significant differences between sample localities (McFarlane *et al*. 2014). The analyses also revealed a genetic basis to the latitudinal cline in morphological measurements.

An examination of scientific and community information derived from the SARA recovery planning process (Johnson *et al.*, in prep.) used three lines of evidence to define four Peary Caribou subpopulations: 1) genetic analyses; 2) extent of inter-island movements, based on local knowledge and limited telemetry data; and 3) scientific and local expert input. The spatial structure used in this report refers to subpopulations inhabiting islands or island complexes that have defined locations of surveys and life history information (Table 1).

<u>Banks-Victoria</u>

There likely is restricted gene flow between caribou on Banks and Victoria islands and the rest of the range of Peary Caribou. Zittlau *et al.* (2009) found that samples from Banks Island and Minto Inlet (northwest Victoria Island) were not significantly different and cross-assigned a high proportion of the time (58% and 33%, respectively). These samples had low assignment to other samples suggesting some degree of isolation (Zittlau *et al.* 2009).

**Table 1. Island groups and their associated islands included for each subpopulation of Peary Caribou (modified from Johnson *et al.*, in prep.). See Figure 1 for corresponding map.**

| Subpopulation | Island Group | Islands |
|---|---|---|
| Banks-Victoria | Banks and Victoria islands | Banks and Victoria islands |
| Prince of Wales-Somerset-Boothia | Prince of Wales-Somerset islands, Boothia Peninsula | Prince of Wales, Somerset, Russell, King William, Pandora, Prescott, Vivian, and Lock islands, Boothia Peninsula |
| Western Queen Elizabeth Islands | Bathurst Island Group | Bathurst Island complex (Cameron, Ile Vanier, Marc, Massey, Alexander, Bathurst islands), Cornwallis, Little Cornwallis, and Helena islands |
| | Melville Island Group | Melville, Prince Patrick, Eglinton, Emerald, and Byam Martin islands |
| | Devon Island Group | Devon, Baillie Hamilton, Coburg, Dundas/Margaret, and North Kent islands |
| | Prime Minister Island Group | Mackenzie King, Brock, and Borden islands |
| | Ringnes Island Group | Ellef Ringnes, Amund Ringnes, Cornwall, King Christian, Meighen, and Lougheed islands |
| Eastern Queen Elizabeth Islands | Ellesmere Island | Ellesmere, Graham, and Buckingham islands |
| | Axel Heiberg Island | Axel Heiberg, Stor, and Hevod islands |

Scientific evidence and Inuvialuit ATK agree that before about 1980 when abundance was still relatively high, Peary Caribou made seasonal movements between Banks and northwestern Victoria islands, and so caribou residing on these two islands were recognized as a subpopulation by COSEWIC (2004). Notably, several aerial surveys since 1982 along with more recent satellite-tracking have failed to detect evidence of such travel, and Inuit hunters reported no evidence of movement in the past decade (Paulatuk HTC 2013).

Movements of satellite-collared cows during 1987–1989 (Gunn and Fournier 2000) and 1996–2006 (Poole *et al*. 2010; ENR unpubl. data 2011, cited in SARC 2012) showed a spatial and temporal separation of the northwestern Victoria Island subpopulation of Peary Caribou from Dolphin and Union Caribou. Although telemetry studies indicated that Peary Caribou cows have been mainly limited to the area north and west of a line between Minto Inlet and Wynniatt Bay, Inuvialuit ATK reveals that they can (albeit rarely) occur south to Admiralty Inlet and east to the Kagloryuak River (ATK in Poole *et al*. 2010; SARC 2012; Figure 1). Inuvialuit from Ulukhaktok and Inuit from Cambridge Bay recognize two kinds of caribou on Victoria Island that are different in size, colour and taste: those in the northwest (Peary Caribou) and others that summer on the central, southern and eastern parts (Dolphin and Union Caribou; Elias 1993; Gunn *et al*. 2011). Inuit from Victoria Island recalled both migratory and non-migratory caribou on Victoria Island before the 1920s (Manning, 1960; SARC 2013).

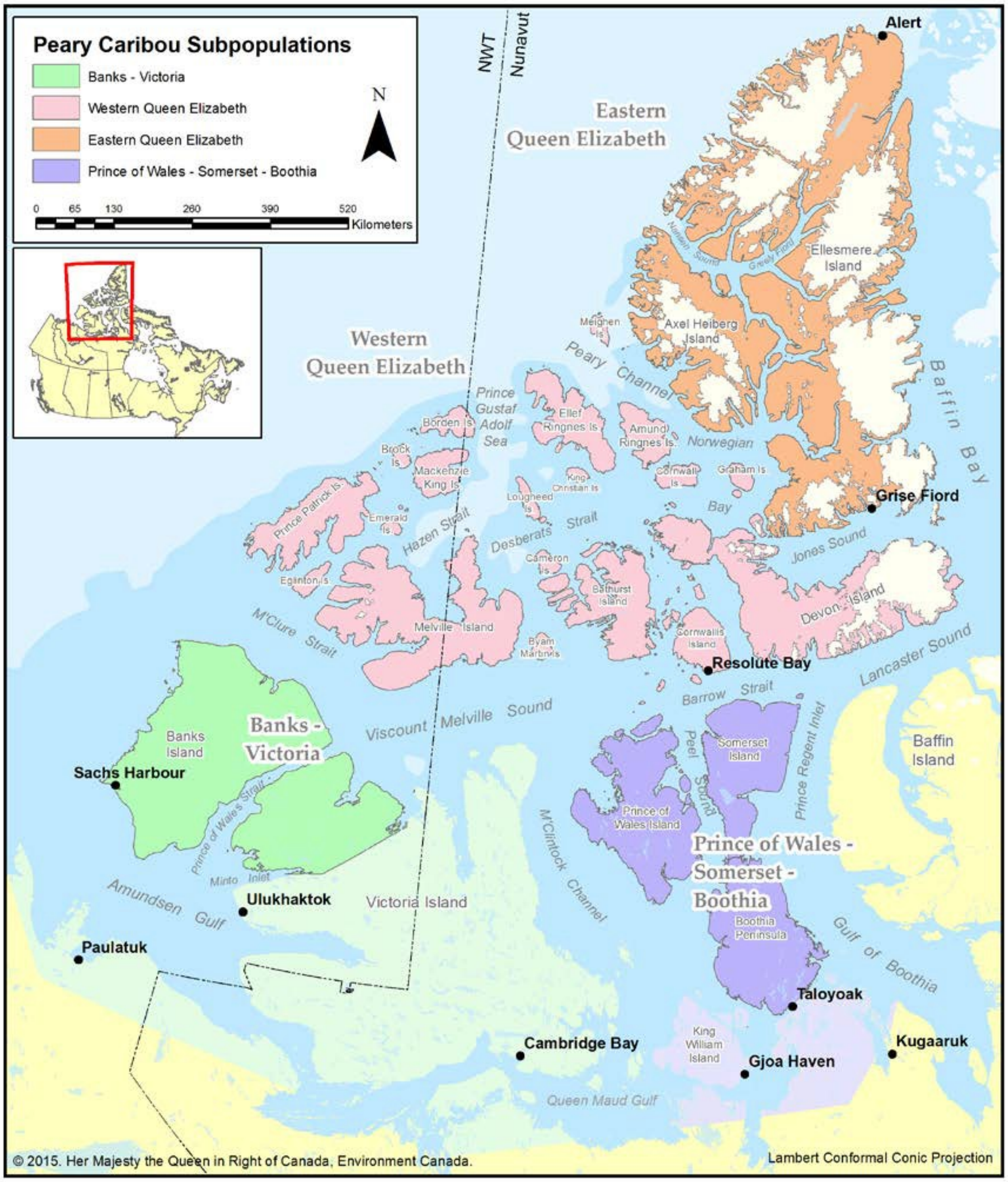



Figure 1. Subpopulations of Peary Caribou (Johnson *et al.* in prep.; see Subpopulation Structure; Table 1). Light green and light purple shading denotes areas of additional sightings of Peary Caribou outside core range for the Banks-Victoria and Prince of Wales-Somerset-Boothia subpopulations, respectively. Map prepared by Dawn Andrews (Environment Canada).

Prince of Wales-Somerset-Boothia

Movement data and community observations suggest that the island complex of Prince of Wales and Somerset islands served as an inter-island subpopulation with many caribou at one time migrating seasonally between islands and Boothia Peninsula (Johnson *et al.* in prep.). For example, large-scale (involving hundreds of caribou) east–west movements occurred between winter ranges on Somerset Island and calving and summer areas on Prince of Wales and Russell islands, as well as their satellite islands such as Pandora, Prescott, Vivian and Lock. Not all individuals undertook these movements, and use of the various islands varied among years (Miller 1990; 1991; 1995; 1997a; Miller *et al.* 2005a; 2007a, b). Boothia Peninsula was also part of winter range, and there were also calving areas identified on Somerset Island, and documentation of spring migration from southeast (Boothia/Somerset islands) to northwest (Prince of Wales/Somerset islands), returning across frozen Peel Sound in the fall (Gunn and Decker 1984, Gunn and Dragon 1998, Miller *et al.* 2005a; Gjoa Haven HTA 2013; Spence Bay HTO, 2013). Some movements of very few caribou were north-south between Prince of Wales Island and the nearby Mecham, Russell, Hamilton, Young and Lowther islands in Barrow Strait, inferred by tracks on sea ice and by changing densities of caribou on the smaller islands. After extensive searching by helicopter for caribou or caribou tracks crossing Barrow Strait to Bathurst, Cornwallis, or Little Cornwallis islands during 1977-1980, Miller (1990) concluded that no regular, large-scale movements occurred between the Prince of Wales-Somerset group and the QEI, although infrequent crossings may be made and have been noted by hunters in Resolute Bay (CWS 2015).

Skull and body measurements (Thomas and Everson 1982) and observations (Gunn and Decker 1984; Miller *et al.* 2007b) have confirmed both Peary and Barren-ground Caribou have occurred on the Boothia Peninsula. Satellite-tracking of five cows in 1991-92 demonstrated that both Peary and Barren-ground Caribou calved on west and east sides of northern Boothia Peninsula, respectively, but did not maintain spatial separation during the rut (breeding season; Gunn *et al.* 2000a), suggesting some possibility of infrequent interbreeding.

The status of caribou subspecies and numbers on King William Island and other islands near the Boothia Peninsula is uncertain. Historical accounts of caribou on King William Island refer to seasonal migration from Adelaide Peninsula by Barren-ground Caribou (summarized in Appendix G, Gunn *et al.* 2000a). Hunters in Gjoa Haven reported that some caribou came from Prince of Wales Island to King William Island in the early or mid-1970s (J. Keanik pers. comm. cited in Gunn and Dragon 1998). Miller (1991) cited Gunn's personal communication of 1989 that reported only a handful of "Peary-like" caribou there in 1989, and that Inuit hunters recognized both Peary-like and Barren-ground Caribou. Groves and Mallek (2011) recorded 204±115 adult caribou on King William Island in 2009 as part of migratory bird surveys, but did not distinguish further. In this assessment, they are included as members of the Prince of Wales-Somerset-Boothia subpopulation for the purposes of the extent of occurrence calculation, but are not included in the subpopulation estimates.

Western Queen Elizabeth Islands

The WQEI comprise five island complexes within which several smaller island groups are identified and caribou exhibit regular, inter-island seasonal movements (Table 1): the Bathurst Island Group, Melville Island Group, Devon Island Group, Prime Minister Island Group, and the Ringnes Island Group. This division of WQEI and EQEI has been modified from Miller *et al.* (2005b), following recent information regarding inter-island movements from community meetings and expert opinion (Figure 2; Johnson *et al.*, in prep.).

Macpherson (1961) first hypothesized large-scale movements within the Prime Minister Group, based on his and Stefansson's (1921) observations of fluctuating caribou numbers. Tener (1963) confirmed inter-island movements after seeing caribou tracks crossing from Mackenzie King Island to Borden Island. Many caribou in the Melville-Prince Patrick complex winter on Prince Patrick Island and move in spring to Eglinton, Emerald, Melville and Byam Martin islands for the summer (Miller *et al.* 1977a). Seasonal inter-island movements are also known within the Bathurst Island complex based on observations and collared caribou (Miller 1990; 1995a; 2002; Poole *et al.* 2015). These patterns are supported by community information (Figure 2; Johnson *et al.* in prep.).

Eastern Queen Elizabeth Islands

Miller *et al.* (2005b) considered the EQEI to have 14 islands that are each > 130 $km^2$, including Ellesmere, Axel Heiberg, and those within the Ringnes and Devon Island groups. Johnson *et al*. (in prep.) modified this division to include Axel Heiberg (including Stor and Hevod Islands) and Ellesmere Islands only, following further technical and community information, assigning the remainder to WQEI. About 95 500 $km^2$ or 39% of the land area of Ellesmere and Axel Heiberg islands is covered with ice caps and permanent snow fields. Inter-island movements likely occur, but have received little documentation. ATK has reported winter migration across sea ice from southern Ellesmere to Smith and Cone islands (Taylor 2005).

Some habitat differences serve as an additional basis for the division between EQEI and WQEI. Specifically, there are some differences between the geomorphology, vegetation patterns, and climate, sharing a common classification as part of the Arctic Cordillera Ecozone (associated with ice caps) and Ellesmere Mountains Ecoregion within the Northern Arctic Ecozone (Ecological Stratification Working Group 1996). The evidence base to support delineation of this as a subpopulation was less than that of the other three demographic units (Johnson *et al.*, in prep.).

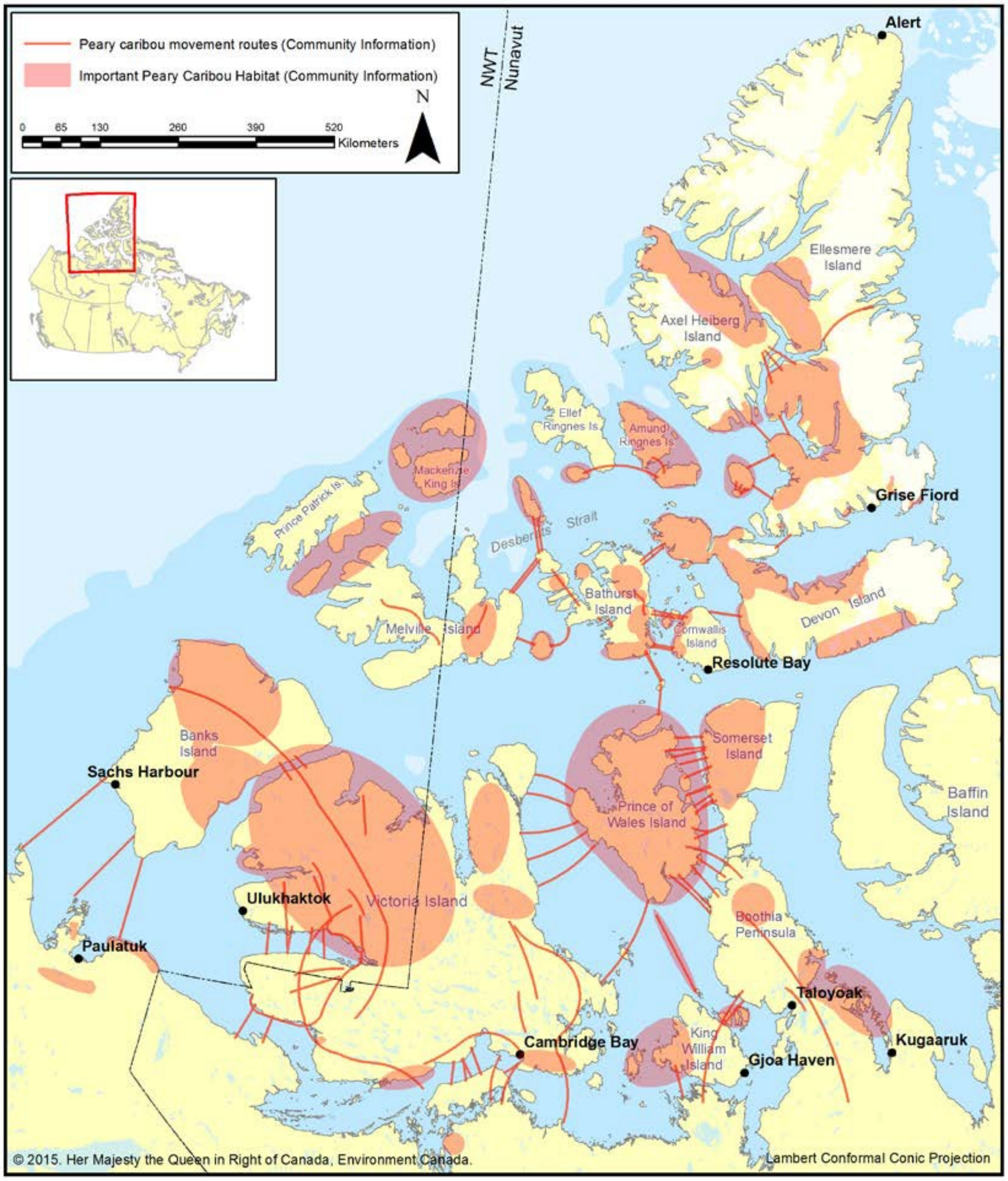



Figure 2. Community information on location of important habitat and movement routes for Peary Caribou. Map prepared by Dawn Andrews (Environment Canada; Johnson *et al.*, in prep.).

## Designatable Units

COSEWIC (2011) recognized the subspecies of Peary Caribou with all of its subpopulations as one of 11 extant caribou DUs. Measures of genetic divergence among Peary and Barren-ground Caribou on the mainland, and also between Peary Caribou and the Dolphin and Union Caribou, support the discrete nature of Peary Caribou regardless of occasional overlap in annual distribution. New genetic information since the DU report was published reaffirms the unique nature of Peary Caribou (McFarlane *et al.*, 2014). Morphological specializations reflect adaptations for Arctic environments (e.g., shorter face and legs) (Banfield 1961). Unique behaviours include the use of several islands as part of their home range by some subpopulations (see **Population Spatial Structure and Variability**), and not forming large post-calving aggregations, in contrast to Barren-ground Caribou (Festa-Bianchet *et al*. 2011).

## Special Significance

Peoples of the Canadian Arctic have hunted caribou for > 4,000 years (Manseau *et al*. 2004). Peary Caribou are important in the subsistence economy of communities where they occur and are integral to the cultures of Inuit and Inuvialuit. They are the only source of caribou meat for several arctic communities. They are frequently represented in the art of Inuit and Inuvialuit and their shed antlers are carved to produce traditional crafts. Persisting at the limits of plant and animal existence, Peary Caribou are an integral part of Arctic ecology and biodiversity. They can be an important prey for Wolves (*Canis lupus*) and are increasingly important in the scientific study of ecosystem response to climate change. Peary Caribou are an important symbol of the Canadian Arctic islands.

# DISTRIBUTION

## Global Range

Peary Caribou range is entirely within Canada, with the possible exception of animals on Greenland. Anderson (1946) suggested that caribou from northwestern Greenland north of Kane Basin may be Peary Caribou, and Banfield (1961) agreed. Miller (1991), citing Meldgaard (1986) who summarized reports of Greenland Inuit, confirmed that small caribou, possibly migrants from Canada, were regularly seen and taken by hunters there. The Inuit reported that normally up to 10 (but occasionally > 100 individuals) were taken annually and that caribou tracks were often seen crossing from Ellesmere Island to Greenland. Roby *et al.* (1984) surveyed the Inglefield Bay-Kane Basin area and did not see any live caribou, but found a caribou mandible in northwest Greenland (Renssalaer Bay, north of Cape Inglefield and on the southern edge of Kane Basin) that was 178 mm long, "…outside the range of [i.e., smaller than] Canadian Barren-ground Caribou... the mandible probably belonged to a specimen of Peary Caribou." They also reviewed the history of caribou declines from this area as a result of severe weather and excessive hunting. It seems probable, therefore, that the Kane

Basin caribou were *R. t. pearyi*, but are now extirpated from Greenland, although a few may rarely cross from Ellesmere Island (Taylor 2005).

### Canadian Range

Peary Caribou have the northernmost distribution of all caribou in North America (Figure 1; Festa-Bianchet *et al.*, 2011). They are found across the Arctic Archipelago except for Baffin Island (which is occupied by Barren-ground Caribou). Peary Caribou also occur on northwestern Victoria Island with some evidence of movements to other parts of that island. A small number occur (or occurred) on Boothia Peninsula and possibly on King William Island (see **Subpopulation Structure**). Peary Caribou disperse across sea ice, either occasionally or as part of seasonal movements, and may be found on any island, although not all of the small islands have year-round inhabitants.

Because population surveys are usually conducted in spring and summer due to day length, winter distribution is less well documented. However, recent information collected in the context of recovery planning led by Environment Canada has indicated a broader-scale distribution than reported in COSEWIC (2004). Cambridge Bay members reported that Peary Caribou have been observed year-round all over Victoria Island, albeit in small numbers (Ekaluktutiak HTA 2013). They have been occasionally spotted on the mainland in two main areas: Pearce Point and Parry Peninsula (Paulatuk HTC 2013). They have been seen near Cambridge Bay, and on the mainland near Kugluktuk (Ekaluktutiak HTA 2013). There were reports (Banfield 1961; Manning and Macpherson 1958; Youngman 1975) of Peary Caribou as far west on the mainland as Old Crow (Yukon), Herschel Island (Yukon), Baillie Island (Northwest Territories), and Cape Dalhousie (Northwest Territories) in the early 1950s, which were linked with years with icing on Banks Island.

### Extent of Occurrence and Area of Occupancy

The extent of occurrence for Peary Caribou is 1,914,910 km$^2$ based on the minimum convex polygon within Canada's extent of jurisdiction as shown in Figure 3 (map and area calculations by D. Andrews, Environment Canada). The index of area occupancy (based on 2 km x 2 km grid cells) as defined by survey observation data only (Johnson *et al.* in prep.) is 91,465 cells or 366,384 km$^2$ (D. Andrews, Environment Canada, in litt.).

The extent of occurrence polygon encloses all caribou observations, based on the most recent survey for each island (Appendix 1) combined with community information (see **Population Status and Trends**).

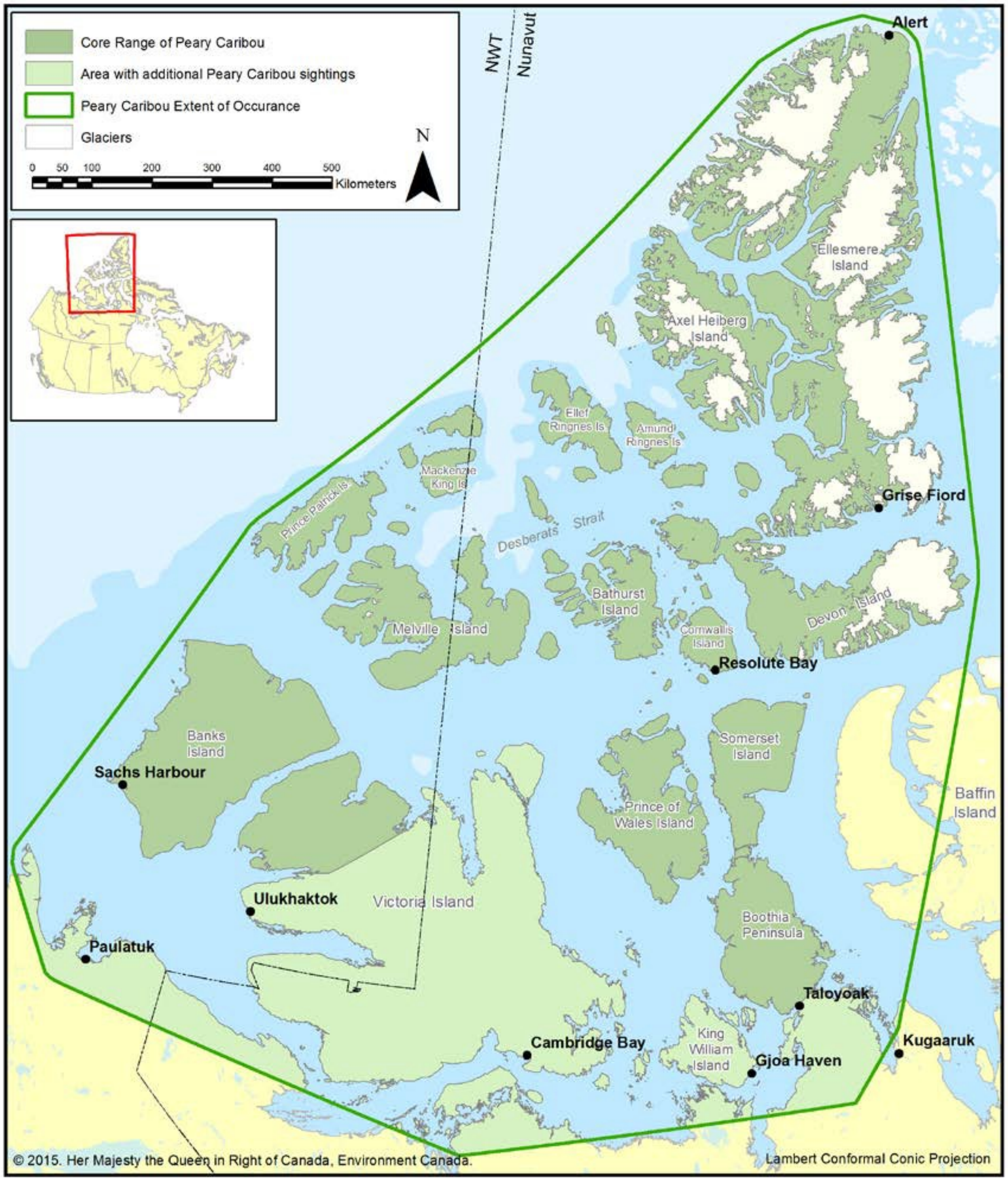



Figure 3. Peary Caribou distribution (with extent of occurrence polygon) based on most recent surveys and community information. Map prepared by Dawn Andrews (Environment Canada).

Banks-Victoria

Banks Island is the westernmost island of the Canadian Arctic Archipelago and covers an area of ca. 71,000 $km^2$. Historical records indicate that Peary Caribou occupy virtually all of the island, at least seasonally (Nagy *et al*. 1996). Based on summer survey distribution during the 1980s, Peary Caribou were most numerous in the northwest and the eastern side of the island with some caribou in the southern end (Nagy *et al.* 1996, Figure 4.). During the 1990s, caribou numbers were at their lowest. The summer 1998 survey showed that caribou were most numerous in the northwest and along the west coast; no caribou were found at the southern end and few on the eastern side (Nagy *et al*. 2013a). Caribou numbers have increased since the 1990s with the most recent survey showing a more widespread distribution on the island, although most occurrences remain concentrated in the northwest (Davison *et al.*, 2014).

Peary Caribou occupy an approximate 36,000 $km^2$ area of northwestern Victoria Island to the north of Minto Inlet (Nagy *et al*. 2009b). Although Peary Caribou numbers have fluctuated, they have always occupied the northwestern area of the island which, based upon satellite telemetry, remains separated from the area inhabited by Dolphin and Union caribou (Davison and Williams 2013).

Prince of Wales-Somerset-Boothia

Prince of Wales and Somerset islands cover more than 58,000 $km^2$ in area and, based on historical records (Gunn and Decker 1984; Miller and Kiliaan 1981; Gunn and Dragon 1998), were virtually all occupied, at least seasonally, when populations were high in the 1960s and 1970s. Annual migrations within this subpopulation are well documented by communities (Gjoa Haven HTA 2013; Resolute HTO 2013; Sachs Harbour HTC 2013; Spence Bay HTO 2013). For example, during 1977–1980, caribou trails across the sea ice effectively joined these two main islands, several satellite islands and the northern part of the Boothia Peninsula (see below) for most of each year, making this complex essentially a single range of >93,000 $km^2$ (Miller *et al*. 2005b).

After caribou essentially vanished by the 1940s (summarized in Gunn and Ashevak 1990), Boothia Peninsula was re-occupied by caribou based on data from the first aerial survey in 1973 (Fischer and Duncan 1976) through the 1980s. Although both Peary and Barren-ground Caribou occurred there, the proportion of each was not quantified during the aerial surveys. Most Peary Caribou were resident on the Boothia Peninsula north of Taloyoak, but some seasonally migrated from Somerset Island or Prince of Wales Island in the fall and back in the spring (Gunn and Ashevak 1990). Caribou in this subpopulation have declined again to very low numbers (see **Fluctuations and Trends**).

Western Queen Elizabeth Islands

The WQEI cover an area of about 180,000 $km^2$; the largest islands are Melville (42,776 $km^2$) and Devon (38,764 $km^2$), followed by Prince Patrick (16,316 $km^2$) and Bathurst Island (16,042 $km^2$). Much of the land area (with the exception of Devon Island) lies below 300 m elevation (Miller *et al*. 2005a), and most is usable habitat, not covered by glaciers. The sporadic nature of surveys and little-documented ATK restrict known distribution patterns mostly to the summer There is some evidence that smaller islands tend not to be used by Peary Caribou during times of reduced abundance (Miller *et al*. 1977a). For example, although Peary Caribou had been consistently recorded on Brock, Eglinton and Emerald islands in 1961, 1972-74 and 1987-88, they were not seen in 1997 (Gunn and Dragon, 2002) when population numbers were very low in the region. They were once again confirmed present in 2012 (Davison and Williams 2012), corresponding with a population increase (Appendix 1).

The Bathurst Island complex and surrounding islands have been subjected to the most significant survey effort within the WQEI, with available data spanning a 50-year period. This provides a window into caribou spatial distribution across seasons and over periods of both high and low population abundance (Poole *et al*. 2015).

Eastern Queen Elizabeth Islands

The two largest islands that make up this subpopulation are ca. 240,000 $km^2$ in area. In contrast to WQEI, a majority of the area is above 300m elevation and covered by glaciers and ice caps, and hence unusable for Peary Caribou. Recent surveys (Jenkins *et al*. 2011; Anderson *et al*. 2014; Anderson and Kingsley 2015) have recorded Peary Caribou on Ellesmere and Axel Heiberg islands on all non-glacier-covered areas of both.

## Search Effort

Peary Caribou distribution is known from aerial surveys that have covered most islands and the experience of local and traditional knowledge, mostly through hunting.

In areas accessible from the eight settled Inuit and Inuvialuit communities within Peary Caribou range (Figures 1-3), many families and individual hunters, trappers and fishers from Inuit and Inuvialuit communities spend weeks or months at all seasons out on the land. The widespread adoption of snow machines since the 1970s or use of bush planes to reach remote camp sites has made it possible for individual hunters to cover a greater distance searching for caribou or Muskoxen (*Ovibos moschatus*) (Condon, 1996). In areas that people visit regularly, the specific skills required to pursue cultural traditions results in a high overall level of awareness of caribou and other wildlife distribution, density, and condition (c.f. Dumond 2007; SARC 2012, 2013).

Information particular to wildlife management is also shared in meetings of local hunters and trappers associations, and between them and regional wildlife management boards. In this way, knowledge of status, movements, and condition of wildlife is accumulated and disseminated within and among villages. People in remote villages are, therefore, aware of wildlife events throughout the territories and beyond. Such knowledge may be variously understood, interpreted, or communicated by different individuals, but nevertheless becomes shared community knowledge.

The distribution patterns and trends of Peary Caribou are less known in areas that are remote from communities. Most incidental observations of Peary Caribou are derived from hunting trips (SARC 2012; CWS 2013). Frequency of individual hunting expeditions is also declining. For example, fewer hunters in Sachs Harbour and Ulukhaktok hunt for caribou than in the past (Condon 1996; Collings and Condon 1996; Nagy 1999; Pearce *et al.* 2011), and unreliability of snow and ice conditions has families preferring to travel along the coast rather than inland (Riedlinger 2001). Cambridge Bay residents remarked in community meetings that travel to the northern part of Victoria Island is uncommon (Ekaluktutiak HTA 2013). Similarly, Gjoa Haven residents travel too infrequently to Prince of Wales, Matty and Tennet islands to know when caribou are there or how numbers have changed over time (Gjoa Haven HTA 2013). Sachs Harbour members indicated that due to changes in hunting practices, people no longer spend long periods travelling on the land on Banks Island following caribou, and now seldom venture further than 50 miles north of town (Sachs Harbour HTC 2013).

Search effort to measure spatial distribution within each of the four subpopulations has also been based on aerial surveys of each island. The frequency and coverage of these surveys has been highly variable since the first systematic surveys in 1961 (see **Sampling Effort and Methods**; Table 2). It is, however, unlikely that there are unexplored areas within Peary Caribou range, given the nature of the systematic effort and extent of coverage in an overall sense. Nevertheless, distribution and abundance through time in most subpopulations is not well known, and even current distribution is unknown in parts of the range.

## HABITAT

Peary Caribou live primarily in High Arctic and Middle Arctic tundra (Olson *et al*. 2001; Figure 4).

The climate of Peary Caribou range is unpredictably variable and severe, with short, cool summers and long, cold winters. The growing season (breaking dormancy to 50% leaf colouration) is relatively fixed within 50-60 days for plant species (Svoboda 1977). Snow cover is generally present from September to May (Banks Island) or mid-late June (Melville Island) (SARC 2012).

Climate data are available from only eight meteorological stations across the Peary Caribou range, and these are all coastal. Hence, they are more representative of conditions on QEI, and not the large continental island areas of Banks and Victoria islands. For example, summer temperatures in interior Banks Island can be as much as 10$^{o}$C higher than those recorded by the Sachs Harbour weather station (N. Larter, pers. comm. 2015).

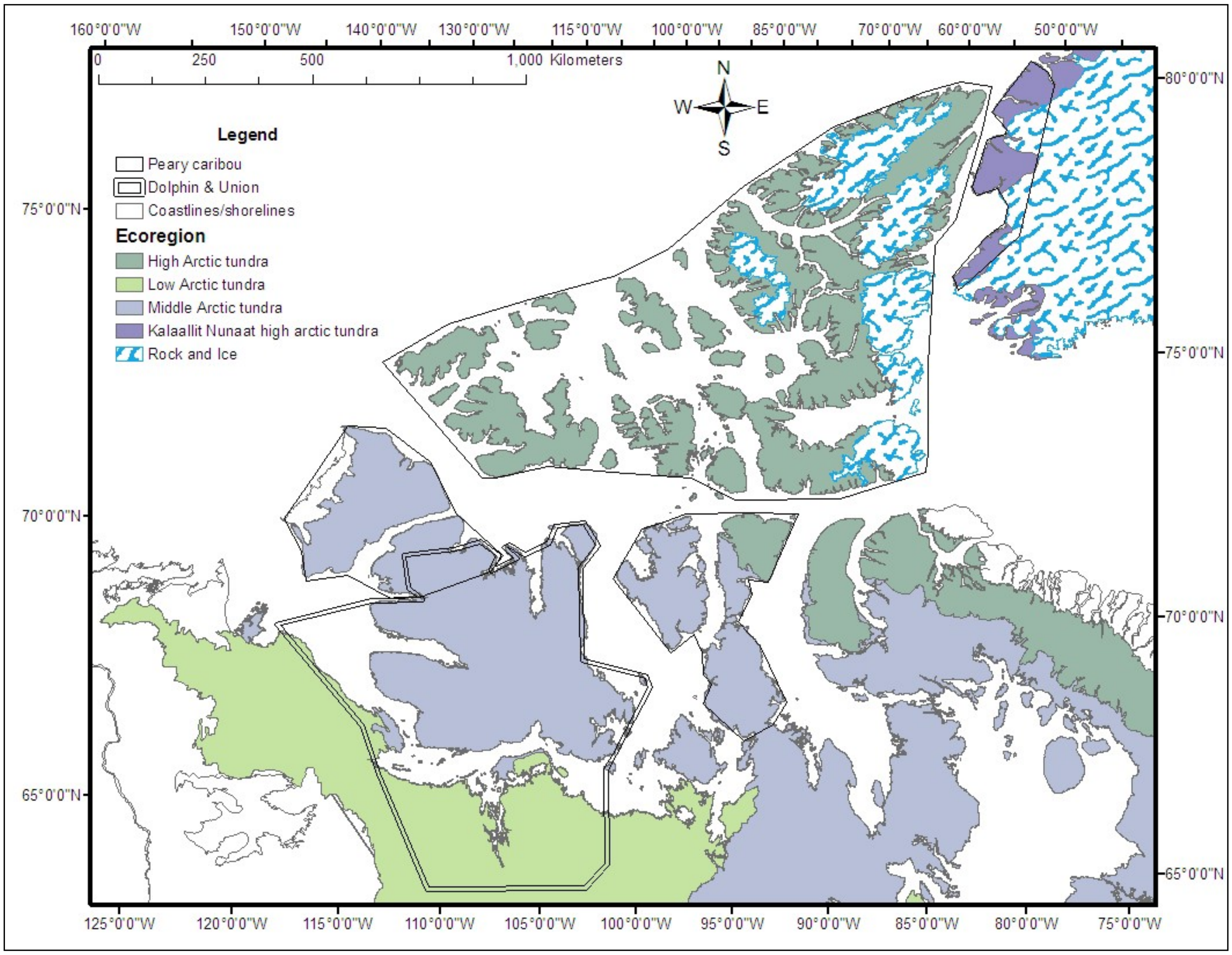



Figure 4. Terrestrial ecozones in the Arctic Archipelago (based on Olsen *et al.*, 2001).

Since 1980, spatial climate data have become available at the scale of 1/2 degree latitude by 2/3 degree longitude from the Modern Era Retrospective Analysis for Research and Applications (MERRA) dataset. MERRA data from 1980 - 2014 for island or island groupings for Peary Caribou demonstrate how climate variables vary across Peary Caribou range with east-west and north-south gradients; there is also a high degree of annual variability, which itself varies regionally (Russell *et al*., 2013). For example compared to Banks Island, Bathurst Island has fewer cumulative growing degree days (GDD) (the base temperature below which plant growth is zero) > 0 in June and July (230 ± 20.0 SE vs. 557 ± 34.0 SE). This result is best explained by its location further north, but also by its smaller landmass with an incised coastline. It also has a later onset of plant growth (up to a 10-fold mean difference on 15 June), which is characterized by higher annual variability than Banks Island.

The climate across the Arctic islands is strongly regionalized with east-west and north-south gradients in precipitation and temperature due to the influence of Pacific air masses in the west and Atlantic air masses in the east (Maxwell 1981). It is these intrusions that periodically cause warmer temperatures during snowstorms leading to icing and dense, deep snow (Rennert *et al*. 2009). Decadal-scale atmospheric pressure oscillations in the north Atlantic and north Pacific complicate trend analysis of weather patterns. Spatial diversity of climate regimes across the range of Peary Caribou creates a great diversity of vegetation types, with implications for how each subpopulation responds to climate variation.

Land dominated by dry vegetation covers about 36% of the ice-free area within Peary Caribou range. Above-ground plant biomass ranges from < 100 $g/m^2$ in much of the QEI and parts of the Prince of Wales-Somerset group with some areas having up to 500–2000 $g/m^2$ on Banks Island and Prince of Wales Island (Gould *et al.* 2003). Net primary productivity is 0–50 $g/m^2/yr$ over most of the range of Peary Caribou, with 150–250 $g/m^2/yr$ on parts of Banks Island and Victoria Island (Gould *et al.* 2003). Banks Island has the greatest extent of area with high plant biomass (>1000 $g/m^2$), shrub cover and primary productivity of all Peary Caribou subpopulation ranges (Gould *et al.* 2003).

Permafrost is continuous throughout and only a thin (~40 cm—Callaghan *et al.* 2005) active layer thaws during summer, limiting dominant vegetation to flowering perennials such as saxifrage (*Saxifraga* spp.), Arctic Poppy (*Papaver radicatum*), Moss Campion (*Silene acaulis*), louseworts (*Pedicularis* spp.), and Mountain Sorrel (*Oxyria digyna*), as well as mosses, rushes, grasses, sedges, and dwarf shrubs (e.g., *Salix* spp., *Dryas* spp.).

## Habitat Requirements

Peary Caribou use a wide variety of habitats and are most commonly found on upland polar desert and tundra habitat types that are mesic-xeric with sparse-moderate vegetation cover at intermediate-high elevations (Parker and Ross 1976; Wilkinson *et al.* 1976; Miller *et al.* 1977a, b; Russell *et al*. 1978; SARC 2012). In the WQEI, Thomas *et al.* (1999) showed that the Peary Caribou did not use or select habitat types with the greatest vegetation cover and standing crop. The latter study demonstrated that caribou pellet densities in summer were greatest in sparsely vegetated upland ridges where lichens, willow, wood rushes (*Luzula* spp.*)*, Arctic Poppy and Long-stalked Starwort (*Stellaria longipes)* were relatively abundant. Winter forage sites were typically characterized by high densities of *Luzula* spp*.* and lichens.

Studies have been conducted during snow-free periods on forage availability, plant standing crop, biomass, above-ground primary productivity, and abundance of plant species or groups (Larter and Nagy 2001a; Gould *et al.* 2003, Larter and Nagy 2003). Generally, these studies showed that there was more forage or available plant biomass than was necessary for adequate nutrition, although it may not be accessible during winter due to snow conditions.

The low densities of Peary Caribou, their relatively small group size and their mobility while foraging usually prevent overuse of forage sites despite the characteristically low productivity of such ranges (e.g., Parker 1978; Miller and Kiliaan 1981). Unfortunately, as noted by Miller *et al.* (1977a:46), "…we have no quantitative measures of range condition" associated with declines of Peary Caribou and this knowledge gap persists. Overall, studies have suggested that, while forage availability may not limit Peary Caribou populations, high densities could in theory affect vegetation and there is potential for competition among herbivores under certain conditions. Only limited research has been conducted on linkages between foraging and snow conditions in relation to subpopulation dynamics (Larter and Nagy 2000a; 2001b) and this research has not been conducted during all phases of high and low populations for all subpopulations (Tyler 2010; but see below for Banks Island).

Of importance to Peary Caribou is energy accumulation during the short plant growing season, which can drive fitness for the rest of the year. This implies some degree of behavioural plasticity to allow animals to respond to the variation in forage availability. Most evidence for such plasticity comes from Svalbard, a high arctic island group north of Norway where Svalbard reindeer (*Rangifer platyrhynchus*) increase movements when ground-fast icing restricts forage (Meland 2014). The Svalbard reindeer switch between selecting forage quality versus quantity depending on changes in abundance of lichen, moss/graminoids, and parasite avoidance strategies (Van der Wal 2006).

## Diet

Peary Caribou diet has been relatively well studied in the western Arctic (Shank *et al*. 1978; Thomas and Kroeger 1980; Thomas and Edmonds 1983; Larter and Nagy 1997; Lenart *et al*. 2002). Peary Caribou have a broad/varied diet and are versatile feeders with diet varying seasonally in relation to available forage and corresponding nutritional content.

Diet on Banks Island has been described when Peary Caribou numbers were increasing (Shank *et al*. 1978) and decreasing (Larter and Nagy 1997) in the context of overlap with Muskox diet. Thomas and Kroeger (1980) examined the summer and winter digestibility of forage using caribou from Prince of Wales Island. Digestibility was greater for sedges in winter than summer; the digestibility of the White Worm Lichen *Thamnolia vermicularis* was 18% in summer in contrast to 62% in winter, but the digestibility of mosses was higher in summer than winter. Thomas and Edmonds (1983) reported on late winter diet from across the WQEI to Prince of Wales and Somerset islands. In that study, lichens comprised 2-15%, while sedges and mosses provided 15-57% and 13-58%, respectively. In summer, caribou select forage high in digestible protein by foraging on flowers especially Purple Saxifrage (*Saxifraga oppositifolia*), lousewort, and Arctic Poppies (Parker and Ross 1976; Parker 1978) and made high use of willow leaves on Melville and Axel Heiberg islands. During unusually severe winters caribou are restricted to a diet with highly indigestible forage such as willow twigs, which can result in malnutrition (Parker 1978).

Measurements of diet have shown that lichens comprise a relatively low proportion of winter and summer diet for Peary Caribou compared to Barren-ground (reviewed by Wilkinson and Shank 1974; Miller 1998; Larter and Nagy 2004). For example, in a study on Banks Island, lichen was of minor dietary importance, likely because of its low availability (standing crop 2.96 $g/m^2$), whereas sedges, willows, legumes (*Astragalus* spp., *Oxytropis* spp.), and *Dryas integrifolia* dominated the diet (Larter and Nagy 1997; Larter and Nagy 2004). Inuvialuit TK reveals that Peary Caribou eat lichens (genera *Cladina* and *Cladonia*), known broadly as “tuktut niqait” (“tuttut niqingi” in Uummarmiutun), or ‘caribou food’; Snow Lichen (*Flavocetraria nivalis*) and White Worm Lichen known as “aqiarungat” or “akeagonak”; and various kinds of rock lichens, known generally as “qaviut” (Bandringa 2010). Caribou winter range is often correlated with the abundance of lichens *Cetraria delisei* and *Thamnolia vermicularis*, crustose lichens, and grasses (e.g., Alpine Foxtail [*Alopecurus alpinus*]) and rushes (e.g., Two-glumed Rush [*Juncus biglumis*]). On eastern Melville Island, Thomas *et al.* (1999) found that the amount of lichens in the winter diet of Peary Caribou depended on snow conditions, with lower occurrence of lichen in the diet in years with deeper, harder snow.

The low proportion of lichens in the diet measured either from rumen or fecal pellet samples may reflect that lichens are scarcer in Peary Caribou range than on the ranges of other caribou (Thomas *et al*. 1999, Russell *et al*. 1978). A likely reason is the underlying substrates are mostly alkaline and unfavourable to lichens. A possible parallel might be the low occurrence of lichens on Svalbard where the vegetation following reindeer grazing from 1978 to 2013 shifted from lichens to more productive and resilient moss-graminoids (van der Waal *et al*. 2001, Ronning 2014). However, where reindeer declined, fruticose lichens have recovered after 100-200 years (van der Waal *et al*. 2001).

Peary Caribou usually forage while walking, rather than by feeding in place as Muskoxen do (COSEWIC 2004 and references therein). Caribou can average 3-4 km of travel per hour while actively foraging (Miller *et al*. 1982). Under ideal conditions when the snow is soft and relatively shallow, caribou forage by simply pushing the snow off the vegetation with their noses. As snow density increases, they dig small individually scattered craters, unlike the large cratered areas often used by groups of Muskoxen and groups of Barren-ground Caribou. When snow cover becomes too hard and dense, Peary Caribou seek forage on snow-free sites or sites with only shallow snow cover (e.g., exposed wind-swept areas). On Banks Island, they often feed in winter by cratering in the snow of upland habitats (upland barrens, hummock tundra, and stony barrens) where it is softer and shallower than in wet meadows (Larter and Nagy 2001b).

## Habitat Trends

Essentially all historical Peary Caribou habitat is available and has not been lost or fragmented by industrial or other anthropogenic developments. There is little potential habitat that is currently unoccupied, other than Prince of Wales-Somerset group of islands and Boothia Peninsula.

At community information meetings conducted during Environment Canada-led recovery meetings, members of the Cambridge Bay HTO (2013) expressed concerns that past activities have affected caribou habitat. There were also multiple comments about past exploration activities leaving contaminated sites and fuel drums from Gjoa Haven, Grise Fiord, and Resolute Bay community members (Gjoa Haven HTA 2013; Iviq HTA 2013; Resolute Bay HTO 2013).

Under a changing climate, habitat changes (e.g., vegetation changes [productivity and shrub growth] and snow conditions) for Peary Caribou have already occurred (SARC 2012) and the rate of these changes is projected to increase (see **Threats-Climate Change**).

## BIOLOGY

Caribou and reindeer are polygynous (c.f. Holand *et al*. 2007), but little is known of the Peary Caribou mating system (Petersen *et al*. 2010). The small group size typical of Peary Caribou (Tener 1963; Miller *et al*. 1982; Nagy *et al*. 1996) suggests a harem-guarding mating system.

### Life Cycle and Reproduction

Peary Caribou have widely variable vital rates. Productivity (the proportion of females with calves) in the WQEI has varied from 0 to 88%, and on Banks Island from 3 to 33% between 1970 and 2010 (SARC 2012). Overwinter calf survival on Banks Island from 1991-1999 varied from 23 to 86% (SARC 2012). Information on adult sex ratios is generally lacking, as are data on longevity and age at last reproduction. ATK indicates that Peary Caribou females in good condition can calve every year after sexual maturity is reached at 2 to 4 years of age, but hunters report finding no fetuses in harvested caribou after harsh winters (SARC 2012 and references therein).

Information regarding generation time is lacking for Peary Caribou. COSEWIC (2004) estimated the intergeneration time for Peary Caribou at 7 years, although no rationale was provided; this was also adopted by SARC (2012) for the NWT assessment. Females may live to 15 years in the wild (SARC 2012). They presumably are fecund for their whole adult lives (at least 13 years, the maximum age sampled—Thomas *et al*. 1976), although senescence has been observed in reindeer between the ages of 7 and 11.5 years (e.g., Weladji *et al*. 2010). Hence, the median age of Peary Caribou parents could be up to 8.5 to 9.5 years. Given the IUCN definition of generation length as the average age of parents of the current cohort, and reflecting the turnover rate of breeding individuals in a population (IUCN 2014), Peary Caribou generation time was established as 9 years for the purposes of this assessment.

### Physiology and Adaptability

Peary Caribou are adapted to limited plant growth with a highly compressed growing season and long periods of snow-covered frozen standing vegetation (see **Habitat**).

Despite their modest genetic differentiation, behavioural and morphological differences between Peary and Barren-ground Caribou are assumed to result from strong selection pressure in their high Arctic environment (Manning 1961). Given that shorter body extremities minimize external surface area and heat loss, it may be that the adaptive value of a shorter broader muzzle of Peary Caribou also prevents heat loss while maintaining a long enough molariform tooth row to forage effectively.

Tener (1963) and others noted the small group size of Peary Caribou (typically a dozen or fewer) and widely dispersed aggregations relative to Barren-ground Caribou (often in herds of 1,000 or more). Group size increases slightly prior to calving, stabilizes or decreases during calving and then increases into post-calving aggregations as they move inland from coastal areas (Nagy *et al*. 1996). However, the post-calving aggregation is a relative term as the group sizes are tens of individuals not the hundreds to thousands typical of Barren-ground Caribou. The underlying mechanisms may differ; small group size and dispersion may be an adaptation to an environment with thin and patchy forage (relative, to mainland caribou ranges), avoidance of predation, and/or lack of insect harassment.

The forage biomass of some Peary Caribou habitats (e.g., Banks Island—Larter and Nagy 2001a), and the relatively low prevalence of mosquitoes and warble flies, which allows for uninterrupted foraging (Gunn and Skogland 1997), can lead to accumulation of substantial fat stores. The accumulation of fat reserves in the summer and autumn is critical to survival and reproduction in severe winters (Thomas 1982; Nagy *et al*. 1996).

### Dispersal and Migration

Peary Caribou move relatively long distances, including annual migrations across sea ice, regular movements within multi-island home ranges and erratic large-scale movements among islands during severe winters (see **Population Spatial Structure and Variability**; Figure 3).

The islands of the Canadian Arctic Archipelago are surrounded by ice for ≥ 9 months each year (Miller *et al*. 2005b); most inter-island crossings by Peary Caribou occur during the period of highest quality and concentration of fast ice, corresponding with travel to winter and spring/summer ranges (Jenkins and Lecomte 2012). However, there are also observations of Peary Caribou swimming between islands during seasonal movements (Miller 1995a).

There are many records of Peary Caribou crossing the sea ice in seasonal migrations among the islands and between the mainland and Arctic Islands. These are not necessarily fixed migration routes that are used habitually, but rather broad migration zones that individuals use to travel from winter ranges to calving areas and summer ranges (Miller *et al*. 2005b). For example, Miller *et al*. (2005b) documented 73 crossing sites representing 850 Peary Caribou trails on northeastern Franklin Strait (between Boothia Peninsula and Prince of Wales Island) and Peel Sound (between Somerset and Prince of Wales Islands) in three years (1977-1980). These crossings were also relatively evenly distributed, regardless of the length of the sea-ice crossing site or the elevation at its origin or terminus. There is also some evidence to support forced dispersal during winters characterized by icing events or above average snow fall (see SARC 2012).

Little is known about dispersal except that mtDNA analyses showed a low frequency of recent (“within the last several generations”) unidirectional dispersal from WQEI into Banks Island, Northwest Victoria Island, and the Prince of Wales-Somerset islands; and from the latter to Banks Island and the Boothia Peninsula (McFarlane *et al.* 2014).

## Interspecific Interactions

Muskoxen

There has been substantial concern, particularly at the community level, about interspecific interactions between Muskoxen and Peary Caribou. ATK and community knowledge has emphasized this issue (see SARC 2012). Inuit from Resolute Bay and Grise Fiord reported that “a large abundance of Muskoxen is often followed by the decline in the population of caribou in a specific area” (Taylor 2005). In Environment Canada recovery meetings, community participants have identified competition with Muskoxen as a major threat to Peary Caribou, as would be suggested by evidence of displacement of the latter by the former, or contrasting population trends (Olohaktomiut HTC 2013; Paulatuk HTC 2013; Spence Bay HTO 2013).

Historically, on Banks Island, northwestern Victoria Island, and Prince of Wales-Somerset islands, Peary Caribou and Muskoxen have had opposite trajectories in abundance (Gunn *et al.* 1991; Gunn and Dragon 1998; Nagy *et al.* 2009e; Davison *et al.* 2013). By the late 1980s, concurrent with a major decline of Peary Caribou on Somerset Island, hunters noted that areas previously occupied by caribou were now occupied by Muskoxen (cited in Taylor 2005). Recent disease-associated declines of Muskoxen on Banks and Victoria islands (Kutz *et al*., 2015) have not been accompanied by as rapid an increase in Peary Caribou as historically observed (see **Threats and Limiting Factors**). The bacteria isolated from Muskoxen as a disease-causing agent is a generalist and also able to infect caribou; however, its role in the current Peary Caribou population dynamics is uninvestigated. Concurrent declines in both Muskoxen and Peary Caribou have also been observed, for example, on WQEI, although there were differences in the rates of recovery (Miller *et al.* 1977b; Gunn and Dragon 1998; Anderson 2014). Weather-related events are often implicated in these concurrent declines.

The frequent comments in recorded Inuvialuit ATK (e.g., Peter Esau quoted by Berger 1976) suggest that Peary Caribou and Muskoxen are competitors for forage. On the other hand, Parker (1978) concluded that in winters with average snow conditions on Bathurst Island, there is no interspecific competition with Peary Caribou and Muskoxen. However, he suggested that in severe winters there could be competition as both species sought willows on exposed slopes and ridges. During the 1973-1974 severe winter when many individuals of both species died on Bathurst Island, a retrospective analysis suggested there was no interspecific competition between them because the fecal pellet densities were negatively associated with one another and relationships with certain forage species contrasted significantly (Thomas *et al.* 1999).

Investigators have largely compared habitat use or forage overlap between the two species as a means of indirectly assessing competition. On Banks Island, Wilkinson and Shank (1974) and Vincent and Gunn (1981) found no evidence to suggest competition between Peary Caribou for forage or space. As abundance of Muskoxen increased during the 1990s, studies did, however, reveal that diets overlapped (Larter and Nagy 1997; 2004), but this is not in and of itself indicative of competition. The potential for apparent competition under certain conditions cannot be ruled out. Jenkins (2006) suggested that caribou may avoid Muskoxen to avoid predation by Wolves. Gunn *et al.* (2011) also speculated that "…the increasing Muskox abundance supported increased Wolf numbers which, in turn, could increase predation rates on Peary caribou."

Several observers have noted that the spatial segregation between Peary Caribou and Muskoxen may have a deeper, behavioural basis than habitat preferences. Segregation has been reported on Banks Island (Kevan 1974 and others; Wilkinson and Shank 1974), Melville Island (Thomas *et al*. 1999), Axel Heiberg (Tener 1963), Bathurst Island (Ferguson 1987) and Ellesmere Island (Jenkins 2006; Manseau *et al*. 2004; Tener 1963). People in Ulukhaktok suggested that the caribou had moved toward Cambridge Bay to escape the Muskoxen at Minto Inlet (Gunn 2005). Inuvialuit and Inuit ATK has many references to caribou avoidance of Muskoxen because they dislike their smell, or simply because "caribou don't like Muskox" (Ulukhaktok residents quoted by Kassam 2009; Ekaluktutiak HTO 2013; Iviq HTA 2013; Palaulatuk HTC 2013). ATK suggests that caribou may avoid areas of high Muskox use because they trample the vegetation and pack the snow, which impedes feeding by caribou (SARC 2012).

### Predation

Sachs Harbour residents have previously linked the high Wolf numbers with the increasing Muskox numbers and declining Peary Caribou on Banks Island (Sachs Harbour Community Conservation Plan 1998 cited in SARC 2012). On Banks and northwestern Victoria islands, Muskox populations greatly increased in the 1960s after a 1955–1959 poisoning program reduced the number of Wolves (Heard 1984). Nagy *et al.* (1996) noted that Wolf populations had increased "dramatically" on Banks Island during a period of Muskox increase/caribou decline, that Wolf predation on caribou had been observed, and that "Peary caribou on Banks Island may be in a situation … where a high bio-mass of Muskoxen supports an increasing Wolf population… Even if predation rates on caribou are low, the impact may be significant especially given their recent low numbers." Nagy *et al.* (2013) noted that 1998 was the first time in 20 years that the Muskox population on Banks Island showed signs of decreasing while the number of Wolves seen during ungulate surveys continued to increase.

Similarly, on northwestern Victoria Island, a survey of local knowledge showed that Wolves had increased from the 1970s through the 1990s, coincident with the increase of Muskoxen and decline of Peary Caribou (Gunn 2005). Gunn (2005) suggested that higher numbers of Muskoxen could maintain high numbers of Wolves and lead to relatively high predation on the remaining caribou.

Other predators include Grizzly Bears (*Ursus arctos*) and Wolverines (*Gulo gulo*). Arctic Foxes (*Vulpes lagopus*) sometimes attack juvenile caribou (SARC 2013). Community members within the two southern Peary Caribou subpopulations report increasing numbers of recent sightings of Grizzly Bears and/or Wolverines (Ekaluktutiak HTA 2013; Gjoa Haven HTA 2013; Sachs Harbour HTC 2013; Spence Bay HTO 2013).

**Pathogens**

The prevalence and intensity of parasite infections and diseases in Peary Caribou is little known. One caribou parasite that is relatively easily tracked is the warble fly but the prevalence of warbles parasitizing caribou on Banks or northwestern Victoria islands is not known. On Melville and Prince Patrick islands, 11 and 16% of Peary Caribou, respectively, collected in 1974-79 had warbles (Thomas and Kiliaan 1990). Almost the only information on other parasites and diseases is from Banks Island where Inuvialuit report tapeworm cysts in the muscle of Peary Caribou: the primary hosts of the tapeworms are wolves or foxes (*Vulpes* spp); numbers of cysts in the caribou vary and may be related to fox cycles (Nagy *et al.* 1998).

More is known about diseases in Muskoxen on Banks Island, but it is unknown whether Muskox diseases and parasites are a threat for Peary Caribou. Some parasites and diseases recorded for Muskoxen have not been found in Caribou, including Yersiniosis, which is prevalent among muskoxen (Larter and Nagy 1999). *Giardia* is found in Muskoxen but not in caribou although another protozoan parasite, *Cryptosporidium*, was in 22% of Peary Caribou fecal samples from Banks Island in the 1990s (Nagy *et al.* 1998).

Barren-ground Caribou and Muskoxen share several parasites, including gastrointestinal helminths and a species of lungworm (Kutz *et al*. 2012), and are susceptible to a number of the same pathogens, including the bacteria *Brucella suis* and *Erysipelothrix rhusiopathiae* (see **Threats and Limiting Factors**). Parasite-mediated competition between caribou and Muskoxen has been postulated with respect to the abomasal nematodes *(*Hughes *et al*. 2009*)*. The abomasal nematodes, *Teladorsagia boreoarcticus* and *Marshallagia marshalli,* are associated with poorer body condition (both) or protein indices in Muskoxen and caribou, respectively (Steele 2013; Kutz *et al*. unpubl. data). These species are common in Muskoxen, and the relative abundance in caribou appears to increase where they are sympatric with Muskoxen (Hughes *et al*. 2009; Kutz *et al*. 2012; Steele *et al*. 2013). In the Kangerlussuaq area, west Greenland, Barren-ground Caribou have a parasite fauna dominated by parasites also found in the introduced Muskoxen. *Marshallagia marshalli* is associated with lower protein and kidney fat indices in barren-ground caribou in Greenland (Steele *et al*., 2013). Studies to date have been inadequately designed to assess the effect of *T. boreoarcticus* on caribou; however, this parasite negatively impacts body condition in Muskoxen (Kutz, Nagy, Checkley unpubl. data) and the related nematode of caribou, *Ostertagia gruehneri,* negatively impacts body condition and pregnancy in caribou and reindeer (Irvine *et al*., 2001; Steele 2013).

A parallel with Peary Caribou may be the documented sub-clinical effects of parasitic nematodes on Svalbard reindeer. In Svalbard reindeer, gastro-intestinal nematodes affected body weight sufficiently to reduce pregnancy rates (Irvine *et al*., 2001), which does suggest that parasites may have sub-clinical effects. Those effects include changes in foraging behaviour to avoid the risk of infection (Van der Waal *et al.* 2000).

## POPULATION SIZES AND TRENDS

### Sampling Effort and Methods

Survey design in the Arctic Archipelago has to account for low densities and a widespread distribution of animals (Gunn and Poole, 2014). The enormous size (7% of the total area of Canada) and remoteness of the area, which has few operational bases, are logistical constraints. As a result, surveys have been infrequent, with each covering only one or a subset of islands at a time. Evaluating trends in abundance for Peary Caribou since the first surveys were conducted in the 1960s is made difficult by irregular frequency in surveys (in time and space), as well as changes in survey design and methodology (Gunn and Poole, 2014).

Most surveys were aerial strip transects and extrapolated densities observed within the strips to off-transect areas, under the assumption that Peary Caribou are evenly distributed within strata. Most surveys have been stratified, applying higher effort in areas of known or suspected high relative densities, and less effort spent in other areas. Not all investigators have differentiated age classes; those who did have reported “non-calves” or yearlings plus adults, or “short yearlings” (the previous summer’s calf crop at about 10 months old) plus adults, depending on the time of the survey. Increasing survey accuracy (i.e., by reducing survey altitude and transect width) with the same survey effort results in decreases in precision, because coverage is less (Gunn and Poole, 2014). Precision is usually, but not always (especially in earlier years), a measure of variance (i.e., 95% confidence interval [CI] or standard error [SE]). Otherwise, population numbers are minimum counts, which are also sometimes generated from unsystematic aerial searches or surveys for other species (e.g., Muskoxen). Telemetry by VHF radio or satellite transmitters was applied on Banks, Bathurst and Ellesmere islands, which increased description of seasonal movements for Bathurst Island (Poole *et al.* 2015) but elsewhere the telemetry remains unreported.

Bias through sightability of animals (pelage relative to background, lighting conditions, etc.) and observer experience is likely high and typically unmeasured (Gunn and Poole, 2014).

The first systematic aerial surveys for Peary Caribou (and Muskoxen) were led by J.S. Tener in 1961 across the QEI (Tener 1963). The researchers applied stratification but did not allocate survey effort by caribou density as prior information was unavailable. Bias was likely similar to other surveys given the narrow strip width and survey altitude. While Tener did not calculate the variance of the estimate, a subsequent recalculation of the estimates conducted by Miller *et al*. (2005b) included confidence limits. Consequently, the coefficient of variation (CV) for western and eastern portions of the study area was 8% and 22%, respectively, which reflects the coverage and is similar to the precision of subsequent estimates. Tener's (1963) surveys resulted in a provisional Peary Caribou abundance estimate of 25,845 individuals on the QEI (two of four subpopulations recognized in this assessment). This included 12,799 caribou on Melville Island alone (Tener 1963).

Concerns were raised by Inuit in Grise Fiord and Resolute Bay that the Peary Caribou population could not have been as high as reported by Tener (Ferguson *et al.* 2001), and these doubts have persisted in recent Environment Canada-led technical community meetings during recovery planning for this species (e.g., Iviq HTA 2013; Resolute Bay HTO 2013). On the other hand, Tener's (1963) estimated abundance for Bathurst Island in 1961 was similar to the estimates recorded in 1993 (Miller 1995b) and 2013 (Anderson, 2014). The recent surveys since the last status report include Jenkins *et al.* (2011) who reported population numbers in Nunavut (with the exception of Byam Martin, eastern Melville, eastern Mackenzie King, and Borden islands) during 2001-2008. They used a combination of spring aerial and winter snowmobile surveys and distance sampling (Buckland 2001), using line-transect methods to estimate density and abundance of adults and short yearlings.

Most surveys used transects on individual islands or groups of islands, which is advantageous for comparing estimates between years. In other areas, as has been shown with reindeer on Svalbard (Norway), even slight differences in consecutive survey areas can lead to underestimates and inter-annual variations in abundance (Lee *et al.* 2015). Because most recent aerial surveys have been conducted during summer, only summer surveys are presented here for those islands that had multiple surveys in a single year so as to maintain consistency across years. Densities (number of caribou per area surveyed) were calculated from caribou counts along transects, and in turn were used to estimate caribou abundance for a given survey area (usually island).

Abundances reported from various surveys were not consistently extrapolated to the same area for all the surveys over the past several decades. To ensure consistency, Johnson *et al*. (in prep.) recalculated island areas (after Nagy *et al.* 2009) using a land mask that was generated from the CanVec dataset, an open source digital cartographic reference product produced by Natural Resources Canada (Government of Canada 2015). They used the Canada Albers Equal Area Conic projection to generate area estimates, which are used consistently in this assessment to establish area-corrected abundance estimates. Area-adjusted estimates assume uniform density within each surveyed island, which although unlikely, facilitates comparisons across years (Johnson *et al.* in prep.). Precision was not accounted for in those area-corrected estimates (Appendix 1).

From 1961 to 2014, government agencies conducted a total of 154 aerial surveys to estimate Peary Caribou abundance throughout the Canadian Arctic (Table 2; Appendix 1). Survey frequency and spatial extent have been highly variable across this geography over these 53 years. The most frequently surveyed islands have been Banks Island (Banks-Victoria subpopulation) and Bathurst Island (Western QEI subpopulation). Gunn and Poole (2014) calculated coverage (the percentage of the total area that was surveyed) and precision (Coefficient of Variation; CV) on an island-by-island basis. On average, across the four subpopulations, coverage was between 14-33% and precision 17-33% (Table 2).

**Table 2. Summary of the number of surveys by subpopulation of Peary Caribou, from 1961-2014. Source: Gunn and Poole (2014).**

| Subpopulation | Precision (CV) (%) | Coverage (%) | Number of Surveys | Time Period |
|---|---|---|---|---|
| Banks-Victoria | 31 | 18 | 39 | 1970 to 2014 |
| Prince of Wales-Somerset-Boothia | 17 | 15.5 | 26 | 1974 to 2006 |
| Western QEI | 26 | 33 | 79 | 1961 to 2013 |
| Eastern QEI | 22 | 14 | 10 | 1961 to 2007 |

Where possible, number of adults (> 1 year) was used to approximate number of mature individuals. Some surveys did not report calf estimates. The number of mature individuals was estimated for each subpopulation by summing the abundances across major islands with relatively frequent surveys during the same time period; a rough estimate of total abundance was derived from summed abundances across the four subpopulations.

There has been no single year where the entire range has received full coverage, nor has this been attempted since Tener's 1961 survey (Tener 1963). Overall three-generation and two-generation trends for Peary Caribou and those for each of the main subpopulations are estimated here through comparisons of area-corrected survey estimates for each of the main islands in each subpopulation (see **Abundance**).

These abundance and trends estimates have much compounded uncertainty owing to factors ranging from errors in survey estimates (discussed above), later onset of reproductive capability for Peary Caribou yielding overestimates of mature individuals (see **Life Cycle and Reproduction**), variable survey methods, variable ranges of the time span among islands to approximate 3-generation or 2-generation population trends, lack of precision in the land area, and unmet assumptions associated with the area-corrected estimates (see above).

## Abundance

The most recent surveys for Peary Caribou across the subspecies' High Arctic range yield an estimated total of about 13,700 adult and yearling Peary Caribou (Table 3). However, this estimate is derived from a subset of all islands, some of which were not surveyed within the last decade. Hence, the certainty associated with this estimated population is low.

## Fluctuations and Trends

The summed abundances across islands serve as average estimates of Peary Caribou population size through time (Table 3; Figure 5). Periodic stochastic (and unpredictable) die-offs are a feature of Peary Caribou ecology as described in following subpopulation sections (Miller *et al.* 1977a; Parker 1978; Harding 2004; Festa-Bianchet *et al.* 2011). These events may not all be known, because the long periods between surveys may have resulted in missing some abrupt declines and subsequent recoveries. Neither die-offs nor periods of increase appear to be synchronous across Peary Caribou range based on available information. The following section describes abundance patterns derived from scattered surveys within each subpopulation over the past five decades.

### <u>Banks-Victoria</u>

The most recent surveys from Banks Island (2014; Davison *et al.*, 2014) and northwestern Victoria Island (2015; Davison and Williams 2013), respectively, indicated a total of about 2,252 mature individuals for this subpopulation (Table 3; Appendix 1). Surveys from the late 1980s point to a considerably higher population (> 8,000), with an overall decline in three generations (27 years) of approximately 68% for both Banks and Victoria Islands combined. The latest surveys have indicated a modest increasing trend in numbers of mature individuals on Banks Island, whereas numbers on Victoria Island may have declined again more recently (Figure 5; Appendix 1).

According to local community knowledge (cited by Usher 1971), caribou numbers had fluctuated with severe winters in the early 1950s, causing deaths and desperation movements off Banks Island. Early estimates by quantitative surveys on Banks Island were 4,000 adults and calves in 1952–1953 (Manning and Macpherson 1958), 2,351 caribou in 1959 (MacPherson 1960), 5,000-8,000 in 1970 (Kevan 1974), and 12,098 in 1972 (Urquhart 1973). The 1970 and 1972 estimates were from systematic aerial surveys although Kevan (1974) only surveyed the northern half of Banks. Before 1972, observers said that most or all caribou were concentrated on the north end of the island. By 1972 the subpopulation had spread throughout the island (Urquhart 1973). Urquhart (1973) commented that an unusually heavy snowfall in the fall of 1970 had caused some caribou to leave Banks Island for the mainland, while others died from malnutrition. Hunters reported that many caribou died during that winter (cited in Gunn and Dragon 1998) and Urquhart (1973) extrapolated from 39 carcasses counted in June 1971 to estimate that 879 caribou died.

**Table 3. Area-corrected abundance and trend (3-generation [27y] and 2-generation [18y]) estimates for four Peary Caribou subpopulations. Complete survey data can be found in Appendix 1.**

| Subpopulation | Island (group) | Earliest survey within 3 generations | Earliest 3-gen area-corrected estimate | Earliest survey within 2 generations | Earliest 2-gen area-corrected estimate | Most recent survey | Most recent area-corrected estimate | Years of monitoring data (3-gen) | Approx. % 3-gen change | Years of monitoring data (2-gen) | Approx. % 2-gen change |
|---|---|---|---|---|---|---|---|---|---|---|---|
| BANKS-VICTORIA | Banks | 1987 | 4296 | 1998 | 454 | 2014 | 2248 | 27 | -47.67% | 16 | 395.15% |
| | NW Victoria | 1987 | 2790 | 1998 | 137 | 2015 | 4[2] | 28 | -99.86% | 17 | -97.08% |
| PRINCE-OF-WALES-SOMERSET BOOTHIA | Boothia | 1985 | 4738 | 1995 | 3265 | 2006 | 1[2] | 21 | -99.98% | 11 | -99.97% |
| | Prince of Wales | 1980 | 4212 | 1995 | 5[2] | 2004 | 1[2] | 24 | -99.98% | 9 | -80.00% |
| | Somerset | 1980 | 577 | 1995 | 115 | 2005 | 4[2] | 25 | -99.31% | 10 | -96.52% |
| | Russell | 1980 | 605 | 1995 | 0 | 2004 | 0 | 24 | -100.00% | 9 | |
| EASTERN QEI | Axel Heiberg | 1995 | 94[1] | 1995 | 94[1] | 2007 | 2255 | 12 | | 12 | 2298.94% |
| | Ellesmere | 1989 | 396[1] | 1995 | 149[1] | 2015 | 918 | 26 | 132.81% | 20 | 516.11% |

| Subpopulation | Island (group) | Earliest survey within 3 generations | Earliest 3-gen area-corrected estimate | Earliest survey within 2 generations | Earliest 2-gen area-corrected estimate | Most recent survey | Most recent area-corrected estimate | Years of monitoring data (3-gen) | Approx. % 3-gen change | Years of monitoring data (2-gen) | Approx. % 2-gen change |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Melville | 1987 | 955[1] | 1997 | 797 | 2012 | 2740 | 25 | 186.91% | 15 | 243.79% |
| | Prince Patrick | 1986 | 156[1] | 1997 | 87 | 2012 | 2746 | 26 | 1660.26% | 15 | 3056.32% |
| | Eglinton | 1986 | 79[1] | 1997 | 0 | 2012 | 181 | 26 | 129.11% | 15 | |
| | Emerald | 1986 | 14[1] | 1997 | 0 | 2012 | 45 | 26 | 221.43% | 15 | |
| | Byam-Martin | 1987 | 100[1] | 1997 | 0 | 2012 | 121 | 25 | 21.00% | 15 | |
| | McKenzie King | 1974 | 60[1] | 1997 | 36 | 1997 | 36 | 23 | | 0 | |
| | Borden | 1973 | 16[1] | 1973 | 16[1] | 1973 | 16 | 0 | | 0 | |
| WESTERN QEI | Brock | 1973 | 24[1] | 1997 | 0 | 1997 | 0 | 24 | | 0 | |
| | Devon | 2002 | 110[1] | 2002 | 110[1] | 2008 | 17 | 6 | -84.55% | 6 | -84.55% |
| | Lougheed | 1985 | 0 | 1997 | 103 | 2007 | 375 | 22 | | 10 | 264.08% |
| | Bathurst Is. Complex | 1988 | 1070[1] | 1997 | 81 | 2013 | 1463[1] | 25 | 36.73% | 16 | 1706.17% |
| | Cornwallis | 1988 | 52[1] | 2002 | 2 | 2013 | 4[2] | 25 | -92.31% | 11 | 100.00% |
| | Little Cornwallis | 1988 | 0 | 2002 | 0 | 2013 | 1[2] | 25 | | 11 | |
| | Helena | 1988 | 26[1] | 1997 | 0 | 2013 | 2[2] | 25 | | 16 | |
| OVERALL (approx.) | | | **21,637** | | **5,451** | | **13,178** | | **-35.31%** | | **141.75%** |

[1]Survey counts that include calves; [2]minimum counts.

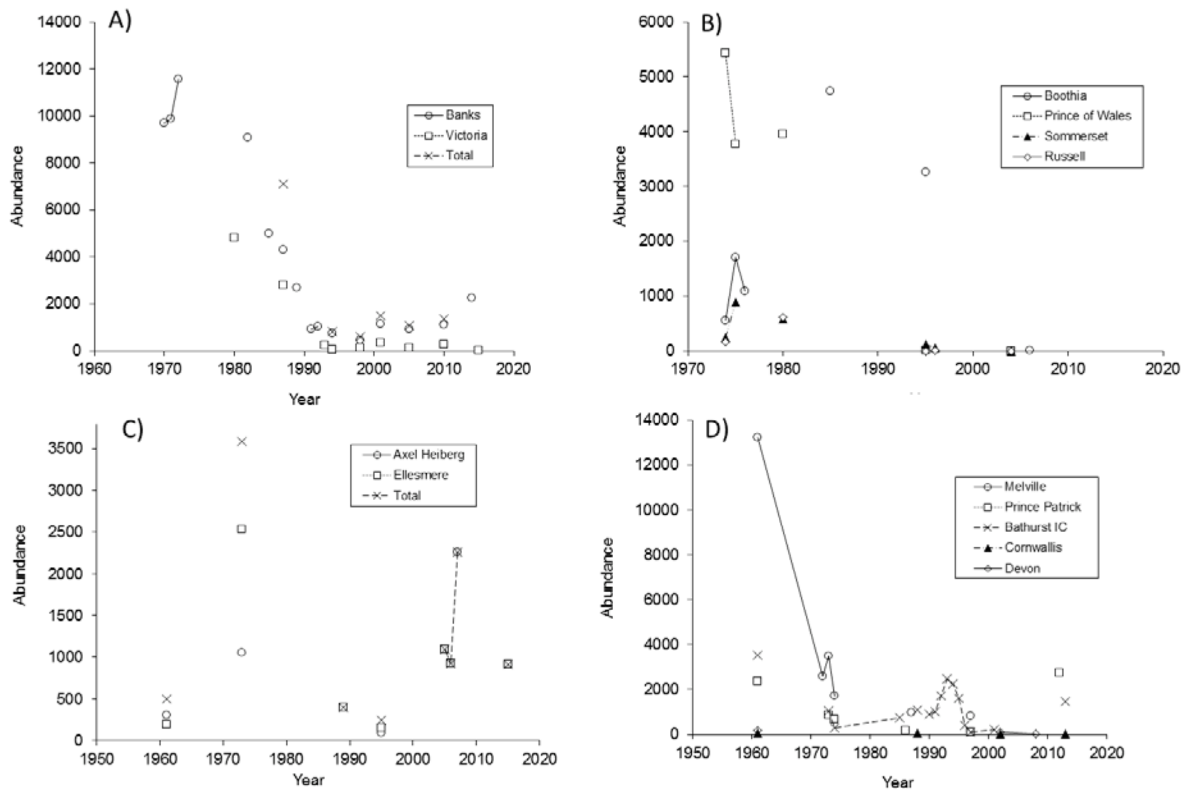



Figure 5. Abundance estimates from various island surveys for four Peary Caribou subpopulations: (A) Banks-Victoria; (B) Prince of Wales-Somerset-Boothia; (C) Eastern Queen Elizabeth Islands; (D) Western Queen Elizabeth Islands. Estimates are extrapolated from study areas to whole islands to aid in comparison across years and some earlier estimates (especially from WQEI) include calves. Totals were computed only when abundance estimates were available for each island in a group within a particular year. Standard errors are available for some surveys in Appendix 1. Figure produced by J. Bowman.

Available estimates from aerial surveys on Banks Island suggest steady declines from 1982 and relative stability at a low level from 1992 to 2010 (Gunn 2005; Davison and Williams 2013). The increase from 2,351 in 1959 (MacPherson 1960) to 12,098 in 1972 (Urquhart 1973) implies an average finite rate of increase (λ) of 1.14, or 14% per year. It declined more or less consistently, reaching a low of 451 ± CI 60 in 1998 (Nagy *et al*. 2013a). However, Nagy *et al*. (2006) suggested that the 1998 estimate was low for unspecified reasons. Abundance then increased to an estimated 1,142 ± CI 324 in 2001 (Nagy *et al*. 2006; a finite rate of increase of 30% for 3 years) and increased again to 2,234 in 2014 (Davison *et al*. 2014), the most recent estimate (Appendix 1).

The overall trend of Peary Caribou on northwestern Victoria appears more variable than Banks Island although survey frequency has been less. Historical information gathered for the Olokhaktomiut Community Conservation Plan (Anonymous 2008) related to northwestern Victoria Island stated that from 1900 to around 1920, Peary Caribou were increasing; however, a freezing rain event in about 1920 caused extensive mortality. Numbers fluctuated from then through the 1970s. Hunters from Ulukhaktok had difficulty finding Peary Caribou in the winters of 1991-1992 and 1992-1993 (Ulukhaktok, Wildlife Management Advisory Council (NWT), and Joint Secretariat 2008). Between 1980 and 1993, Peary Caribou from northwestern Victoria Island were surveyed five times, revealing a rapid decline from a high of 4,512 caribou in July-August 1980 (Jakimchuk and Carruthers 1980) to an estimated 159 in 1993 (Gunn 2005). A 2015 survey (April-May) recorded only one group of two individual Peary Caribou, while the most recent survey prior to that (July-August, 2010) yielded an estimate of 150 ± 104 adults. Reasons for the continued decline on northwestern Victoria Island are unknown, but are not thought to be related to disease and/or hunting (Davison and Williams 2013).

Prince of Wales-Somerset-Boothia

Current numbers of Peary Caribou in the Prince of Wales-Somerset-Boothia subpopulation are suspected to be close to zero at present, although the most recent survey was conducted almost 10 years ago. Surveys flown in 1980 and 1985 for this subpopulation yielded estimates of as many as 10,000 mature individuals, which plunged to a handful of individuals in the most recent surveys, suggesting close to 100% decline. Local hunters continue to observe occasional Peary Caribou or their tracks on the islands (Ekaluktutiak HTA 2013; Resolute Bay HTO 2013), but only at very low densities, and predicted a long slow recovery for the subpopulation (Campbell 2006).

An Inuk elder remembered his father saying that caribou were present in large numbers in the 1920s on Somerset Island and were hunted there until 1928–1930 when many caribou died; caribou persisted in small numbers there and on Prince of Wales Island until the late 1960s when they began to increase (Taylor 2005). Hunters from Taloyoak also reported that caribou numbers on Prince of Wales, Somerset, and Russell islands and Boothia Peninsula were low from the 1940s to the early 1970s and then increased (Gunn *et al*. 2006 and references therein). By the late 1970s there were "…lots of caribou, enough for winter clothing" on both islands (ATK in Taylor 2005).

The peak abundance recorded for Prince of Wales-Somerset islands was 5,682 total caribou in 1974 (Fischer and Duncan 1976), and 4,831 ± 543 on Boothia Peninsula in 1985 (Gunn and Ashevak 1990; Gunn and Dragon 1998). In the 1980s, during a period with high caribou numbers on Somerset Island and the small islands surrounding it, Inuit began seeing evidence of disease or parasites in caribou. Some caribou found dead had not died of old age or Wolf predation and caribou numbers began declining (ATK in Taylor 2005). The Resolute Bay hunters also said that by the early 1990s, the decline was so severe that they stopped hunting on Somerset and Prince of Wales islands. A 1995 survey, using the same methods and survey coverage as in 1980, found only 7 caribou on the three islands (Gunn and Dragon 1998). Because only two of those seen in 1995 were "on-transect", no quantitative estimate was possible. A non-systematic survey looking for caribou and tracks in April-May 1996 reported two caribou on Somerset Island (Miller, 1997). In 2004 no caribou were seen during aerial surveys of the islands, and only four were seen on Somerset Island by ground crews (Jenkins *et al.*, 2011). There have been no surveys conducted in the area since 2006, when Dumond (2006) spotted one caribou during a Muskox survey. Although tracks and individuals are spotted on occasion (Ekaluktutiak HTA 2013; Resolute HTO 2013), there is no evidence that numbers have recovered.

Gunn *et al.* (2006) examined factors explaining the near-total loss of Peary Caribou on Prince of Wales, Somerset, and Russell islands, and concluded that the decline from the mid-1980s to the mid-1990s resulted from long-term reduction in survival rates of calves and reproductive females associated with continued hunting and increased Wolf predation. Caribou declines in this subpopulation also coincided with an increase and range expansion of Muskoxen (Campbell 2006; Gunn *et al*. 2006), although there was no scientific evidence for or against deteriorating range condition. Miller *et al.* (2007a) put forward a combination of factors could limit population growth rates including Wolf predation, extreme weather, hunting, and disease.

Despite scientific uncertainty, the decline of Peary Caribou in the Prince of Wales-Somerset-Boothia subpopulation had been foretold: Simon Idlout recalled his father, Timothy Idlout, predicting in the early 1980s that the caribou would drastically decline, based on a die-off under similar conditions that the elder Idlout had observed in the 1920s (cited in Taylor 2005). Hunters in Gjoa Haven have reported that some caribou came from Prince of Wales Island to King William Island in the early or mid-1970s (J. Keanik pers. comm. cited by Gunn and Dragon 1998). Campbell (2006) also stated: "IQ indicates that the decline was a natural and predicted occurrence caused by the impacts of overabundance in the 1970s and early 1980s. According to IQ the major mechanism of the decline was emigration." Gunn *et al*. (2006) examined this factor, concluding that there was no known severe and prolonged environmental stimulus sufficient to cause so many caribou to abandon their ranges, nor was there any evidence of population increases on neighbouring islands to make up for these losses.

In 1974, 1975 and 1976, Thompson and Fischer (1980) estimated Peary Caribou on the Boothia Peninsula to number 561-626 (June and August surveys), 1,109-1,739 (March and June surveys), and 1,120 (a March survey), respectively; they interpreted the sudden increase from 1974 to 1975 as a large-scale immigration from Prince of Wales Island. They pointed out (citing Fischer and Duncan 1976) that Prince of Wales Island experienced a concurrent population decrease of similar magnitude, and suggested that because the Prince of Wales population did not increase in 1976, while the Boothia population stayed the same or increased that year, the large number of immigrants from Prince of Wales had stayed on Boothia. Gunn and Dragon (1998) estimated 6,658 ± 1,728 (SE) on the Boothia Peninsula in 1995, but did not distinguish between Peary and Barren-ground Caribou, although both types were seen. The migration of Peary Caribou from Somerset Island apparently stopped with their near-extirpation by the mid-1990s.

Western Queen Elizabeth Islands

Two Peary Caribou subpopulations are recognized in the QEI, with the majority of islands belonging to the WQEI (Table 1; Figure 1). Most of the largest islands were last surveyed in 2012 and 2013 (Anderson, 2014), together comprising almost half the total area of WQEI (179,648 $km^2$). Bathurst Island has received the most regular attention with ten estimates over a 41-year interval (Gunn and Poole, 2014). Surveys have recorded two die-offs and recoveries during this period. Miller and Barry (2009) examined population data during the 20 years between crashes on the southcentral QEI, where Peary Caribou experienced an average annual rate of increase of 13.2% from 1974 to 1994, which accelerated to 20.5% for the last six years from 1988 to 1994. Following the first crash, Miller *et al*. (1975) calculated subpopulation declines of 92% on Bathurst Island, 87% on Melville Island and 72% on Prince Patrick Island. Aerial surveys in spring 1975 confirmed that the decline continued (or a second decline occurred) during 1974–1975 (Gunn *et al*. 1981). Surveys confirmed another “catastrophic die-off” (or two, if individual years are counted) in the WQEI: in 1994–1995, when the south-central subpopulation (Bathurst and adjacent islands) crashed from 3,155 (based on another recalculation—Miller and Barry 2009) to 542 and again in 1996–1997 (Gunn and Dragon 2002), leaving only 78 caribou (no calves were seen) in the seven main islands of the subpopulation.

Some islands have received relatively little survey attention; the most recent survey in the Prime Minister Group was in 1997 (Mackenzie King, Brock) with Borden Island having been surveyed only in 1973 (Table 3; Appendix 1).

The most current combined population estimate (2012-2013) from Melville, Prince Patrick, Eglinton, Emerald, Byam-Martin, Bathurst Island complex, Cornwallis, Little Cornwallis, and Helena islands is about 7,300 adults. Surveys that were conducted in the same areas in 1986-1988 totalled 2,500 individuals (including calves). This implies a 232% increase in the overall population over the past three generations.

Miller and Barry (2009) asserted that the primary factor controlling Peary Caribou numbers on the QEI has been infrequent, isolated, stochastic weather events, namely exceptionally severe snow or ice conditions, causing reduced or failed reproduction, poor early calf survival, and/or high adult mortality. They found no evidence of range deterioration or limits to the abundance of aboveground annual plant production to suggest any direct density-dependent responses.

*Bathurst Island complex:* The earliest surveys (Tener 1963) estimated 3,509 individuals, including calves (recalculated by Miller *et al.* 2005) on the Bathurst Island complex in 1961. Subsequent surveys in 1973-1974 recorded precipitous declines, after which the population increased by ca. 4% per year over the first seven years after the crash (1974–75 to 1980–81; Miller and Barry 2009). By 1994, it had recovered to just about the same level as in the early 1960s (Appendix 1). Having suspended hunting after the 70s crash, hunters began returning to Bathurst Island in the late 1980s until another crash in mid-1990s that followed a fall rain/icing event, after which they again saw many carcasses of Peary Caribou and Muskoxen (ATK in Taylor 2005). Three successive single-year winter crashes from 1994–95 to 1996–97 resulted in a population of ca. 2–3% of its 1961 or 1994 size (Miller and Barry 2009; Appendix 1). Only two surveys have been conducted since that time, with the latest (2013) demonstrating an increase to 1,482 ± 387 (SE) individuals (including calves; Anderson, 2014).

As discussed in detail in COSEWIC (2004), available evidence clearly implicates density-independent weather events as the cause of both population crashes, with the chief cause of death being starvation as a result of prolonged snow or ice conditions hindering access to forage on a prolonged basis. Reproductive success and calf survival was poor during these periods; emigration was ruled out because of the number of carcasses. Resolute Bay elders recall similar die-offs in the 1930s (Resolute Bay HTO 2013).

Regarding recovery from population crashes, the infrequent nature of systematic surveys makes comparing and interpreting increases difficult, even in the relatively well-studied Bathurst Island complex. From 1975 to 1994, caribou on Bathurst and adjacent islands increased at an average finite rate of increase of about 13% per year ($\lambda$=1.13; Miller and Gunn 2003b), although from 1988 to 1993 it was 20% per year and from 1998 to 2001, after the mid-1990s die-offs, 36% per year. After 2001 through 2013 they grew at a more modest rate of $\lambda$ = 1.18, or 18% per year. High levels of annual reproduction, early calf survival, and low mortality among adults was evident from 1988 to 1994, when the population tripled in size and weather was favourable (Miller and Barry 2009).

Caribou appear never to have been numerous on Cornwallis Island and surrounding, smaller islands which are mostly calcareous rock with very little vegetation cover.

*Melville-Prince Patrick Group and Prime Minister Group*: While not nearly as frequently monitored as the Bathurst Island Group, the islands of the Melville-Prince Patrick group and the Prime Minister Group do not appear to have had as many or as severe die-offs. Surveys in 1973 (4,323 caribou) and 1974 (2,418 caribou) documented a decline or die-off previous to 1973 and a die-off during 1973–1974, based on carcass counts and low (almost zero) percentage of calves (Miller *et al*. 1975). However, the severity was "…dissimilar between islands and [was] most marked on north-western islands"; declines were also less severe than on Bathurst and adjacent islands (Miller *et al*. 1975:20).

Long-term trends for the Melville-Prince Patrick-Prime Minister Group of islands show a decline from the 1970s to 1997 (although Borden Island was not surveyed), and an increase to ca. 6,000 adults and yearlings reported by Davison and Williams (2012) for July 2012 (although the Prime Minister Group was not surveyed). The 2012 survey also documents re-colonization of formerly occupied islands.

The infrequent surveys may conceal abrupt population crashes, as in the winter of 1996–1997, when numerous caribou carcasses were observed (Gunn and Dragon 2002). Because the subpopulation estimates were similar in 1986–1987 compared to 1997 (see above), Gunn and Dragon (2002) suggested that this also implied an undocumented increase between 1987 and 1996.

Early explorers commented on the abundance of caribou and other wildlife in the two westernmost groups of islands (e.g., Parry 1821; M'Dougall 1857; Henessey cited in Bernier 1910; Stefansson 1921). In 1958–1959, MacPherson (1961) surveyed Emerald Isle, Eglinton Island, Melville and Prince Patrick islands, and the Prime Minister Group and estimated a total population of 6,898 (there were none on Brock or Eglinton islands). Tener's (1963) 1961 estimate was 12,799 total caribou for Melville Island, extrapolated from his counts of 769 caribou in 3 strata on Melville Island; he noted that they were distributed widely across the island, as opposed to the clumped coastal distribution he had seen on Bathurst Island. While admitting uncertainty in some assumptions in his calculations, Tener (1963:22) asserted that "…there is little doubt, however, that the total caribou population is in the thousands, far more than hitherto believed."

Miller (1987, 1988) surveyed Prince Patrick, Eglinton and Emerald islands in 1986 (181 ± SE 59 caribou) and Melville Island (943 ± SE 126) and Byam Martin Island (98 ± SE 37) in 1987; the combined estimates for the two years total 1,222 (Appendix 1). In 1997, Gunn and Dragon (2002) found 907 adult and yearling caribou on three islands: Melville Island (787 ± SE 97), Prince Patrick Island (84 ± SE 34), and Mackenzie King Island (36 ± SE 22), with no live caribou on Eglinton, Byam Martin, Emerald, or Brock islands. Borden Island was not surveyed. In summer 1997, dead caribou made up 43% of the 1+ year old caribou surveyed in summer 1997 on the WQEI, although mortality rates varied by island (30% for Melville Island, 84% for Bathurst, 22% for Lougheed, 40% for the Prime Minister Group; Gunn and Dragon 2002).

*Lougheed, Ringnes and Devon islands:* Tener's (1963) 1961 estimate was 566 caribou on the Amund Ringnes and Ellef Ringnes islands (13% calves), 269 on King Christian and Cornwall islands (30% calves), and 1,325 caribou on Lougheed Island (22.1% calves). Ground surveys by Stefansson (1921) estimated 300 caribou, which was also Macpherson's (1961) extrapolation from a geologist who counted 56 caribou from a high hill where he could observe about a quarter of the island. Resolute Bay hunters reported that Lougheed Island had "plenty of healthy caribou" in the early 1970s (Tony Manik in Taylor 2005). After the 1973–1974 crash, no caribou were documented (although surveys were infrequent) until Gunn and Dragon (2002) estimated 101 ± SE 73 adults and yearlings living on the island in 1997. Like the other island groups in WQEI, Lougheed was affected by the mid-1990s die-offs, with about 22% of the population represented by dead caribou in 1997 (Gunn and Dragon 2002). The most recent estimate was 372 ± CI 234 adults plus "short yearlings" on Lougheed Island and the four smaller islands extending south of it (collectively the Findlay Group) in 2007 (Jenkins *et al.* 2011). Caribou were only seen on Lougheed Island.

On western Devon Island, Jenkins *et al.* (2011) counted 35 caribou (no calves), mostly off transect in 2002, and gave a rough estimate of 40 caribou. In a more extensive survey (7,985 km) of all non-glaciated areas of Devon Island and small proximal islands in 2008, they found just 17 Peary Caribou.

<u>Eastern Queen Elizabeth Islands</u>

At 239,413 km$^2$, the EQEI occupy a larger area than WQEI and are made up of only two large remote islands: Ellesmere and Axel Heiberg. There have only been a few surveys since Tener (1963), with the most recent published accounts in 2005-2007 (Jenkins *et al.*, 2011) and 2015 for southern Ellesmere Island (Anderson and Kingsley 2015). Available information suggests that numbers have increased since the 1990s, but it is important to note that recent surveys have covered more areas than in the past (Table 3).

In 1961, Tener (1963), acknowledging uncertainty based on low coverage and other factors, gave "provisional" estimates of 300 (14% calves) on Axel Heiberg Island (which he characterized as an "intuitive guess") and 200 on Ellesmere Island (11% calves), the latter based on very low coverage, particularly in the north. Miller *et al.* (2005b), recalculated the 1961 estimates from Tener's original maps and field records, almost doubling the total number of Peary Caribou. Hendrigan (in MacPherson 1963) estimated 150 caribou on Axel Heiberg in 1960, more than half in the north from Cape Stallworthy to Nansen Sound, which is also where Tener recorded animals in 1961. Since that time, a few partial surveys were completed. For example, Riewe (1973) estimated 35 caribou around Skaare and Wolf fiords on southeast Axel Heiberg in 1973, Zoltai *et al*. (1981) saw no caribou in their study area on the east slopes of Axel Heiberg in 1980, while Gauthier (1996) reported a minimum count of 25 caribou in June 1995 on Axel Heiberg (Skaare Fiord to Mokka Fiord and west to Li Fiord). The island was not completely surveyed until 2007, with an estimate of 2,291 caribou of ≥1 year, mostly along the eastern slopes (Jenkins *et al*. 2011). However, reconnaissance flights in summer 2014 along eastern and southeastern Axel Heiberg only reported sightings of three bulls and a cow-calf pair at Skaare and Wolf fiords (M. Anderson, pers. comm. 2015). This island is too remote for hunters to access, with the most frequent access being researchers at Expedition Fiord who report seeing caribou occasionally in the limited ground they cover (M. Anderson, pers. comm. 2015).

Since Tener's survey on Ellesmere, several surveys have covered parts of the island, particularly in the south. Riewe (1973) estimated 150 caribou in 1973 on southern Ellesmere. Case and Ellsworth (1991) estimated 89 ± 31 (SE) caribou on southern Ellesmere Island. Gauthier (1996) counted 38 caribou on southern Ellesmere in June 1995. Southern Ellesmere was surveyed in 2005, along with Graham Island, with an estimate of 219 adults (109-442 95% CI). A survey was flown in March 2015 in the same area, with an estimate of 183 ± 128 (SE) indicating stability at a low density on southern Ellesmere Island (Anderson and Kingsley 2015). Central and northern Ellesmere were last flown in 2006, with an estimate of 802 adults (531-1207 95% CI) (Jenkins *et al*. 2011).

IQ emphasized the continued presence but general scarcity of caribou on southern Ellesmere Island until the early 2000s when they began to increase; Grise Fiord residents also reported fluctuations in numbers and more particularly in distribution, on southern Ellesmere Island (Taylor 2005). Peary Caribou have also been reported on Axel Heiberg Island by residents of Grise Fiord and Resolute when they (rarely) visit the island, and by the pilots and researchers working there in the spring and summer. The evidence could also suggest that caribou are re-colonizing areas that have been unoccupied for 15-25 years (Campbell 2006).

**Summary**

In light of the inconsistent surveys (different islands in different years, which may not accurately reflect subpopulations), large data gaps, and variable survey techniques and coverage, overall trends for Peary Caribou and each of its four subpopulations must be considered approximations and interpretations should be made with caution.

COSEWIC (2004) provided a rough total estimate of 50,000 Peary Caribou in the 1960s-70s when the first counts were made; in 1987, roughly three generations ago, the population was ca. 22,000 mature individuals (including some calves, especially from WQEI). Peary Caribou were at their overall lowest in 1996 at ca. 5,400 mature individuals (Table 3). The population estimate for the last COSEWIC assessment was 7,000 (COSEWIC 2004), while the current estimate is 13,700. In spite an increasing overall two-generation population trend of ca. 150%, the three-generation decline is just over 35% (Table 3).

WQEI experienced profound declines in the mid-1990s, related to icing events, whereas declines of both the Banks-Victoria and Prince of Wales-Somerset-Boothia subpopulations commenced almost a decade earlier and took place more gradually and for reasons that are less understood. One subpopulation (POW-Somerset-Boothia), which comprised almost half (10,000 mature individuals) of the estimated Peary Caribou population in 1987, has shown no signs of recovery. Banks-Victoria numbers have been increasing in the past decade, but not on Victoria Island. The WQEI subpopulation has increased overall since the mid-1990s, but with some fluctuations. EQEI numbers appear to be increasing as well, although baseline numbers are highly uncertain (Table 3).

Peary Caribou does not meet the IUCN definition of “extreme fluctuations” (IUCN 2014) because the magnitude of the population changes has been less than 10-fold, they are not synchronous for the four subpopulations, and are more reflective of population reductions (followed by some recovery) in response to threatening processes, rather than naturally recurring patterns of increases and decreases. However, ATK does indicate a tendency for population numbers to fluctuate over time over the past century (Ekaluktutiak HTA 2013; Resolute Bay HTO 2013; Sachs Harbour HTC 2013; Spence Bay HTO 2013), and many island surveys indicate considerable variability around the mean (Appendix 1).

### Rescue Effect

The only potential source for rescue of Peary Caribou from outside Canada would have been from northwestern Greenland at one time, but there is little evidence of a present-day extant population (see **Global Range**).

## THREATS AND LIMITING FACTORS

Direct threats facing Peary Caribou assessed in this report were organized and evaluated based on the IUCN-CMP (World Conservation Union-Conservation Measures Partnership) unified threats classification system (Master *et al.* 2009). Threats are defined as the proximate activities or processes that directly and negatively affect the Peary Caribou population. Results on the impact, scope, severity, and timing of threats are presented in tabular form in Appendix 2. The overall calculated and assigned threat impact is Very High-Medium for Peary Caribou. This wide range rank of threat impacts is due to the combined effect of the high number of mostly low-impact threats, and the considerable uncertainty, unpredictability, and potential overlap and interaction of individual threats.

Narrative descriptions of the threats are provided below in the general order of highest to lowest overall impact threats.

## High-Medium Impact

Climate Change and Severe Weather (IUCN Threat #11)

The highest-impact threat to Peary Caribou arises from the myriad effects of a changing climate. Climate change has already affected the Arctic, and is occurring at higher rates than in other global ecosystems (ENR 2011; IPPC 2013; Stern and Gaden 2015). Measurable signs of a warmer Arctic and observed and predicted ecological consequences are commonly reported (Hinzman *et al.* 2005; Lim *et al.* 2008; Post *et al*., 2013). Inuit of the Kitikmeot region reported for the mainland a variety of changes, including longer summers, unusual freeze-thaw cycles in the spring, earlier spring break-up and open sea-ice, later fall freeze-up, thinner ice (both lakes and sea-ice), lower water levels, and less snowfall (Golder Associates Ltd. 2003). For the Arctic islands, community representatives reported effects similar to those in the Kitikmeot region, plus icebergs having disappeared north of King William Island, the extent of multi-year ice reduced, harder and rougher snowpack, and altered prevailing wind direction and causing altered orientation of snowdrifts (Golder Associates Ltd. 2003 and sources therein).

For Peary Caribou, changes in three Arctic climate (abiotic) variables – temperature, precipitation and severe weather events – account for most population-level effects of climate change (reviewed in Johnson *et al*. in prep.). This leads to both negative and positive changes in forage accessibility and decreased extent and thickness of sea ice. The primary population-level impacts range from shifts in migration and movement patterns to periodic mortality events, including population crashes. Climate change may also have a positive effect through extension of the growing season and increases in forage biomass. The accessibility of caribou to hunters will also be influenced by ice conditions and snow cover.

*Habitat Shifting and Alteration (#11.1)*

Annual average temperatures have increased across the Canadian Arctic from 1950 to 2007, with implications for the timing and amount of plant growth and diversity (Zhang *et al.* 2011). Arctic surface air temperatures since 2005 have been higher than for any five-year period since first measured in the 1880s, and evidence from lake sediments, tree rings, and ice cores suggest that recent summer temperatures have been higher than at any time in the past 2,000 years (AMAP 2012). Other documented changes include higher inflows of warm water entering the Arctic Ocean from the Pacific, declines in the extent and duration of snow cover, with the Arctic land area covered by snow in early summer reduced by 18% since 1966, and Arctic sea-ice decline at a rate that has been faster during the past ten years than averaged over the previous 20 years. Sea-ice thickness is also decreasing and sea-ice cover is increasingly dominated by younger, thinner ice (AMAP 2012).

Future temperatures in the Arctic are difficult to model because of uncertainties regarding extent of snow cover and retreat of sea ice, which are already accelerating much faster than previously predicted (see below). Nevertheless, experts agree that by 2100, mean projections for Arctic winter air temperatures under various $CO_2$ concentration scenarios will be an increase of 2–9 °C above the 1986–2005 average; the highest projections range up to about 15 °C above the 1986–2005 average (IPCC 2013b). By 2035, Christensen *et al*. (2013) predicted mean annual surface temperature in the Arctic to rise by 1.5°C, with mean winter (December to February) temperature expected to increase more than mean summer (June-August) temperature (+1.7°C winter vs. 1°C summer). Mean projections for sea surface temperatures will be an increase from 4 to 14 °C under reasonably foreseeable $CO_2$ concentration scenarios, with estimates for the highest $CO_2$ concentration scenario at about 23 °C above the 1986–2005 average (IPPC 2013).

From 1951 to 2008, mean annual precipitation increased by 0.63-5.83 mm/yr/decade across the Arctic (IPCC 2013). Records from NWT climate stations indicate an increase in snowfall by 20-40% in the Arctic tundra (GNWT 2014). Mean annual precipitation is projected to further increase by 6% in 2035, more in winter than summer (Christensen *et al*. 2013).

This threat category is made up of three principal components: terrestrial habitat changes, sea ice loss, and sea level rise. Collectively, these are expected to affect most if not all of Peary Caribou range, with overall impact ranging from moderate to serious, depending on many competing factors.

Terrestrial habitat changes:

Temperature increases (and other climate changes such as increased $CO_2$) have increased plant biomass. Ahern (2010) used analysis of the satellite-sensed normalized-difference vegetation index (NDVI) to show that plant growth has increased in southern and western parts of the range of Peary Caribou over the past 30 years. In short, “the Arctic is getting greener and primary productivity is increasing” (Eamer *et al*. 2013). These changes include plants leafing out and blooming earlier, which correlates with the general warming over the same time period (Oberbauer *et al*. 2013). With greening due primarily to increased shrub biomass (especially evergreen shrubs), however, the extent to which it will improve habitat or forage, and be of sufficient nutritional content for Peary Caribou is unknown. A spatially explicit modelling effort by Tews *et al.* (2007a) concluded that under scenarios where the frequency of extreme weather events did not change during this century, a projected 50% increase in biomass might alleviate the severity of population die-offs during disturbance years. However, when forage inaccessibility in poor winters increased by more than 30% over the same time period, as might be expected if the frequency and severity of disturbance events increases (as has been predicted to be a result of climate change; Larsen *et al*. 2014), models suggested net negative effects for Peary Caribou population dynamics.

Several authors have suggested that a phenological mismatch could threaten Peary Caribou if climate change were to alter the current synchrony between calving and lactation on one hand, and plant greening and blooming on the other (Festa-Bianchet *et al*. 2011; Gunn 1995, 1998; Gunn and Skogland 1997; Oberbauer *et al*. 2013; Parks Canada 2010; Tews *et al*. 2007b). This may have already occurred in other Arctic caribou ranges: in West Greenland, advancement of the plant-growing season during a period of temperature increase led to increased calf mortality, and a fourfold drop in calf recruitment over about a ten-year period (Kerby and Post 2013; Post and Forchhammer 2008).

Sea ice loss:

Sea ice decline is occurring at a faster pace than predicted by earlier modelling efforts (Overland and Wang 2013). In 2012, seasonal ice shrank to its lowest extent ever, continuing a trend that accelerated after 2000. The 2012 extent was about half that of the average summertime extent from 1979 to 2000, while the maximum winter extent was the fifth lowest in the past 35 years (Vinas 2013). September sea ice extent could shrink another 43%–94% by 2100; “a nearly ice-free Arctic Ocean in September before mid-century is likely” for the highest $CO_2$ emission scenario (IPCC 2013). The extent of Arctic perennial and multi-year sea ice decreased between 1979 and 2012 and the thickness of average winter sea ice within the Arctic Basin decreased by between 1.3 and 2.3 m between 1980 and 2008 (IPCC 2013). Relevant to Peary Caribou sea ice crossings (Figure 2), declines of total sea-ice concentration that occurred from 2001-2010 were 50% for the M’Clintock Channel and 38% for the Eastern Arctic Channel (Stern and Gaden 2015). A general trend is for freeze-up to be occurring later and thawing events to happen more frequently during winter today than in the past (Ekaluktituiak HTA 2013).

The extent to which loss of sea ice could interrupt the inter-island migrations and other movements in parts of the range of Peary Caribou with population-level impacts is unknown. Hunters reported drowning events in the 1950s of Peary Caribou crossing between islands, and some suspected such events to be responsible for local declines (William Kagyut in Elias 1993; Kassam 2009). The nature of the impact to Peary Caribou populations would relate to the timing of the sea-ice freeze up in fall and break up in summer. This can affect migration patterns and the ability of individuals to move from island to island safely on time. Higher mortality rates can result from drownings that occur when animals fall through the ice as they seek to reach more suitable winter foraging areas. Because multi-island range rotation is known to enable recovery and growth of forage plants on summer ranges (Miller *et al*. 2005b; Resolute Bay HTO 2013), if Peary Caribou are forced to remain on any one island, there may be consequences to forage quality and nutritional state of stranded animals.

Sea level rise:

Sea level has risen about 0.19 m in the last 110 years (IPCC 2013). In the next 90 years, sea level is likely to rise further between 0.26 to 0.82 m (IPCC 2013). Such an increase could inundate large areas of Prince of Wales Island, Prince Patrick Island and islands in the Prime Minister and Ringnes groups (Pelletier and Medioli 2014) where isostatic rebound does not counter sea level rise.

*Storms and Flooding (11.4)*

Several high-mortality incidences following severe weather events have been recorded over the past four decades. Peary Caribou die-offs in the WQEI were linked to unusually warm weather in early winter, which caused the upper few centimetres of snow to melt and then subsequently freeze solid, preventing access to forage (COSEWIC 2004 and others). This resulted in 46% (1973-74) and 30% (1996-97) mortality in one winter, and >90% when there were three successive years of severe weather. An event such as this tends to occur as an ice crust on top of the snow, or the melted snow, percolates through the snowpack and refreezes at depth or on contact with the ground. In support of this, IQ reported up to 5 cm of ice in some years (Jenkins *et al*. 2010a;b; Taylor 2005). Similar ATK observations on Banks Island were reported: "in the fall, we get freeze-up on the whole island. Then, before the snow is really deep, we get our mild weather and rain. Then it's cold enough for the rain to freeze on top the snow and that's when the caribou try to leave the island, even go out into the ocean…. they were eating mostly ice" (Frank Carpenter quoted in Nagy 1999:163).

How much of a threat climate change may be to Peary Caribou will depend on the frequency and severity of icing (rain-on-snow and melt-freeze) events. Although severe weather events are predicted to increase in frequency and severity, there is considerable uncertainty with respect to location and timing of such events, and the consequent effects on population dynamics within the next three generations. There have been many reports that the frequency of rain-on-snow icing events have increased within Peary Caribou range (Festa-Bianchet *et al*. 2011; Gunn 1998; Gunn and Skogland 1997; Harding 2004; Miller and Gunn 2003a; Sharma *et al*. 2009; Tews *et al*. 2007b, 2012; Vors and Boyce 2009), and are predicted to continue increasing into the future (Hansen *et al.* 2011; IPCC 2013). Erratic weather is linked to the prevalence of freezing rain, and indications are that stochastic weather events are becoming more common on Banks Island due to climate change (Riedlinger 2001).

Miller and Barry (2009) argued that major population declines in Peary Caribou have followed severe winter weather due to forage inaccessibility bringing about starvation, and Arctic community members also consider this to be a major threat to Peary Caribou (Resolute Bay HTO 2013; Sachs Harbour HTC 2013; Spence Bay HTO 2013). The negative effects of severe weather events such as icing on populations appear to be predominantly through increased mortality from reduced forage in winter ("locked pastures"; Hansen *et al.* 2011) or reduced production of calves (Miller *et al.*, 1977; Miller, 1991a; Gunn and Dragon, 2002; Miller and Gunn, 2003; Tews *et al.*, 2007b). Contrastingly, Tyler (2010) argued that the effect of above-zero temperatures when snow is on the ground depends on snow depth: while warm weather may cause melting and a hard crust in deep snow, in shallow snow it could improve forage availability by melting the snow and baring the foliage.

**Medium - Low Impact**

<u>Pathogens (IUCN Threat # 8.1 [Invasive non-native alien species])</u>

The potential role of disease in Peary Caribou population dynamics is not well understood. ATK on Prince of Wales-Somerset indicated that increased observations of disease were accompanied by population declines in the 1980s (ATK in Taylor 2005). The literature on disease in Peary Caribou is sparse, thus potential issues are extrapolated from what is known in other caribou ecotypes and Muskoxen.

Known pathogens of potential concern that have impacts on reproductive success or survival in caribou include *Brucella suis* biovar 4, *Erysipelothrix rhusiopathiae,* Cervid herpes virus, parapox virus, *Neospora, Besnoitia,* and gastrointestinal parasites*.* Of these, the most important threats may be *Brucella and Erysipelothrix.*

*Brucella suis* biovar 4 is a bacterium that can cause arthritis, bursitis, and infertility. It has been associated with substantial population decline of the Southampton caribou since 2000 (Campbell, 2013). *Brucella* has not previously been reported in Peary Caribou and a serological survey on Banks Island in 1993-94 did not detect antibodies to this disease (e.g., serum samples were negative for brucellosis—Larter *et al*. 1996). However, clinical cases were detected in Muskoxen on Victoria Island near Minto Inlet and Ekalluk River between 1996-1998 (B. Elkin pers. comm. 2015), and more recently (2014) in a sport-hunted Muskox near Cambridge Bay (M. Tomaselli pers. comm. 2015). The bacteria is well known in mainland Barren-ground Caribou with fluctuating prevalence (Leighton 2011; Curry 2012), and was reported as an emerging disease issue in the 1980s by hunters near Taloyoak, Kugaaruk, and Gjoa Haven, Nunavut, but presumably from Barren-ground Caribou (Gunn *et al*., 1991). There is no reason to think that this bacterium will not, if it has not already, invade Peary Caribou populations. The population-level impacts will depend on transmission dynamics; low densities of Peary Caribou may limit spread.

*Erysipelothrix rhusiopathiae* is a bacterium recently identified as a significant cause of widespread mortality in Muskoxen on Banks and Victoria islands, and likely at least in part responsible for the observed declines approaching 70% on Banks Island since 2010 (Kutz *et al*., 2013). This is a generalist and opportunistic pathogen, and is often found infecting domestic animals that are considered ‘stressed’. In Muskoxen and caribou it can cause sudden death, and in Muskoxen this is of all age classes. Several Barren-ground Caribou herds have tested positive for exposure to this bacterium (S. Kutz pers. comm. 2015) and it was considered the cause of death for Mountain Caribou in British Columbia (Forde 2015). While there remain many uncertainties about the origin and ecology of this bacterium in the Arctic, early data suggest that it should be considered a pathogen of interest for all arctic ungulates, including Peary Caribou (Forde 2015).

In general, under current climate warming scenarios, range expansion of several other pathogens is anticipated, and has already occurred for at least one parasite, the lungworm, *Varestrongylus eleguneniensis (*Kutz *et al.*, 2013). In 2010 this parasite, which affects both caribou and Muskoxen, was detected for the first time on Victoria Island. It was probably introduced by the migrations of the Dolphin and Union caribou, and sporadic movement of Muskoxen to the island from the mainland. The recently permissive climatic conditions appear to have allowed this parasite to now be maintained, and expand its geographic range as far north as Surrey River area (P. Kafle pers. comm. 2015). The parasite requires slug or snail intermediate hosts, so its distribution may be limited by the abundance of these hosts. However, a related lungworm of Muskoxen has also expanded its range onto the island and occurs near Ulukhaktok; thus further range expansion of the lungworm into Peary Caribou range is anticipated. Although *V. eleguneniensis* is not considered to be particularly pathogenic, this recent range expansion highlights that climate change is already driving changes in distribution and abundance of pathogens of caribou.

Climate warming may also act by increasing susceptibility of caribou to infectious disease and insect harassment. Inuit have confirmed that hot weather can cause caribou to lose body condition and they have noted an increase in deaths from heat-related and insect-induced exhaustion that they attributed to climate change (ATK in Dumond 2007; Thorpe *et al*. 2001).

Summer weather influences the activity of warble flies. There has been an increase in suitable weather and a longer fly season from 1957–2009 on Barren-ground Caribou ranges (Gunn *et al*. 2011 and references therein). Warble flies are considerably less common on the High Arctic islands (e.g., 97% to 100% of Beverly herd caribou had warbles, but only 14% of Peary Caribou; Thomas and Kiliaan 1990), but the adult fly as the infective stage could be prolonged with warmer summers their prevalence could increase with continued global warming.

On the other hand, warmer temperatures may not favour all parasites, i.e., gastro-intestinal worms (Hoar *et al*. 2012). A warmer climate will not only affect the existing parasites and diseases but also increase the likelihood of invasive species (Kutz 2007; Davidson *et al.* 2011).

<u>Shipping Lanes (IUCN Threat # 4.3)</u>

The projected decline of sea ice extent increases the possibility of year-round shipping routes within the Canadian Arctic Archipelago, particularly the opening of the Northwest Passage (NWP). It is assumed that increasingly lighter ice conditions will allow the navigation season to lengthen and shipping traffic to increase. In 1990-2011 shipping increased by 75%, reaching a maximum of 19 transits in 2010 (NORDREG in ENR 2011, updated to 2012 by SARC 2012), with some large icebreakers taking the northern route between Melville and Banks islands (McClure Strait: 6 times from 1993-2011; SARC 2012). Passages of cruise ships have already increased more than threefold between 1993 and 2007 (Judson, 2010, cited in Gunn *et al*. 2011). Shipping traffic experienced a 75% increase in Canadian Arctic waters from 1990 to 2012, while extent of sea ice declined, and is expected to increase further. Increased icebreaker-supported shipping would exacerbate the climate-induced effect of thinner ice and more lengthy ice-free periods (Gunn *et al*. 2011; Poole *et al*. 2010).

Shipping as a potential threat is a consideration for Peary Caribou due to seasonal migrations between islands (Paulatuk HTC 2013; Resolute Bay HTO 2013). In addition to potential population consequences of changes to ice thickness (discussed above), opening of shipping channels during winter would curtail certain island crossings altogether. The severity of impact to the overall population will depend on which island crossings are affected, how consistently across years, and the sizes of the populations. Shipping channels (Figure 6) could open between Prince of Wales and Somerset islands (Prince of Wales-Somerset and QEI-Prince of Wales crossings) and Bathurst-Cornwallis, but are less likely to affect Ellesmere, Axel Heiberg, or the Ringnes group, all of which are largely in pack ice (Figure 3) and not on any trade route.

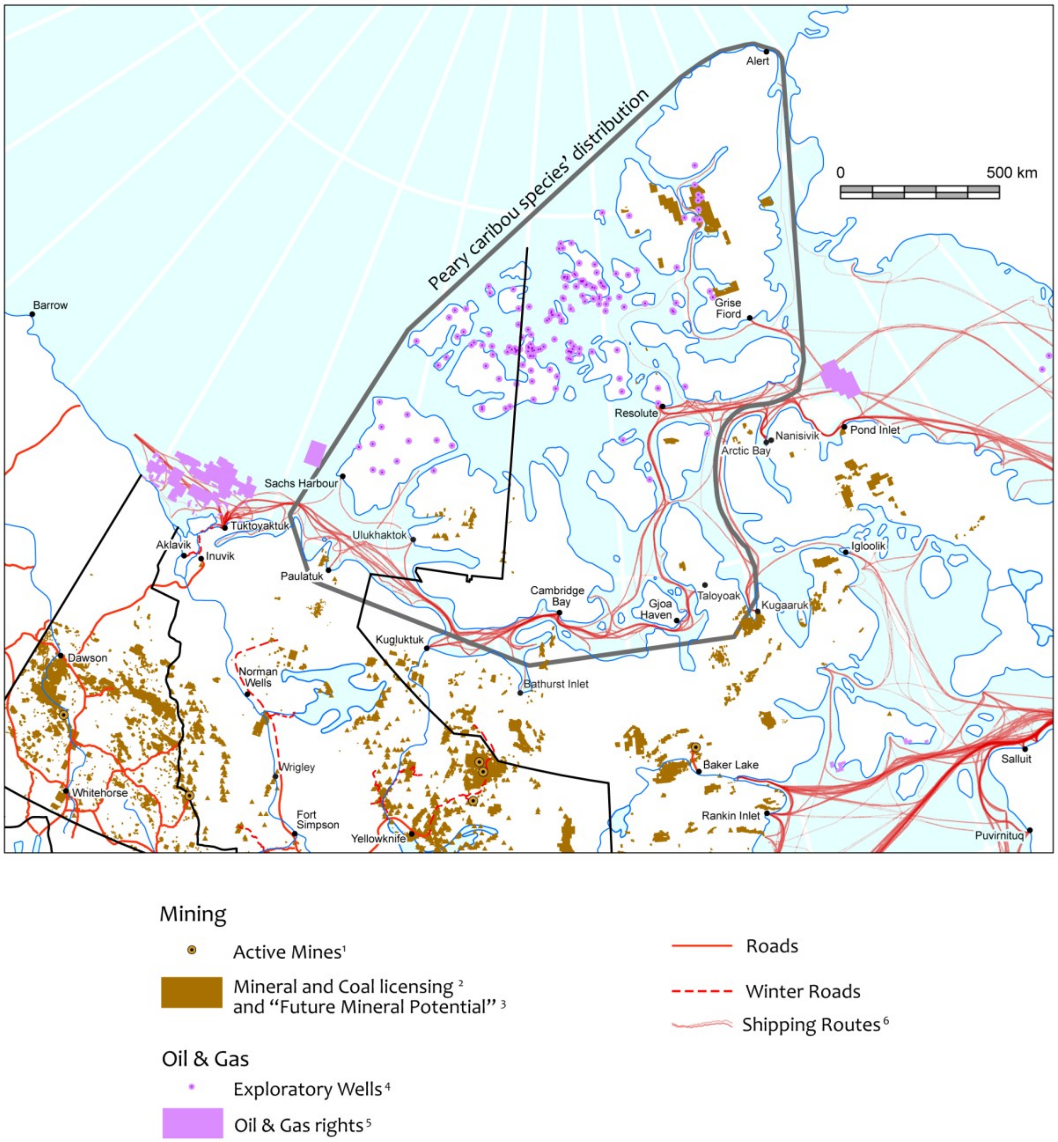
Mine and energy exploration and development (discussed below; Figure 6) could also precipitate increases in shipping traffic in the region. Overall, shipping traffic is expected to increase in the Canadian Arctic Archipelago in the near future.

**Low Impact**

<u>Hunting (IUCN Threat # 5.1)</u>

Modern Inuit and the cultures that preceded them, including the Thule from whom Inuit are descended, and the unrelated Dorset and pre-Dorset cultures have been hunting caribou in the region for at least 4,000 years (Fitzhugh 1976; Friesen 2013; Howse 2008; Manseau *et al*. 2005; Meldgaard 1960). Large-scale hunting and purchase of caribou meat by European explorers, and their introduction of firearms to Inuit (e.g., by Peary in the 1890s; Roby *et al*. 1984), caused or accelerated some declines, for example on Ellesmere Island (Petersen *et al*. 2010).

Much of Peary Caribou range is too inaccessible from settlements for resident hunters to reach by snow machine. There are no settled communities in the Melville-Prince Patrick group, Prime Minister Group, Ringnes group, Axel Heiberg Island or northern Ellesmere Island (with the exception of the Alert military base). Mould Bay (Prince Patrick Island) and Isachsen (Ellef Ringnes Island) weather stations are currently uninhabited. Therefore, modern-day Peary Caribou hunting takes place in areas accessible from settlements in and adjacent to the population's range.




1. Active Mines:
Canada Northern Economic Development Agency (http://www.cannor.gc.ca/DAM/DAM-CANNOR-CANNOR/STAGING/texte-text/nat_res_dev_project_map_1380647429535_eng.pdf) [accessed 15 Dec 2015]

2. Mineral and Coal licensing:
Geomatics Yukon, Government of Yukon (http://mapservices.gov.yk.ca/GeoYukon) [accessed 15 Dec 2015]
Aboriginal Affairs and Northern Development Canada (http://nwt-tno.inac-ainc.gc.ca/ism-sid/minftp_e.asp) [accessed 15 Dec 2015]

3. Future Mineral Potential:
Yukon Government, Energy, Mines and Resources (http://www.emr.gov.yk.ca/mining/pdf/yukon_exploration_projects_december_2012_13x17.pdf) [accessed 15 Dec 2015]
Northwest Territories Geological Survey, NORMIN database (http://ntgodata.nwtgeoscience.ca) [accessed 15 Dec 2015]
NunavutGeoscience.ca, Mineral Exploration Overview Magazine 2012.pdf (http://www.nunavutgeoscience.ca/eo/index_e.html) [accessed 15 Dec 2015]

4. Oil & Gas, Exploratory Wells:
Natural Resources Canada, BASIN Database (http://basin.gdr.nrcan.gc.ca/index_e.php) [accessed 15 Dec 2015]

5. Oil & Gas rights:
Aboriginal Affairs and Northern Development Canada, Oil and Gas Rights Digital Files (https://www.aadnc-aandc.gc.ca/eng/1100100036298/1100100036301) [accessed 15 Dec 2015]

6. Shipping routes:
Generalized from Canadian Arctic Shipping Routes for 2010, Transport Canada Special Projects and Arctic Shipping 2011, Transport Canada

Figure 6. Resource development potential (including roads and shipping lanes) in the Canadian Arctic. Map made by Andrew Murray (Environment and Climate Change Canada, Landscape Science Division).

Beneficiaries of the Nunavut Land Claim Agreement (NLCA), i.e. Inuit, are not restricted through legislation from hunting caribou, unless a conservation issue arises that results in establishing a total allowable harvest (TAH); absent a TAH, there is no reporting requirement. Specifically, Section 5 of the NLCA states: "Where a total allowable harvest for a stock or population of wildlife has not been established by the NWMB…an Inuk shall have the right to harvest that stock or population in the Nunavut Settlement Area up to the full level of his or her economic, social, and cultural needs, subject to the terms of this Article." The parallel situation also pertains to the Inuvialuit Final Agreement.

An absence of hunting limits and mandatory reporting means that hunting records are not kept consistently, which prevents quantitative analysis or enumeration of trends. In addition, even when hunting levels are monitored, effort is unrecorded, adding to the difficulty of determining when hunting reaches unsustainable levels. Other evidence does suggest, however, that current offtake rates are low where hunting occurs within Peary Caribou range. A compilation of voluntary reporting of Peary Caribou hunt in Nunavut during the last decade showed about 10-36 animals per year hunted by residents from Resolute Bay (mostly on Bathurst Island), and another 10-60 hunted by residents of Grise Fiord on Ellesmere and Devon islands (Government of Nunavut 2011). Annual harvests during the last decade for the Northwest Territories were reported as 12 or fewer on Banks Island, and 0 from both WQEI and Minto Inlet (Gissing and Fleck 2011).

There is a history of voluntarily curtailing of hunting of Peary Caribou by Inuit and Inuvialuit hunters, through their local associations, when caribou populations were known to be at low levels (Ferguson 1987; Ferguson *et al*. 2001; Larter and Nagy 1995, 2000a; Miller and Gunn 1978; Taylor 2005). For example, from 1974 to 1989, the Resolute Bay Hunters and Trappers Association (HTA) prohibited Peary Caribou hunting on Bathurst Island. In 1982, upon noticing Bathurst Island caribou moving to Cornwallis Island, the ban was extended to include that island as well. From 1989 to 1996, as the population increased, the HTA allowed limited hunt in consultation with government biologists. After the 1995-1997 die-off, however, the hunt was halted again. Similarly, Inuit hunters from Grise Fiord instituted a 10-year moratorium on caribou hunting on most of southern Ellesmere Island from 1986 to 1996 while caribou numbers were low. There are currently no harvest limits imposed on NLCA beneficiaries hunting Peary Caribou in Nunavut.

Hunting may have been a factor in the declining trend of Peary Caribou on northwestern Victoria Island (Gunn *et al*. 1998). In response to the decline, the Olokhaktomiut Hunters and Trappers Committee initiated a zero-harvest by-law that is now enforced by GNWT legislation (Gunn 2005). Approximately 300-450 caribou (mostly females) were hunted annually on Banks Island in the 1970s and 1980s, skewing the subpopulation towards males and younger animals (Larter and Nagy 2000a). Despite action by Sachs Harbor to institute a voluntary quota in 1990 for Banks Island, the caribou subpopulation continued to decline. The voluntary quota is still in place (GNWT 2011 cited by SARC 2012); surveys since 1998 have shown an increasing trend (see **Fluctuations and Trends**). SARC (2012) reports a harvest rate on Banks Island of 1-3% since the mid-2000s. Miller *et al.* al. (2007 a and c) rationalized from estimated harvest rates and abundance how hunting on the Boothia Peninsula may have contributed to the 98% decline (1980-1995) of the Prince of Wales-Somerset subpopulation (see **Fluctuations and Trends**).

In summary, there is a history of cooperation between local community associations and biologists to implement community-based management in recognition of potential population-level impacts of hunting of Peary Caribou under certain conditions. Accordingly, current hunting rates of Inuit and Inuvialuit communities situated within Peary Caribou range appear to be low relative to before the 1990s. However, inconsistently collected hunting statistics, insufficiently-frequent population surveys and limited demographic sampling to quantify recruitment, age-specific mortality and fecundity collectively provide substantial uncertainty in population trends, hunting levels, and their interaction. The continued success of community harvest management as a dynamic component of Peary Caribou conservation will rely on both adequate monitoring and the ability to account for shifting trends, which include the steep declines of Baffin Island caribou and several mainland Barren-ground herds as well as Banks and Victoria Island Muskoxen (Kutz *et al*., 2015), the increasing demand for caribou from rapidly growing human populations, and a rising interest in country food and potential commercial harvest implications.

Competition and Predation (IUCN Threat #8.2: Problematic native species)

Possible multi-prey (especially Muskoxen) and Wolf interactions were noted earlier (**see Interspecific Interactions**). Although the impact of Wolf predation on Peary Caribou population dynamics is unknown, many authors consider it likely to be a major threat to recovery when population sizes are low (Nagy *et al*. 1996; Gunn *et al*. 2000b; SARC 2012). How such interactions might change with a warming and greening environment adds a new dimension to the question, which is why they are considered a threat (albeit) low in this status report, rather than a limiting factor.

Energy Production and Mining (IUCN Threat #3)

Industrial activities are currently restricted, with market prices being an important determinant of the extent and intensity of activity at any given time. Mineral exploration, particularly for coal on Ellesmere Island, is currently occurring within Peary Caribou range (CWS 2013; 2014; 2015), but there is little current seismic activity or oil and gas development occurring in the range at large (Figure 6).

The most active period for oil and gas exploration in Peary Caribou range was in the 1960s and 1970s, when it was widespread on Banks, Melville and Prince Patrick islands (Usher 1971; Miller *et al.* 1977a). Polaris mine − located on Little Cornwallis Island from 1980-2002 − was the one mine (Zn-Pb) that has been operational in Peary Caribou range. A surge in oil-related exploration and other factors in the 1960s led to the initial discovery and exploration of the deposit; logistic support through the mine's operation offered opportunities for continued exploration until the closure of the mine in September 2002 (Dewing *et al.* 2006). Mineral exploration took place in the Shaler Mountains of northwest Victoria Island in the 1990s, but this has not led to any development (SARC 2012). The known potential for oil and gas as well as minerals exists throughout Peary Caribou range, and exploratory wells have been drilled all over the WQEI and Banks Island (Figure 6). High-grade thermal coal deposits, with the potential for metallurgical coal, at or near the surface on Axel Heiberg and central Ellesmere islands have previously been proposed for development by West Star Resources, and more recently by Canada Coal, the company which owns the licences on the Fosheim Peninsula, although they withdrew their application from the Nunavut Impact Review Board pending more consultation in 2013. Boundaries for the recently gazetted Qausuittuq National Park on northern Bathurst Island reflect the recommendations of the Senior Mineral Energy & Resource Assessment Committee, which rated high potential for lead zinc mineralization on the northeast coast of Bathurst Island, and petroleum potential on southwest Cameron Island, and therefore excluded this island from within the park boundaries in spite of its known importance for caribou (Resolute Bay HTO 2013; Poole *et al*. 2015).

ATK concerns about strong negative influence of industrial activities on Peary Caribou include 1) direct, negative effects on animal health from smoke and dust from seismic explosions and fuel or rust leaking from oil drums (Taylor 2005; Ivig HTA 2013; Resolute Bay HTO 2013; Sachs Harbour HTC 2013); 2) avoidance behaviour due to sensory disturbance (Taylor 2005; CWS 2013; Ivig HTA 2013; Resolute Bay HTO 2013) or barriers to movement (Urquhart 1973; Slaney and Co., Ltd. 1975), seismic drill rigs and camps (Riewe 1973; Urquhart 1973; Slaney and Co., Ltd. 1975; Sachs Harbour HTC 2013); and 3) habitat loss, especially in critical areas for calving and higher-density areas (SARC 2012; Resolute Bay HTO 2013; Sachs Harbour HTC 2013).

Inuit in Resolute Bay and Grise Fiord suggested that disturbance by oil and gas exploration activities and prospecting for coal and base metals inhibited Peary Caribou from moving into areas necessary for their survival during years of high snow accumulation (Jenkins *et al*. 2010a, b; Taylor 2005).

Habitat loss from cumulative impacts of individual projects and associated infrastructure is the chief cause of concern for Peary Caribou; impacts have been well documented for caribou in general (Vistnes *et al.* 2008; Festa-Bianchet *et al.* 2011). The scale of development currently being contemplated by industry and the Government of Canada – new ports, mines, roads and expanding human populations (Government of Canada 2013) – may be a threat to Peary Caribou if not managed as to location and timing (e.g., migration routes, calving and rutting areas) of construction. Peary Caribou avoid industrial activities including roads and off-road vehicle traffic, although some individuals may approach a single vehicle out of curiosity (Slaney and Co., Ltd. 1974, 1975; Nellemann and Cameron 1998), they also avoid helicopters (Gunn 1984; Gunn and Miller 1980). Although these effects are localized, they may involve increased energy expenditure during nutritionally challenging periods and displacement from preferred habitats. The cumulative stressors may also lead to increased susceptibility to infectious diseases.

**Other Threats**

Work and Other Activities (IUCN Threat #6.2 [Military exercises]; 6.3)

There are signs that human intrusions from work (non-tourist) activities and year-round military exercises are increasing in some parts of Peary Caribou range, with increases in traffic from snowmobiles, helicopters, and airplanes (including unscheduled flights). If such human activities interrupt caribou foraging or lead to avoidance behaviour affecting movements, this may increase caribou energetic costs (Weladji and Forbes 2002). Grise Fiord and Resolute Bay Inuit have also documented concerns about potential negative impacts of netting, collaring, and other research activities on Peary Caribou (Iviq HTA 2013, Resolute Bay HTO 2013). No Peary Caribou captures have been undertaken in Nunavut since 2003 due to community concerns.

Air-borne Pollutants (IUCN Threat #9.5)

Global climate systems bring certain volatile organic compounds from southern to northern regions, where they condense, precipitate, and accumulate (e.g., Prowse *et al*. 2009). Mainland and Baffin Island Barren-ground Caribou have trace amounts of organic contaminants such as HCB (hexachlorobenzene) and PCB (polychlorinated biphenyl) that are probably transported atmospherically from other continents such as Asia (Elkin and Bethke 1995). In the 1990s, contaminant levels were measured in Peary Caribou on Banks Island, and it was found that these caribou had the lowest levels reported in the study of 15 Canadian caribou subpopulations and are similar to background levels found in humans (MacDonald *et al.* 1996; Larter and Nagy 2000b). Inuit and Inuvialuit communities have voiced concerns about contaminant levels, e.g., on Bathurst Island (Resolute Bay HTO 2013).

Peary Caribou on Banks had lower levels of kidney heavy metals than mainland Barren-ground Caribou, which Larter and Nagy (2000b) attributed to low levels of lichen in their diet. Those metals are naturally occurring elements with no known local anthropogenic sources.

### Number of Locations

The highest threat to Peary Caribou is from climate change-induced habitat changes (e.g., severe weather events and sea ice loss), but the timing and geographic location of threatening events that might take place as a result makes it impossible to estimate the number of discrete locations, as defined by IUCN (2014).

## PROTECTION, STATUS AND RANKS

Peary Caribou are co-managed in Nunavut according to the Nunavut Land Claims Agreement and in NWT according to the Inuvialuit Final Agreement. These agreements confer primary wildlife management authority on the respective management boards: the Nunavut Wildlife Management Board and the Wildlife Management Advisory Council (NWT).

### Legal Protection and Status

COSEWIC most recently assessed this species as Threatened in 2015. Peary Caribou are currently listed under Schedule 1 as Endangered under the federal *Species at Risk Act* (2011); Canada Gazette Part II, Vol. 145, No. 4, 2011-02-16). Under the *Species at Risk Act* (NWT), Peary Caribou are listed as threatened in NWT. Provisions for Species at Risk designation under the *Nunavut Wildlife Act* have not yet been enacted.

### Non-Legal Status and Ranks

The NatureServe global status rank of Peary Caribou is G5T1 (2012), signifying this as a critically imperiled subspecies of an otherwise widespread and common species. Its national status is N1; it is S1 in NWT and SNR (unranked) in Nunavut (NatureServe 2014).

### Habitat Protection and Ownership

All land except owned privately, by Inuit Organizations or by municipalities, is Crown Land in right of the respective territories. Figure 7 shows the national parks and other federally protected areas. National parks in the range of Peary Caribou are Quttinirpaaq National Park (Ellesmere Island), Qausuittuq National Park (Bathurst Island), and Aulavik National Park (Banks Island).

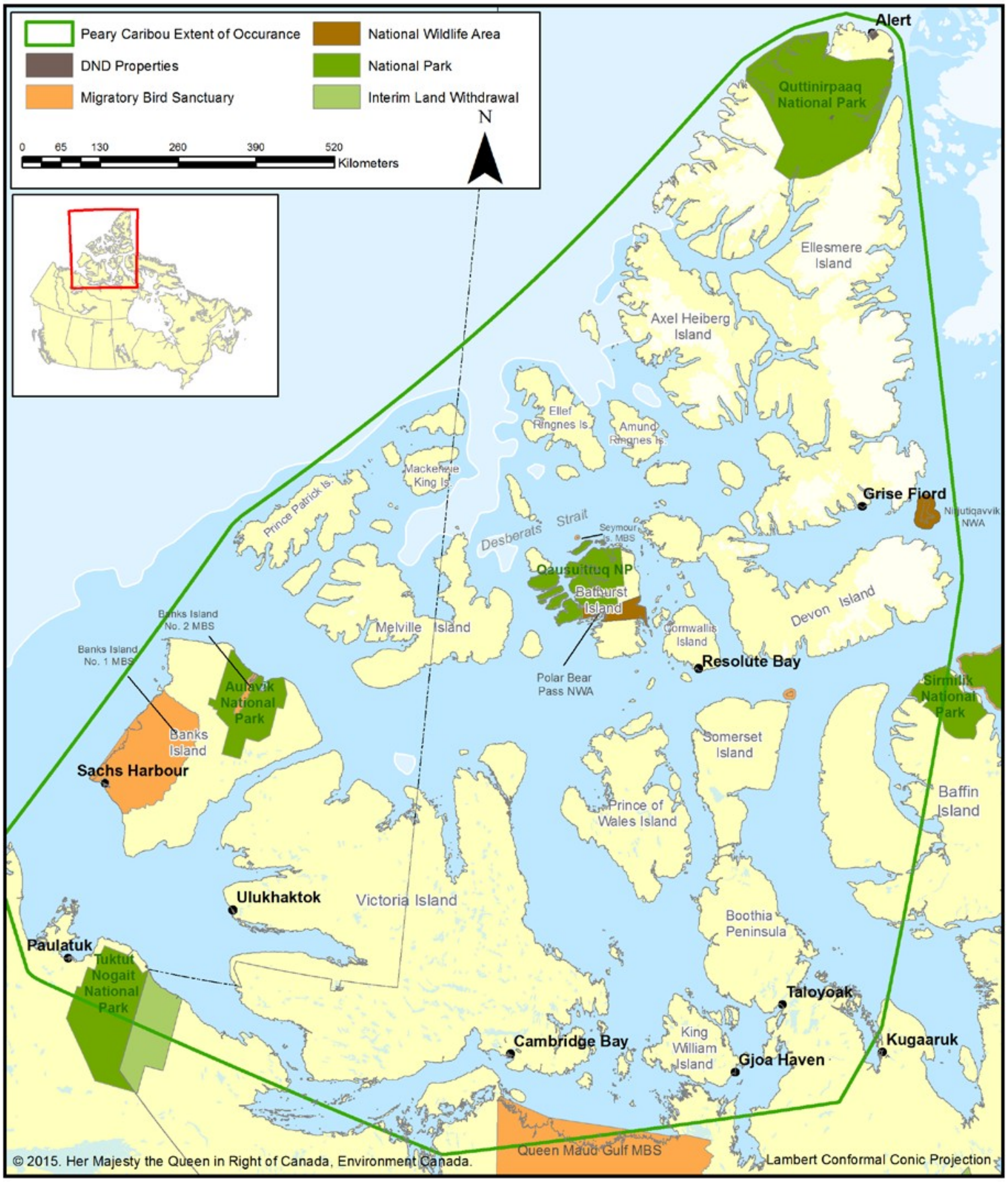



Figure 7. National parks and other protected areas (e.g., Wildlife Management Areas and Migratory Bird Sanctuaries). Map created by Dawn Andrews (Environment Canada).

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## BIOGRAPHICAL SUMMARY OF REPORT WRITER

Dr. Lee E. Harding has a BSc in wildlife management and a PhD in wildlife toxicology. He is the principal of SciWrite Environmental Sciences Ltd. and was formerly a senior biologist and science program manager with Environment Canada from 1976 until he took early retirement in 1997. From 1977 to 1980 he managed the Impact Assessment division of the Environmental Protection Service district office in Yellowknife, NWT. During 1972-1976, as an environmental consultant assessing the impact of industrial developments in the Arctic, he studied Barren-ground Caribou and reindeer in the Mackenzie Delta, mountain caribou in British Columbia and Yukon and Peary Caribou on Bathurst, Melville and Little Cornwallis Islands. He first called attention to the possible endangered status of British Columbia’s mountain caribou in a magazine article in 1975. He was the author of the 2004 COSEWIC re-assessment of Peary Caribou.

## COLLECTIONS EXAMINED

Collections were not examined for this reassessment.

**Appendix 1A. Survey estimates and area-corrected population estimates for surveys of Banks-Victoria Island subpopulation (adapted from Johnson *et al*. in prep.).**

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area sampled (km$^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Banks | 1970 | June | 5300 | | inc. calves | 38804 | 1.8301 | 9699 | Kevan 1974 |
| Banks | 1971 | June | 10327 | | inc. calves | 74333 | 0.9554 | 9866 | Urquhart 1973 |
| Banks | 1972 | Sept. | 12098 | | inc. calves | 74333 | 0.9554 | 11558 | Urquhart 1973 |
| Banks | 1982 | July | 9036 ± 2927 | 95% CI | Non-Calf | 70582 | 1.0061 | 9091 | Nagy *et al*. 2009d |
| Banks | 1985 | July | 4931 ± 914 | SE | Non-Calf | 70266 | 1.0064 | 4983 | Nagy *et al*. 1996 |
| Banks | 1987 | June | 4251 ± 663 | SE | Non-Calf | 70266 | 1.0064 | 4296 | Nagy *et al*. 1996 |
| Banks | 1989 | June | 2641 ± 344 | SE | Non-Calf | 70266 | 1.0164 | 2669 | Nagy *et al*. 1996 |
| Banks | 1991 | June - July | 897 ± 151 | SE | Non-Calf | 70266 | 1.0164 | 907 | Nagy et al. 1996 |
| Banks | 1992 | August | 1018 ± 270 | 95% CI | Non-Calf | 70583 | 1.0061 | 1024 | Nagy *et al*. 2009f |
| Banks | 1994 | July | 742 ± 132 | 95% CI | Non-Calf | 70583 | 1.0061 | 747 | Nagy *et al*. 2013b |
| Banks | 1998 | July | 451 ± 123 | 95% CI | Non-Calf | 70583 | 1.0061 | 454 | Nagy *et al*. 2013a |
| Banks | 2001 | July | 1142 ± 324 | 95% CI | Non-Calf | 70583 | 1.0061 | 1149 | Nagy *et al*. 2006 |
| Banks | 2005 | July - Aug. | 929 ± 289 | 95% CI | Non-Calf | 70585 | 1.0061 | 935 | Nagy *et al*. 2009e |
| Banks | 2010 | July | 1097 ± 343 | 95% CI | Non-Calf | 70579 | 1.0061 | 1104 | Davison *et al*. 2013 |
| Banks | 2014 | July | 2234 ± 830 | 95% CI | Non-Calf | 70580 | 1.0061 | 2248 | Davison *et al*. 2014 |
| Victoria (NW) | 1980 | August | 4512 ± 988 | SE | inc. calves | 33520 | 1.0668 | 4,814 | Jakimchuk and Carruthers 1980 |
| Victoria (NW) | 1987 | June | 2600 | | non-calf | 32710 | 1.0932 | 2800 | Gunn 2005; Gunn and Fournier, 2000 |
| Victoria (NW) | 1993 | June | 159 | | inc calves | 22363 | 1.5990 | 250 | Gunn 2005 |
| Victoria (NW) | 1994 | June | 39 ± 28 | SE | inc calves | 26992 | 1.3248 | 52 | Nishi and Buckland 2000 |
| Victoria (NW) | 1998 | July | 95 ± 60 | 95% CI | non-calf | 24880 | 1.4373 | 137 | Nagy *et al*. 2009c |
| Victoria (NW) | 2001 | July | 204 ± 103 | 95% CI | non-calf | 20364 | 1.7560 | 358 | Nagy *et al*. 2009a |
| Victoria (NW) | 2005 | July | 66 ± 61 | 95% CI | non-calf | 20364 | 1.7560 | 116 | Nagy *et al*. 2009b |

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Victoria (NW) | 2010 | Jul-Aug. | 150 ± 104 | 95% CI | non-calf | 20364 | 1.7560 | 263 | Davison and Williams 2013 |
| Victoria (NW) | 2015 | Apr.-May | 2 | | Min. num. (non-calf) | 20364 | 1.7560 | 4 | Davison and Williams 2015 |

**Appendix 1B. Survey estimates and area-corrected population estimates for surveys of Prince of Wales-Somerset-Boothia subpopulation (adapted from Johnson *et al*. in prep.).**

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Boothia | 1974 | August | 561 | | includes calves | 33000 | 0.9723 | 545 | Fischer and Duncan 1976 |
| Boothia | 1975 | June | 1739 | | includes calves | 32811 | 0.9779 | 1701 | Fischer and Duncan 1976 |
| Boothia | 1976 | March | 1120 | | includes calves | 32941 | 0.9740 | 1091 | Thompson and Fischer 1980 |
| Boothia | 1985 | June | 4831±543 | SE | adults and 1year olds | 32715 | 0.9808 | 4738 | Gunn and Ashevak 1990, Gunn and Dragon 1998 |
| Boothia | 1995 | July and August | 3329 | | adults and 1year olds | 32715 | 0.9808 | 3265 | Gunn and Dragon 1998 |
| Boothia | 2006 | June | 1 | | minimum count | 32715 | 0.9808 | 1 | Dumond 2006 |
| Prince of Wales | 1974 | July | 5437 | | includes calves | 33770 | 1.0000 | 5437 | Fischer and Duncan 1976 |
| Prince of Wales | 1975 | June | 3768 | | includes calves | 33643 | 1.0038 | 3768 | Fischer and Duncan 1976 |
| Prince of Wales | 1980 | July | 3952±932 | 95% CI | adults and 1year olds | 31686 | 1.0658 | 3952 | Gunn and Decker 1984 |
| Prince of Wales | 1995 | July | 5 | | minimum count | 32946 | 1.0251 | 5 | Gunn and Dragon 1998 |
| Prince of Wales | 1996 | April and May | 0 | | | 33340 | 1.0129 | 0 | Miller 1997a |
| Prince of Wales | 2004 | April | 0 | | | 33274 | 1.0150 | 0 | Jenkins *et a*l. 2011 |
| Somerset | 1974 | June | 245 | | includes calves | 24786 | 0.9892 | 242 | Fischer and Duncan 1976 |

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled (km$^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Somerset | 1975 | June | 903 | | includes calves | 24786 | 0.9892 | 893 | Fischer and Duncan 1976 |
| Somerset | 1980 | July | 561±300 | 95% CI | adults and 1year olds | 23818 | 1.0294 | 577 | Gunn and Decker 1984 |
| Somerset | 1995 | July and August | 2 | | minimum count | 8544 | 2.8695 | 115 | Gunn and Dragon 1998 |
| Somerset | 1996 | April and May | 2 | | minimum count | 23818 | 1.0294 | 49 | Miller 1997a |
| Somerset | 2004 | April | 0 | | | 25549 | 0.9596 | 0 | Jenkins *et a*l. 2011 |
| Russell | 1975 | June | 159 | | includes calves | 940 | 1.0251 | 163 | Fischer and Duncan 1976 |
| Russell | 1980 | July | 584±90 | 95% CI | adults and 1year olds | 930 | 1.0362 | 605 | Gunn and Decker 1984 |
| Russell | 1995 | July | 0 | | | 975 | 0.9883 | 0 | Gunn and Dragon 1998 |
| Russell | 1996 | April and May | 0 | | | 940 | 1.0251 | 2 | Miller 1997a |
| Russell | 2004 | April | 0 | | | 937 | 1.0284 | 0 | Jenkins *et al*. 2011 |

## Appendix 1C. Survey estimates and area-corrected population estimates for surveys of Eastern Queen Elizabeth Islands subpopulation (adapted from Johnson *et al*. in prep.).

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled (km$^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Axel Heiberg | 1961 | August | 300 | | includes calves | 30232 | 1.0053 | 302 | Tener 1963 |
| Axel Heiberg | 1973 | July | 35 | | includes calves | 1010 | 30.0867 | 1053 | Riewe 1973 |
| Axel Heiberg | 1995 | June | 25 | | minimum count (includes calves) | 8101 | 3.7515 | 94 | Gauthier 1996 |
| Axel Heiberg | 2007 | Apr.-May | 2291 (1636-3208) | 95% CI | 10 month olds and adults | 30877 | 0.9842 | 2255 | Jenkins *et al*. 2011 |

| Island | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Ellesmere Island | 1961 | Jun-Aug | 200 | | includes calv es | 116407 | 0.9585 | 192 | Tener 1963 |
| Southern Ellesmere | 1973 | July | 450 | | includes calv es | 19788 | 5.6389 | 2538 | Riewe 1973 |
| Southern Ellesmere | 1989 | July | 89±31 | SE | includes calv es | 25050 | 4.4543 | 396 | Case and Ellesworth 1991 |
| Central Ellesmere | 1995 | June | 38 | | minim um count (includes calves) | 28383 | 3.9313 | 149 | Gauthier 1996 |
| Southern Ellesmere | 2005 | May | 219 (109-442) | 95% CI | adults and 1year olds | 22243 | 5.0164 | 1099 | Jenkins *et al*. 2011 |
| Northern Ellesmere | 2006 | Apr,-May | 802 (531-1207) | 95% CI | adults and 1year olds | 96567 | 1.1555 | 927 | Jenkins *et al*. 2011 |
| Southern Ellesmere | 2015 | March | 183 ± 128 | SE | adults and 10-month | 22243 | 5.0164 | 918 | Anderson and Kingsley 2015 |

## Appendix 1D. Survey estimates and area-corrected population estimates for surveys of Western Queen Elizabeth Islands subpopulation (adapted from Johnson *et al*. in prep.).

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Melville | 1961 | August | 12,799 | | Includes Calves | 41334 | 1.0349 | 13246 | Tener 1963 |
| Melville | 1972 | August | 2,551 ± 724 | SE | Includes Calves | 42220 | 1.0132 | 2585 | Miller *et al*. 1977b; SARC 2012: Jenkins *et al.* 2011 |
| Melville | 1973 | July and August | 3,425 ± 618 | SE | Includes Calves | 42220 | 1.0132 | 3470 | Miller *et al*. 1977b; SARC 2012: Jenkins *et al*. 2011 |
| Melville | 1974 | July and August | 1679 | | Includes Calves | 42220 | 1.0132 | 1701 | Miller *et al*. 1977b; SARC 2012: Jenkins *et al*. 2011 |
| Melville | 1987 | July | 943 ±126 | SE | Includes Calves | 42220 | 1.0132 | 955 | Miller 1988 |
| Melville | 1997 | July | 787 ± 97 | SE | No calves seen | 42220 | 1.0132 | 797 | Gunn and Dragon 2002 |
| Melville | 2012 | July-August | 2,728 ± 647 | 95% CI | 1+ yr old | 42583 | 1.0045 | 2740 | Davison and Williams 2012 |

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Prince Patrick | 1961 | July | 2,254 | | Includes Calves | 15750 | 1.0360 | 2335 | Tener 1963 |
| Prince Patrick | 1973 | July-August | 807 ± 259 | SE | Includes Calves | 15830 | 1.0307 | 832 | Miller *et al*. 1977b; SARC 2012; Jenkins *et al*. 2011 |
| Prince Patrick | 1974 | July-August | 621 ± 177 | SE | Includes Calves | 15830 | 1.0307 | 640 | Miller *et al*. 1977b; SARC 2012; Jenkins *et al*. 2011 |
| Prince Patrick | 1986 | July | 151 | | Includes Calves | 15830 | 1.0307 | 156 | Miller 1987 |
| Prince Patrick | 1997 | June | 84 ± 34 | SE | 1+ yr old | 15830 | 1.0307 | 87 | Gunn and Dragon 2002 |
| Prince Patrick | 2012 | July-August | 2,708 ± 855 | 95% CI | 1+ yr old | 16090 | 1.0141 | 2746 | Davison and Williams 2012 |
| Eglinton | 1961 | July | 204 | | Includes Calves | 1427 | 1.0917 | 223 | Tener 1963 |
| Eglinton | 1972 | August | 83 ± 59 | SE | Includes Calves | 1550 | 1.0051 | 83 | Miller *et al*. 1977b |
| Eglinton | 1973 | August | 12 ± 9 | SE | Includes Calves | 1550 | 1.0051 | 12 | Miller *et al*. 1977b |
| Eglinton | 1974 | July | 18 ± 10 | SE | Includes Calves | 1550 | 1.0051 | 18 | Miller *et al*. 1977b |
| Eglinton | 1986 | July | 79 | | Includes Calves | 1550 | 1.0051 | 79 | Miller 1987 |
| Eglinton | 1997 | July | 0 | SE | | 1550 | 1.0051 | 0 | Gunn and Dragon 2002 |
| Eglinton | 2012 | July-August | 181 ± 134 | 95% CI | 1+ yr old | 1573 | 0.9902 | 181 | Davison and Williams 2012 |
| Emerald | 1961 | July | 161 | | Includes Calves | 650 | 0.8556 | 138 | Tener 1963 |
| Emerald | 1973 | July | 39 | | Includes Calves | 550 | 1.0113 | 39 | Miller *et al*. 1977b |
| Emerald | 1974 | July | 20 | | Includes Calves | 550 | 1.0113 | 20 | Miller *et al*. 1977b |
| Emerald | 1986 | July | 14 (0-49) | 95% CI | Includes Calves | 550 | 1.0113 | 14 | Miller 1987 |
| Emerald | 1997 | July | 0 | | | 550 | 1.0113 | 0 | Gunn and Dragon 2002 |
| Emerald | 2012 | July-August | 46±78 | 95% CI | 1+ yr old | 570 | 0.9756 | 45 | Davison and Williams 2012 |
| Byam Martin | 1972 | August | 86 ± 65 | SE | Includes Calves | 1160 | 1.0189 | 88 | Miller *et al*. 1977b; Jenkins *et al*. 2011 |
| Byam Martin | 1973 | July | 43 ± 36 | SE | Includes Calves | 1160 | 1.0189 | 44 | Miller *et al*. 1977b; Jenkins *et al*. 2011 |

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Byam Martin | 1974 | August | 6±4 | SE | Includes Calves | 1160 | 1.0189 | 6 | Miller *et al.* 1977b; Jenkins *et al.* 2011 |
| Byam Martin | 1987 | July | 98 ± 37 | SE | Includes Calves | 1160 | 1.0189 | 100 | Miller 1988; Jenkins *et al.* 2011 |
| Byam Martin | 1997 | July | 0 | | | 1160 | 1.0189 | 0 | Gunn and Dragon 2002; Jenkins *et al.* 2011 |
| Byam Martin | 2012 | July-August | 119 ± 73 | 95% CI | non-calves | 1158 | 1.0207 | 121 | Davison and Williams 2012 |
| Mackenzie King | 1961 | August | 2,192 | | All | | | 2192 | Tener 1963 |
| Mackenzie King | 1973 | April | 3 | | Minimum count | | | 3 | Miller *et al.* 1977b |
| Mackenzie King | 1974 | April | 60 | | All | | | 60 | Miller *et al.* 1977b |
| Mackenzie King | 1997 | July | 36 ± 22 | SE | 1+ yr old | | | 36 | Gunn and Dragon 2002 |
| Borden | 1961 | August | 1,630 | | All | | | 1630 | Tener 1963 |
| Borden | 1973 | April | 16 | | All | | | 16 | Miller *et al.* 1977b |
| Brock | 1961 | August | 190 | | All | | | 190 | Tener 1963 |
| Brock | 1973 | April | 24 | | All | | | 24 | Miller *et al.* 1977b |
| Brock | 1997 | July | 0 | | | | | 0 | Gunn and Dragon 2002 |
| Devon | 1961 | June | 150 | | includes calves | 37550 | 1.0323 | 155 | Tener 1963 |
| Devon | 2002 | May | 35 | | min. count (includes calves) | 12316 | 3.1475 | 110 | Jenkins *et al.* 2011 |
| Devon | 2008 | April-May | 17 | | min. count (includes calves) | 39731 | 0.9757 | 17 | Jenkins *et al.* 2011 |
| Lougheed | 1961 | August | 1325 | | includes calves | 808 | 1.6458 | 2181 | Tener 1963 |
| Lougheed | 1973 | April | 66 | | includes calves | 1300 | 1.0230 | 68 | Miller *et al.* 1977b |
| Lougheed | 1974 | April | 0 | | | 1300 | 1.0230 | 0 | Miller *et al.* 1977b |

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled (km$^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Lougheed | 1985 | July | 0 | | | 1300 | 1.0230 | 0 | Miller 1987b |
| Lougheed | 1997 | July | 101±73 | SE | 1+year | 1300 | 1.0230 | 103 | Gunn and Dragon 2002 |
| Lougheed | 2007 | April | 372 (205-672) | 95% CI | 1+year | 1319 | 1.0083 | 375 | Jenkins *et al*. 2011 |
| Bathurst Is. Complex | 1961 | June and July | 3509 | | Includes calves | | | 3509 | Tener 1963; adjusted by Miller *et al.* 2005 |
| Bathurst Is. Complex | 1973 | March-April | 990 | | Includes calves | 19266 | 1.0350 | 1025 | Miller *et al*. 1977b |
| Bathurst Is. Complex | 1974 | August | 269 | | Includes calves | 19266 | 1.0350 | 278 | Miller *et al*. 1977b |
| Bathurst Is. Complex | 1985 | July | 724 (460-987) | 95% CI | Includes calves | 19266 | 1.0350 | 749 | Miller 1987b |
| Bathurst Is. Complex | 1988 | July | 1034±146 | SE | Includes calves | 19266 | 1.0350 | 1070 | Miller 1989 |
| Bathurst Is. Complex | 1990 | July | 871 | | min. count (includes calves) | 19266 | 1.0350 | 901 | Miller 1992 |
| Bathurst Is. Complex | 1991 | June and July | 949 | | min. count (includes calves) | 19266 | 1.0350 | 982 | Miller 1993 |
| Bathurst Is. Complex | 1992 | July | 1644 | | min. count (includes calves) | 19266 | 1.0350 | 1701 | Miller 1994 |
| Bathurst Is. Complex | 1993 | August | 2387 | | min. count (includes calves) | 19266 | 1.0350 | 2470 | Miller 1995b |
| Bathurst Is. Complex | 1994 | July | 3100 | | Includes calves | 27550 | 0.7238 | 2244 | Miller 1997b; Miller 1998 |
| Bathurst Is. Complex | 1995 | July | 2200 | | min. count (includes calves) | 27550 | 0.7238 | 1592 | Miller 1997b; Miller 1998 |
| Bathurst Is. Complex | 1996 | July | 552±108 | SE | Includes calves | 27550 | 0.7238 | 400 | Miller 1998 |
| Bathurst Is. Complex | 1997 | June and July | 78 | | 1+ year old | 19266 | 1.0350 | 81 | Gunn and Dragon 2002 |
| Bathurst Is. Complex | 2001 | May | 187 (104-330) | 95% CI | 1+ year old | 19644 | 1.0150 | 190 | Jenkins *et al*. 2011 |
| Bathurst Is. Complex | 2013 | May | 1482±387 | 95% CI | Includes calves | 20200 | 0.9871 | 1463 | Anderson 2014 |
| Cornwallis | 1961 | June | 43 | | Includes calves | 6915 | 1.0338 | 44 | Tener 1963 |

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled (km$^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Cornwallis | 1988 | July | 51 (0-107) | 95% CI | Includes calves | 7000 | 1.0213 | 52 | Miller 1989 |
| Cornwallis | 2002 | May | 1 | | Minimum count | 3411 | 2.0958 | 2 | Jenkins *et al*. 2011 |
| Cornwallis | 2013 | May | 2 | | min. count (includes calves) | 3411 | 2.0958 | 4 | Anderson 2014 |
| Little Cornwallis | 1961 | June | 0 | | | 412 | 1.0249 | 0 | Tener 1963 |
| Little Cornwallis | 1973 | Mach and August | 9 | | Includes calves | 410 | 1.0294 | 9 | Miller *et al*. 1977b |
| Little Cornwallis | 1974 | March | 12 | | Includes calves | 410 | 1.0294 | 12 | Miller *et al*. 1977b |
| Little Cornwallis | 1988 | July | 0 | | | 410 | 1.0294 | 0 | Miller 1989 |
| Little Cornwallis | 2002 | May | 0 | | | 381 | 1.1077 | 0 | Jenkins *et al.* 2011 |
| Little Cornwallis | 2013 | May | 1 | | minimum total count | 381 | 1.1077 | 1 | Anderson 2014 |
| Helena | 1973 | April | 0 | | Includes calves | 220 | 1.5043 | 0 | Miller *et al.* 1977b |
| Helena | 1974 | March | 3 | | Includes calves | 220 | 1.5043 | 5 | Miller *et al.* 1977b |
| Helena | 1985 | July | 0 | | | 220 | 1.5043 | 0 | Miller 1987 |
| Helena | 1988 | July | 17 (0-42) | 95% CI | Includes calves | 220 | 1.5043 | 26 | Miller 1989 |
| Helena | 1990 | July | 34 | | min. count (includes calves) | 220 | 1.5043 | 51 | Miller 1992 |
| Helena | 1991 | June | 22 | | min. count (includes calves) | 220 | 1.5043 | 33 | Miller 1993 |
| Helena | 1992 | June | 46 | | min. count (includes calves) | 220 | 1.5043 | 69 | Miller 1994 |
| Helena | 1995 | June | 49 | | min. count (includes calves) | 220 | 1.5043 | 74 | Miller 1997b |
| Helena | 1997 | July | 0 | | | 220 | 1.5043 | 0 | Gunn and Dragon 2002 |
| Helena | 2001 | May | 2 | | min. count (includes calves) | | | | Jenkins *et al* 2011 |

| Island Group | Year | Month | Survey Estimate | Error type | Age Class | Area Sampled ($km^2$) | Scaling factor | Area-corrected population est. | References |
|---|---|---|---|---|---|---|---|---|---|
| Helena | 2013 | May | 2 | | min. count (includes calves) | | | | Anderson 2014 |

## Appendix 2. IUCN Threats calculator for Peary Caribou (DU1).

| | |
|---|---|
| **Species:** | Peary Caribou (DU1) |
| **Date:** | 12/09/2014 |
| **Assessor(s):** | Members: Justina Ray (TM SSC Co-chair, moderator), Dave Fraser (BC, moderator), Dan Benoit (ATK SC Co-chair), Suzanne Carrière (NT), Nic Larter (NT)<br><br>External Experts: Tracy Davison (NT), Marsha Branigan (NT), Joanna Wilson (NT), Morgan Anderson (NU), Lisa-Marie LeClerc (NU), Andrew Maher (PCA), Renee Wissink (PCA), Peter Sinkins (PCA), David Lee (NTI), Cheryl Johnson (EC), Agnes Richards (EC), Donna Bigelow (CWS), Dawn Andrews (CWS), Lisa Pirie (CWS), Anne Gunn (Status Report writer for Barren-ground Caribou (DU3)), Karla Letto (NWMB), John Lucas (WMAC), Phillip Manik, Sr. (Resolute Bay HTO), Peter Qayutinuak Sr. (Spence Bay HTA - Taloyoak), Issiac Elanik (Sachs Harbour HTC), Bradley Carpenter (Olohaktomiut HTC - Uluhaktok) |

| **Overall Threat Impact Calculation Help:** | | Level 1 Threat Impact Counts | |
|---|---|---|---|
| Threat Impact | | high range | low range |
| A | Very High | 0 | 0 |
| B | High | 1 | 0 |
| C | Medium | 2 | 1 |
| D | Low | 3 | 5 |
| **Calculated Overall Threat Impact:** | | Very High | High |

| | |
|---|---|
| **Assigned Overall Threat Impact:** | **AC = Very High - Medium** |
| **Impact Adjustment Reasons:** | There is considerable uncertainty and potential overlap and interaction of threats that is difficult to predict and assess and that might be best captured with a wide range rank of threat impacts. |

| Threat | | Impact (calculated) | | Scope (next 10 Yrs) | Severity (10 Yrs or 3 Gen.) | Timing | Comments |
|---|---|---|---|---|---|---|---|
| 1 | Residential & commercial development | | Negligible | Negligible (<1%) | Extreme (71-100%) | High (Continuing) | |
| 1.1 | Housing & urban areas | | Negligible | Negligible (<1%) | Extreme (71-100%) | High (Continuing) | Scope includes portion of species range that is alienated by human settlements plus a buffer zone for animals displaced by disturbance. |
| 3 | Energy production & mining | D | Low | Restricted - Small (1-30%) | Slight (1-10%) | High (Continuing) | |
| 3.1 | Oil & gas drilling | D | Low | Restricted - Small (1-30%) | Slight (1-10%) | Moderate (Possibly in the short term, < 10 yrs) | No seismic activity or O&G development at present but an expectation was expressed by participants that this is very likely to increase within the next 10 years. There is some experience of impacts to caribou populations from seismic drilling activities (particularly blasting) in the 1970s, although difficult to tease apart from other sources of decline. Impacts will be higher if high intensity activities occur where most of the population is at that time. |

| Threat | | Impact (calculated) | | Scope (next 10 Yrs) | Severity (10 Yrs or 3 Gen.) | Timing | Comments |
|---|---|---|---|---|---|---|---|
| 3.2 | Mining & quarrying | D | Low | Small (1-10%) | Slight (1-10%) | High (Continuing) | There is mineral exploration underway, e.g., coal on Foshein Peninsula on Ellesmere Island and on Axel Heiberg Island, staking for coal on Banks Island but these activities ceased when markets fell. A number of old sites on Prince Patrick Island and Victoria Island require clean-up. |
| 4 | Transportation & service corridors | CD | Medium - Low | Restricted - Small (1-30%) | Serious - Moderate (11-70%) | High (Continuing) | |
| 4.1 | Roads & railroads | D | Low | Small (1-10%) | Slight (1-10%) | Moderate (Possibly in the short term, < 10 yrs) | |
| 4.2 | Utility & service lines | | Negligible | Negligible (<1%) | Negligible (<1%) | Unknown | |
| 4.3 | Shipping lanes | CD | Medium - Low | Restricted - Small (1-30%) | Serious - Moderate (11-70%) | High (Continuing) | There is a large range of uncertainty associated with this threat, particularly looking out to the next 10 years. The severity to the overall population will depend on which island crossings are affected and how big are the populations. Shipping channels could open in Prince of Wales complex (PoW-Somerset and Queen Elizabeth-PoW crossings), Bathurst – Cornwallis; less likely Banks-Victoria, Ellesmere complex. For Peary Caribou, island crossings between islands are exceptionally important. In next 10 years develop projects that require shipping could have high impact on available crossings for caribou, as well as cruise ships. Ships & ice breakers come earlier and earlier every year and stay and keep breaking the ice to make it safer for the cruise ships continue to break ice until season is over. Kitikmeot region opening of NW Passage increase transport minerals south. |
| 4.4 | Flight paths | | Negligible | Negligible (<1%) | Slight (1-10%) | Moderate - Low | Regularly scheduled commercial flights |
| 5 | Biological resource use | D | Low | Small (1-10%) | Slight (1-10%) | High (Continuing) | |

| Threat | | Impact (calculated) | | Scope (next 10 Yrs) | Severity (10 Yrs or 3 Gen.) | Timing | Comments |
|---|---|---|---|---|---|---|---|
| 5.1 | Hunting & collecting terrestrial animals | D | Low | Small (1-10%) | Slight (1-10%) | High (Continuing) | There are many other threats and circumstances that can interact with this one when it comes to determining severity: climate, management response, and quality of survey information. In terms of scope, a large portion of range not accessible. Severity: there are quotas in place where they are hunted, and not all caribou that encounter a hunter will be killed. If management is doing its job, there should be no decline. Increasing the severity to slight takes into account other factors that may lead to a decline, including unreported mortality and inaccurate knowledge of population status. |
| 6 | Human intrusions & disturbance | D | Low | Restricted (11-30%) | Slight (1-10%) | High (Continuing) | |
| 6.1 | Recreational activities | | Negligible | Negligible (<1%) | Negligible (<1%) | High (Continuing) | |
| 6.2 | War, civil unrest & military exercises | D | Low | Restricted (11-30%) | Slight (1-10%) | High (Continuing) | Year-round military exercises are increasing in Peary Caribou range; mostly ships and land exercises. Military personnel are travelling long distances, from island to island. We can expect this to increase in the future. |
| 6.3 | Work & other activities | D | Low | Restricted (11-30%) | Slight (1-10%) | High (Continuing) | This relates to activities on land for work: i.e., snowmobiles, helicopters, airplanes. Includes unscheduled flights. More research (e.g., climate change) is taking place and traffic is increasing as a result. |
| 8 | Invasive & other problematic species & genes | C D | Medium - Low | Pervasive (71-100%) | Moderate - Slight (1-30%) | High (Continuing) | |
| 8.1 | Invasive non-native/alien species | C D | Medium - Low | Large - Restricted (11-70%) | Moderate - Slight (1-30%) | High (Continuing) | Pathogens include native & non-native species in this category. In terms of the scope, there is much uncertainty as to how much of the population will be affected by pathogens within the next 10 years; probably not over 50% given current evidence and accounting for uncertainty. Need to consider the interaction of a changing climate on pathogen-host relationships that is already being documented. Could have more cycles of parasites with increased temperatures. |
| 8.2 | Problematic native species | D | Low | Pervasive (71-100%) | Slight (1-10%) | High (Continuing) | Muskoxen, wolves, wolverines, and grizzly bears considered in this category, not disease. Scope must be pervasive because all Peary Caribou encounter one or more of these species. The direct impact is uncertain but likely to be low. There is, however, evidence for an inverse relationship between caribou and muskox in some areas, although this is variable throughout the distribution of Peary Caribou. The mechanism for this is unknown, but could be aversion. In some areas, elders say that muskox need to be controlled to keep Peary Caribou populations healthy. |

| Threat | | Impact (calculated) | | Scope (next 10 Yrs) | Severity (10 Yrs or 3 Gen.) | Timing | Comments |
|---|---|---|---|---|---|---|---|
| 8.3 | Introduced genetic material | | Unknown | Small (1-10%) | Unknown | High (Continuing) | The future depends on climate change and the extent to which Barren-ground and Peary or D&U and Peary meet and hybridize. The only place where there is a real possibility of mixing is on NW Victoria, affecting 10% of the overall population. Results from genetic analyses are showing a lot of Peary Caribou gene flow southward and not a corresponding northward flow of Barren-ground genes; As such, the impact would expect to be felt by D&U and Barren-ground. However, the impact (severity) on Peary Caribou is fundamentally unknown. |
| 9 | Pollution | | Unknown | Pervasive (71-100%) | Unknown | High (Continuing) | |
| 9.5 | Air-borne pollutants | | Unknown | Pervasive (71-100%) | Unknown | High (Continuing) | There are few sources of contaminants in NU or NWT, but they can be sink holes for southern air-borne pollution. Because of wind currents scope is everywhere. Although lichen does tend to collect air-borne pollution, it is a small part of Peary Caribou diet. It would be more of a concern if arctic willow sucked up pollutants. Studies have shown that Banks Island caribou have lower pollution load than mainland. There is a growing concern around pollinated bromiles (used in fire retardants), which may act like DDT and are showing up in wildlife in NWT; Unknown effects. Air currents bring pollutants from India/China to arctic; volatile contents condense; precipitate out in arctic where they land on snow or ice and go into aquatic systems; lighter fractions that are more volatile are showing up in arctic ecosystems. |
| 11 | Climate change & severe weather | B C | High - Medium | Pervasive (71-100%) | Serious - Moderate (11-70%) | High (Continuing) | |
| 11 | Habitat shifting & alteration | B C | High - Medium | Pervasive (71-100%) | Serious - Moderate (11-70%) | High (Continuing) | This category includes sea ice loss; sea level rise; habitat changes as result of climate change and severe weather. Negative effects may be countered in some places by positive aspects like vegetation growth and biomass. But because much of this is shrubs, unclear how much Peary Caribou will actually benefit from this enhanced vegetation growth. If changes occur gradually, then there may be more opportunities for adaptation. This category does not include icing events (see 11.4) |

| Threat | | Impact (calculated) | | Scope (next 10 Yrs) | Severity (10 Yrs or 3 Gen.) | Timing | Comments |
|---|---|---|---|---|---|---|---|
| 11 | Storms & flooding | CD | Medium - Low | Restricted - Small (1-30%) | Serious - Moderate (11-70%) | Moderate (Possibly in the short term, < 10 yrs) | Peary Caribou can move to avoid smaller icing events, but frequent small events or one larger event (which may happen once every 1-2 generations) can have a high impact, as has been the case on at least two major occasions since monitoring of Peary Caribou began in the 60s. Although there is an expectation that the frequency of these events will increase in the next 3 generations due to climate change, there is considerable uncertainty regarding the impact to the overall Peary Caribou that can be expected. |

**Summary of comments relevant to the proposed downlisting of Peary caribou from Nunavut participants in dissusions on the recovery strategy**

During meetings to develop and review the Peary caribou Recovery Strategy, the abundance and trend of Peary Caribou was discussed. This document summarizes comments from these meetings that are relevant to the proposed downlisting of Peary caribou from endangered to threatened.

## 2016 Community Meetings:

- Ekaluktutiak Hunters and Trappers Organization and Cambridge Bay Public Meeting February 22, 2016
- Gjoa Haven HTA and Public Meeting February 23, 2016
- Spence Bay HTA and Taloyoak Public Meeting February 24, 2016
- Kugaaruk HTA and Public Meeting February 25, 2016
- Grise Fiord HTO and Public Meeting February 29, 2016
- Resolute Bay HTO and Public Meeting March 1, 2016

| **Question: Have Peary Caribou been increasing or decreasing in your area over the past: 10 years / 30 years?** | |
|---|---|
| Cambridge Bay | Very few Peary caribou have been sighted close by.<br><br>Even 30 years ago, used to go many miles north before finding Peary caribou. Had a lot of caribou around in the 80s, it has been way down in the last few years. |
| Gjoa Haven | We should not expect a big expansion of Peary Caribou, population level was always low. |
| Taloyoak | Saw them in the 80s-early 90s and used to eat them in the mid-80s early 90s but not since then, would not know if they are increasing, mainly because nobody goes there anymore. Started to see a decline in the 80s. |
| Kugaaruk | Never had large populations. Catch a few in the late 80s but now hardly see them. |
| Resolute Bay | In the last 4-5 years, seen an increase especially on Bathurst Island (Allison Inlet), but also in Grise Fiord area and on Cornwallis Island. Have seen females with two calves. |
| Gjoa Haven, Kugaaruk | Recognized the importance and the difficulties to survey Peary caribou: hard to see in the winter time, they mix with Dolphin and Union caribou and other caribou in the southern part of their range, and surveys are very expensive. |
| Gjoa Haven | Gjoa Haven community members stated that they were not very concerned about Peary caribou because Peary caribou are hardly ever seen there |

2013 Community Meetings:

- Ekaluktutiak Hunters and Trappers Association Meeting & Cambridge Bay Public Meeting February 26, 2013
- Gjoa Haven Hunters and Trappers Association Meeting February 28, 2013
- Iviq Hunters and Trappers Association & Grise Fiord Public Meeting February 20, 2013
- Resolute Bay HTO & Resolute Bay Community Meeting February 19, 2013
- Spence Bay HTO Meeting February 27, 2013

| Community | Comment |
|---|---|
| **Have you seen changes in the number of Peary caribou in your area?** | |
| Cambridge Bay | The members of the board and the community say that they are seeing more Peary caribou now than they did before but not in large numbers. |
| Gjoa Haven | Members have always seen Peary caribou on Prince of Wales Island when they went there. They have also seen tracks on the ice of Peary caribou coming and going from the island suggesting that they do not stay there all the time. They don't travel there often enough to know how the numbers of caribou there have changed. |
| Grise Fiord (Public Meeting) | Wildlife, if they will be harvested, they tend to increase; if they are not harvested they tend to decrease. This is a known fact. Peary caribou have been harvested for years and years, and she is glad to say there are still some caribou around. It's the same thing with vegetation, that when we are happy and grateful for it, the vegetation tends to increase. |
| Grise Fiord (Public Meeting) | It's important that we don't allow the population of Peary caribou to get too large because that's not good for them either. Some years there are more and some years there are fewer; it is the natural cycle. The community has seen that happen with polar bears. |
| Resolute Bay | Even when there are no more caribou on an island or in an area, they always return. |
| Resolute Bay | One director described that when he was a child, there were no more caribou so they had to move from Somerset Island to where there were more caribou on Prince of Wales Island. Because the caribou were their only source of material for clothing and food, they had to relocate to the mainland. Sometime later, two people went back to Somerset Island to see if the caribou had returned and found caribou, so they could go back to their homeland and were able to supply themselves with clothes and food again. |
| Resolute Bay | There was a time when there were so many caribou that they were too plentiful. When the population of caribou gets too high there is disease and sickness among them because of the overpopulation. This was after the government people came to the north. |
| Resolute Bay | There is always growth in wildlife. |
| Resolute Bay | If there are any Peary caribou, they will always return, even if they are not flown in by planes by the federal government. |
| Resolute Bay | The people are glad that Peary caribou are coming back to their area. |

| | |
|---|---|
| Resolute Bay | One director said he had no worry that the caribou will disappear. Sometimes it seems that Peary caribou have disappeared, but they always come back. Endangered in Inuktitut means “there are almost no more”. It is saying that they are disappearing. But they are coming back, they are recovering. |
| Resolute Bay | The caribou are recovering, we know that for sure, they are coming back and they are calving. When people travel to Bathurst Island, they see lots of calves and caribou there. |
| Resolute Bay (Public Meeting) | Overpopulation of Peary caribou is a problem as well. Peary caribou are dying off as a result, this should be taken into consideration too. The Resolute Bay Peary caribou population right now is just right. Not a threat right now but could be at some point. When the populations are high they tend to go to areas of contamination. |
| Resolute Bay (Public Meeting) | One HTO Director explained that in 1959 there were plenty of Peary caribou and the hunters would go caribou hunting by dogteam to Bathurst Island and Somerset Island. They didn’t go to Somerset Island too much because it was a long trip and there were plenty of caribou. There were also lots of caribou on Cornwallis Island. Since the people lived there all that time they would watch to see how the animals were doing. |
| Resolute Bay (Public Meeting) | One HTO director told of a time when the Peary caribou died off from the areas around the community – there were three sets [different times] of die offs. After the first time, according to Simon’s father, the caribou were going to die off again. When Idlout’s father was brought here from Iglulik, what they prophesized came true - the Peary caribou left this place and went back to their former land. Simon’s late father and my uncle said when they went back to Fort Ross, they went to study the land and they said we can return to our former camp because they liked the fur and the meat of the caribou, because they knew about the caribou. They always harvested the caribou for the meat and the fur. They were able to see caribou even on the sea ice. Areas that didn’t have caribou before even had caribou now. But they said that the caribou are going to die off again and it snowed heavily, the caribou died off from starvation. There were also diseases. The caribou even went to Victoria Island. They preferred the island caribou [Peary caribou] over the caribou from the mainland. They said the caribou will return again because they’ve been here before. Whatever kind of animal has been here will return. I bring this up because this Peary caribou being considered a species at risk is something we are not happy about |
| **Did you traditionally hunt Peary caribou? If so, have you changed your hunting practices because of a change in the number of Peary caribou in your area? Do you still hunt Peary caribou?** | |
| Cambridge Bay | Board members and community members stated that they do not generally hunt Peary caribou as there are other caribou around in larger numbers. However they also state that Peary caribou is a preferable meat because it is fattier and more tender. |
| Gjoa Haven | Members stated that they hunt Peary caribou when they can because they are a delicacy for them. They have to travel far to find them so they don’t hunt them regularly. |
| Grise Fiord | When Inuit go hunting you want to catch enough caribou to last and it takes 2-3 weeks. It is faster for hunters to travel on the land when it is warmer. |

| | |
|---|---|
| Resolute Bay HTO | Hunters have recently been able to hunt Peary caribou again. In February 2012, hunters harvested caribou and the community was able to have a community feast. |
| Resolute Bay (Public Meeting) | In 1973/1974, Prime Minister Jean Chretien was the Minister of DIAND and the community wrote to him and told him they wanted to control their own Peary caribou and the government agreed to allow this. The HTO told their community members not to harvest Peary caribou. Much later the caribou were seen all over again and they were told they could harvest two caribou. The community followed their own laws. Years later they were told that they could harvest 13 caribou and this made the community much happier. The community now knows that the caribou are now plenty enough to harvest. |
| Resolute Bay (Public Meeting) | The HTO chair stated that they are conservationists, they don't want to see the caribou die off. In the past the HTO has put their own restrictions on harvest into place. The HTO could use that same model if the caribou decrease again. |
| Taloyoak | Members of the HTO stated that traditionally the people of Taloyoak relied on marine mammals for food but now they rely mostly on caribou. |
| **Question: Have you noticed changes in where you see Peary caribou in your local area?** | |
| Grise Fiord | Peary caribou have moved onto other places where there is activity happening on the land (exploration/coal/research) and that is a concern for the community. |
| Taloyoak | Members of the community and the HTO felt that they are seeing Peary caribou closer to their community than they have before. |
| **General Comments** | |
| Gjoa Haven | The general consensus from the board members is that the animals feed off the land and they will travel to different areas in search of better feeding grounds. They do not believe that the species is becoming extinct or that the population is declining, they feel that the animals are just moving based on their needs. |
| Grise Fiord | The Iviq HTO Chair welcomed everyone and said he appreciates that we are here to help, not to restrict their harvest. Right now there is depletion of caribou and the HTO are aware of this. |
| Taloyoak | The general consensus from the board members and community members (in all three Kitikmeot communities) is that the animals feed off the land and they will travel to different areas in search of better feeding grounds. They do not believe that the species is becoming extinct or that the population is declining, they feel that the animals are just moving based on their needs. |
| Taloyoak | Community members feel that we should not try to manage the caribou populations, that they will manage themselves through natural processes. |

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Canadian Wildlife Service
Environment and Climate Change Canada
PO Box 2310 – 5019 – 52nd Street
Yellowknife NT X1A 2P7

13 June 2017

RE: Proposed Listing of **Peary Caribou** under the federal Species at Risk Act as a Threatened species

The purpose of this package is to share information and get your feedback on the proposed listing of Peary Caribou as a Threatened species under the federal *Species at Risk Act* (SARA).

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) completed the assessment of Peary Caribou in November 2015 as a Threatened species. Peary Caribou was previously assessed by COSEWIC in May 2004 as an Endangered species.

Peary Caribou were listed as Endangered under the federal SARA in 2011, and a recovery strategy is required for species listed as Endangered or Threatened. The Canadian Wildlife Service is currently developing a draft recovery strategy for Peary Caribou, working cooperatively with co-management partners within the range of the caribou. The proposed downlisting of Peary Caribou from Endangered to Threatened will not impact the document drafting process, as a recovery strategy is required for both listings.

You are invited to submit comments on the potential impacts of amending the List of Wildlife Species at Risk according to this COSEWIC status assessment. Your comments will be considered and will inform the federal Minister's recommendation.

We are sending you a questionnaire about the proposed listing of Peary Caribou.

For more information, a consultation booklet is available for download at:
http://sararegistry.gc.ca/document/default_e.cfm?documentID=2972

The COSEWIC status and assessment report is available for download at:
http://sararegistry.gc.ca/document/default_e.cfm?documentID=494

We hope you will review the information in this package. If you have any additional questions, concerns or information that you feel should be considered in the listing decision, please let us know and we will follow up with you as needed. If you feel this package provides enough information for you to make a decision, please respond in writing to the Canadian Wildlife Service telling us



Canada

your formal position on the proposed listing of Peary Caribou as a Threatened species. You can either send us a letter or you can fill in the attached questionnaire.

There will also be an opportunity to provide comments during the 30-day public consultation period associated with pre-publication in Canada Gazette Part I.

We request your response by **August 31, 2017.**

Please send your comments or questions to:
Dawn Andrews, Species at Risk Biologist
Canadian Wildlife Service
P.O. Box 2310
Yellowknife, NT X1A 2P7
Phone: 867-669-4767
Fax: 867-873-6776
Email: dawn.andrews@canada.ca

Yours sincerely,

B. MacDonald

Bruce MacDonald
Regional Director | Directeur regional
Canadian Wildlife Service | Service canadien de la faune
Northern Region | Région du Nord
Environment and Climate Change Canada | Environnement et Changement climatique Canada
5019 - 52nd Street, 4th Floor | 5019 - 52é rue, 4è étage
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Government of Canada | Gouvernement du Canada
Website | Site Web: www.ec.gc.ca

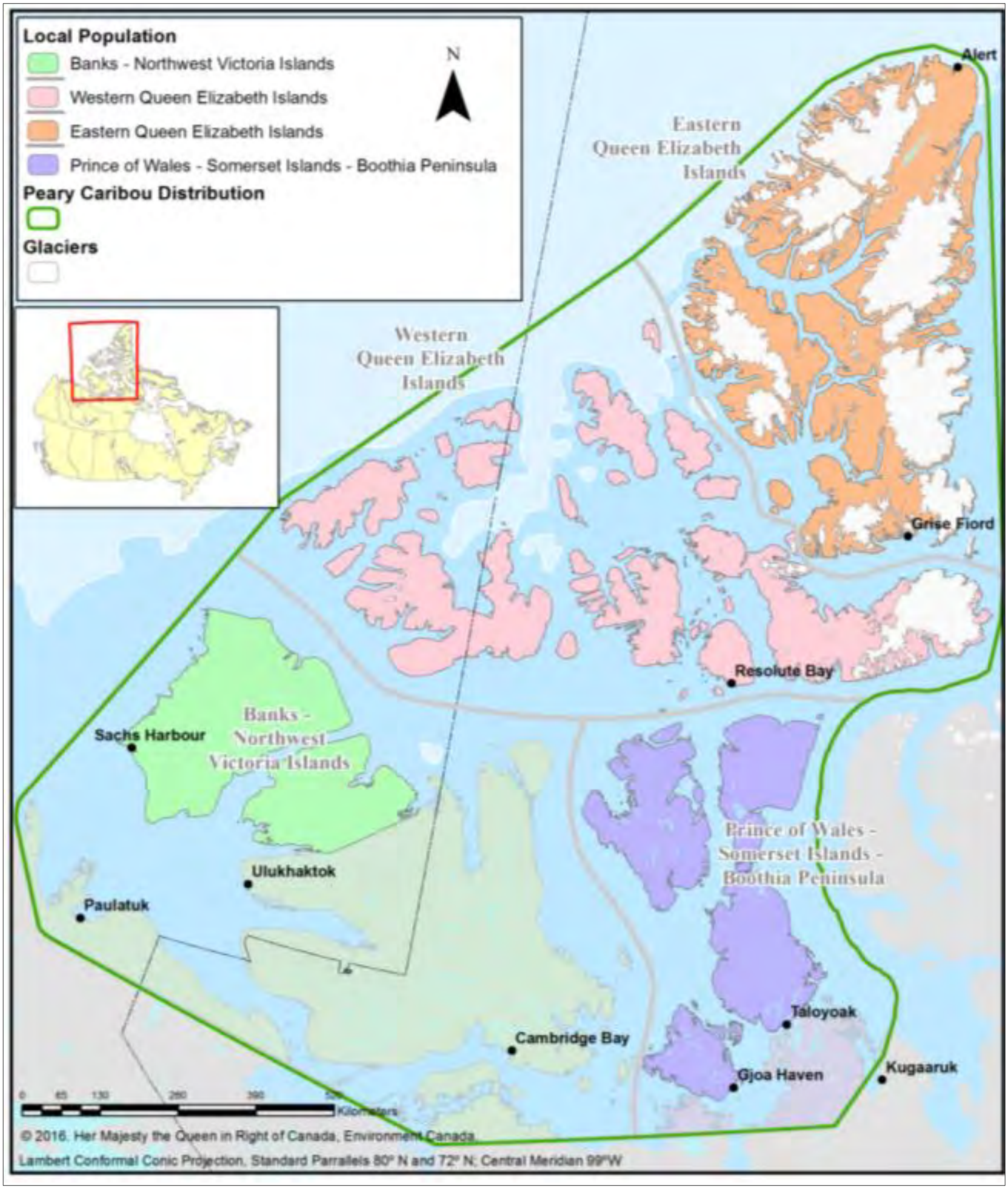


**Figure 1. Distribution of Peary Caribou, divided into four local populations found in core areas.**

**COSEWIC Wildlife Species Assessments, November 2015**

http://www.cosewic.gc.ca/

**Peary Caribou** | *Rangifer tarandus pearyi*

**Status:** Threatened

**Last Examination and Change:** May 2004 (Downlisting)

**Canadian Occurrence:** NT, NU

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**Reason for Designation:** This subspecies of caribou is endemic to the Canadian Arctic Archipelago, living on the edge of plant growth in polar desert and arctic tundra environments. The current population is estimated at 13,200 mature individuals. From a population high of 22,000 in 1987, the species experienced a catastrophic die-off in the mid-1990s related to severe icing events in some parts of its range. The population was ca. 5,400 mature individuals in 1996, the lowest since surveys first commenced in 1961. Of four subpopulations, two are currently showing an increasing trend, one is stable, and the fourth had fewer than 10 individuals at the last count in 2005, with no evidence of any recovery. The overall population has experienced an estimated three-generation decline of 35%, but has been increasing over the past two decades. The highest-impact threats derive from a changing climate, including increased intensity and frequency of rain-on-snow events negatively affecting forage accessibility in winter, and decreased extent and thickness of sea ice causing shifts in migration and movement patterns.

**Status History:** The original designation considered a single unit that included Peary Caribou, *Rangifer tarandus pearyi*, and what is now known as the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. It was assigned a status of Threatened in April 1979. Split to allow designation of three separate populations in 1991: Banks Island (Endangered), High Arctic (Endangered) and Low Arctic (Threatened) populations. In May 2004 all three population designations were de-activated, and the Peary Caribou was assessed separately from the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. The subspecies *pearyi* is composed of a portion of the former “Low Arctic population”, and all of the former “High Arctic” and “Banks Island” populations, and it was designated Endangered in May 2004. Status re-examined and designated Threatened in November 2015.

Please fax this form to 867-873-6776
Or email to
ec.sarnt-lepnt.ec@canada.ca
by August 31, 2017

Environment and Climate Change Canada / Environnement et Changement climatique Canada

# Peary Caribou

## Proposed downlisting from Endangered to Threatened

**The following questions are intended to assist you in providing comments. They are not limiting and any other comments you may have are welcome. We also encourage you to share descriptions and estimates of costs and benefits where possible.**

**Questionnaire filled out by:**

______________________________
(Print name / title)

**Organization:**

______________________________

**Date questionnaire completed:**

______________________________

**Have you seen Peary Caribou in your area?** ☐ Yes ☐ No

**Do you have enough information to make a decision on your position/opinion on the proposed listing of Peary Caribou as Threatened under the federal *Species at Risk Act*?**

☐ Yes ☐ No *If you need more information, someone will contact you to see how best to provide this information*

**What is your organization's position/opinion on the proposed listing of Peary Caribou as Threatened?**

☐ Support the proposed listing of Peary Caribou as Threatened
☐ Do not support the proposed listing of Peary Caribou as Threatened
☐ Indifferent to the proposed listing of Peary Caribou as Threatened

**What are your reasons for this position?**




Canada

**Please fax this form to 867-873-6776**
**Or email to**
**ec.sarnt-lepnt.ec@canada.ca**
**by August 31, 2017**

**Do you have any additional comments?**

Some points to consider:

- Do you think adding the species to the SARA List would have an impact on your activities?
- Might any of your activities have an impact on this species?
    - If yes, to improve management of this species, would you be willing to avoid or adjust your activities to lessen their impact? What would the implications of any such adjustments to your activities?
- Do you think that listing the species would have economic benefits or costs to you, your community, or your organization?
- Do you think that listing the species would have any benefits or costs to the environment or ecosystem?
- Do you think that listing the species would have cultural or social benefits or costs for you, your community or your organization?
- Do you have any other information or concerns that the federal Minister of the Environment and Climate Change should consider before making a decision on the listing of the species




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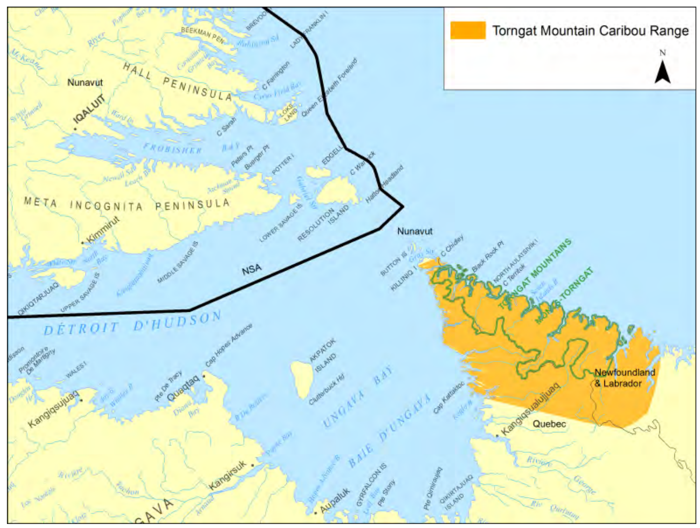
Environment and Climate Change Canada | Environnement et Changement climatique Canada

Submission to the Nunavut Wildlife Management Board

For

Information: **Decision: X**

**Issue**: Pre-listing consultations for the Caribou (Torngat Mountains population) as Endangered under the federal *Species at Risk Act* (SARA)


**Background**:

- The Torngat Mountains population of Caribou was assessed as Endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2016.
- The coat of the Torngat Mountains population is almost white in the winter, but medium to light brown in the summer. These caribou are medium-sized and have long legs.
- COSEWIC's reason for designation: This population is restricted to the Ungava Peninsula of eastern Québec, northern Labrador, and Nunavut (Killiniq and adjacent islands). A quantitative trend is not available because survey data are limited, but the total population was estimated to be 5,000 individuals in 1980 and 930 individuals in 2014, suggesting a significant decline. Aboriginal Traditional Knowledge also indicates a decline.

- The population meets Endangered status because the estimated 698 mature animals exist in a single population, a population decline is evident, and a decline is predicted to continue because of harvest and a decrease in habitat quality associated with climate change. The population may be facing imminent extinction because of the low numbers remaining.
- In October 2017, COSEWIC submitted its assessment of the species to the Minister of the Environment. The Minister of the Environment will respond within 90 days, by posting a response on the SARA Public Registry. The response statement will indicate the scope of the consultation and timelines.
- Environment and Climate Change Canada (ECCC) will consult with the appropriate Minister(s), wildlife management boards and Indigenous organizations on changes to the List of Wildlife Species at Risk (Schedule 1) of the *Species at Risk Act* for terrestrial species.
- For species that are listed as Endangered, a recovery strategy is to be prepared within one year of the species' addition to Schedule 1 and added to the Species at Risk Registry. Recovery strategies are prepared in cooperation with the jurisdictions, wildlife management boards, and Indigenous organizations.
- If the Torngat Mountains population is listed under the federal *Species at Risk Act* a national recovery strategy will be written that identifies the threats to the species and its habitat, and sets population and distribution objectives for the survival and recovery of the species. The national recovery strategy will identify critical habitat to the extent possible. After critical habitat is identified, ECCC will work with partners to find the best method to protect the habitat from activities that would destroy it.
- Prohibitions against killing or harming the Torngat Mountains population will automatically come into force if the species is listed. In the territories, these automatic prohibitions only apply on federal lands that are under the authority of the Minister of the Environment or the Parks Canada Agency, such as National Parks and National Wildlife Areas. As well, these automatic prohibitions do not apply to people engaging in activities in accordance with conservation measures under a land claims agreement.
- Based on the range of the Torngat Mountains population, it is unclear to ECCC if community consultations should occur in Nunavut.
- ECCC colleagues in the Atlantic Region as well as Quebec Region will consult with partners in their respective areas.

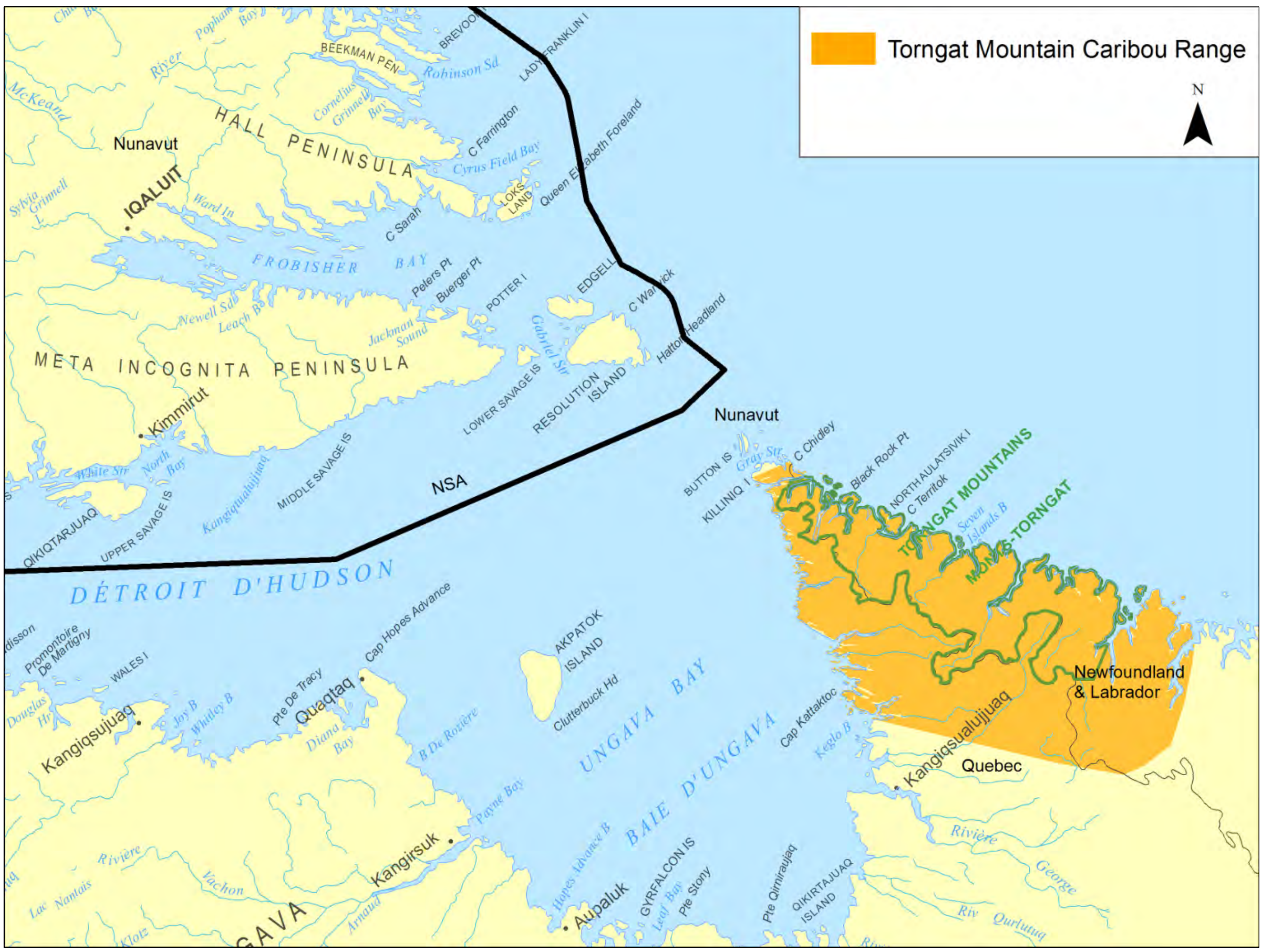
**Next Steps - Consultation Process:**

- Jurisdictions and wildlife management boards, including the NWMB and the Government of Nunavut, will be asked to review and provide input into the draft Terrestrial Issues Flagging (TIF) document, which outlines the species' current status, presence on the landscape, projected impact of listing, and issues flagged. This process helps inform the decision on the consultation timeline – normal or extended.
- It is expected that consultations on the proposed listing will start in January 2018.

**Request of the NWMB:**

That the NWMB considers whether it wishes to be consulted on the proposed listing of Caribou (Torngat Mountains population) and subsequently make a decision on approving the listing of Caribou (Torngat Mountains population) under the federal *Species at Risk Act*, or if the NWMB will choose to not perform its decision making function under section 5.2.34(f) of the *Nunavut Land Claims Agreement* with respect to Caribou (Torngat Mountains population).

That if the NWMB decides to exercise its decision making function on Caribou (Torngat Mountains population) that the NWMB considers whether or not community consultations should occur in Nunavut, and if so which communities ECCC should contact.




Caribou (Torngat Mountains population) – Range

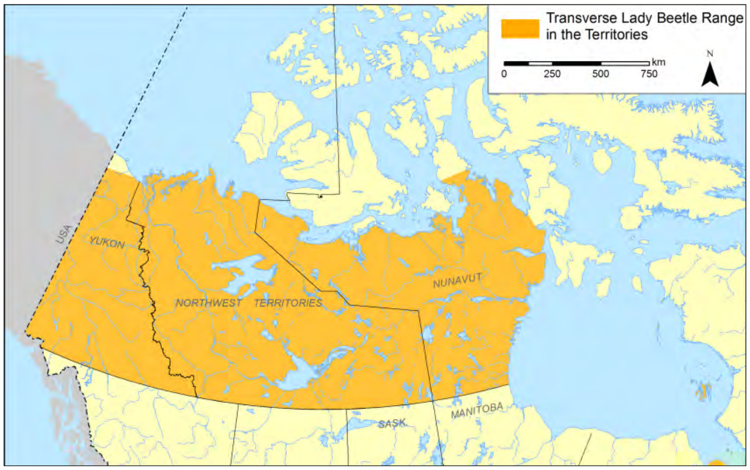
Prepared by: Amy Ganton, Species at Risk Biologist
Canadian Wildlife Service, Yellowknife, NT
Phone: 867-669-4710
Date Drafted: 2017-Nov-03

Submission to the Nunavut Wildlife Management Board

For

Information: **Decision: X**

**Issue**: Pre-listing consultations for the Transverse Lady Beetle as a species of Special Concern under the federal *Species at Risk Act* (SARA)


**Background**:

- The Transverse Lady Beetle was assessed as a species of Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2016.
- The Transverse Lady Beetle is a small, round beetle and adults have orange to red wing covers. Wing covers have black markings consisting of one black band and four elongated spots.
- COSEWIC's reason for designation: this species was once common and broadly distributed throughout most of Canada. Declines started in the 1970s and the species is now absent in southern Ontario and the Maritimes. In some parts of its western and northern range, the species is still commonly recorded. The spread of non-native lady beetles is considered one of the possible threats to this species through competition, predation on potential competitors, or introduction of pathogens. Non-native lady beetles are less commonly found in places where this species remains.

- There are no records of this species that currently exist in Nunavut, but it is possible the species occurs in Nunavut given how widespread it is found in the Yukon and Northwest Territories. The available map information for Nunavut is based on a historical range map by R. D. Gordon in 1985. The COSEWIC report suggests one record was available near Taloyoak, but the records were collected between 1899-2015 and the record is not mentioned by COSEWIC in the text.
- In October 2017, COSEWIC submitted its assessment of the species to the Minister of the Environment. The Minister of the Environment will respond within 90 days, by posting a response on the SARA Public Registry. The response statement will indicate the scope of the consultation and timelines.
- Environment and Climate Change Canada (ECCC) will consult with the appropriate Minister(s), wildlife management boards and Indigenous organizations on changes to the List of Wildlife Species at Risk (Schedule 1) of the *Species at Risk Act* for terrestrial species.
- For species that are listed as Special Concern, a management plan is to be prepared within three years of the species' addition to Schedule 1 and added to the Species at Risk Registry. Management plans are prepared in cooperation with jurisdictions, wildlife management boards, and Indigenous organizations.
- While immediate protection under SARA for species listed as Extirpated, Endangered and Threatened do not apply to species listed as Special Concern, any existing protections and prohibitions continue to be in force.
- Based on the historical range of the Transverse Lady Beetle, it is unclear to ECCC if community consultations should occur in Nunavut.

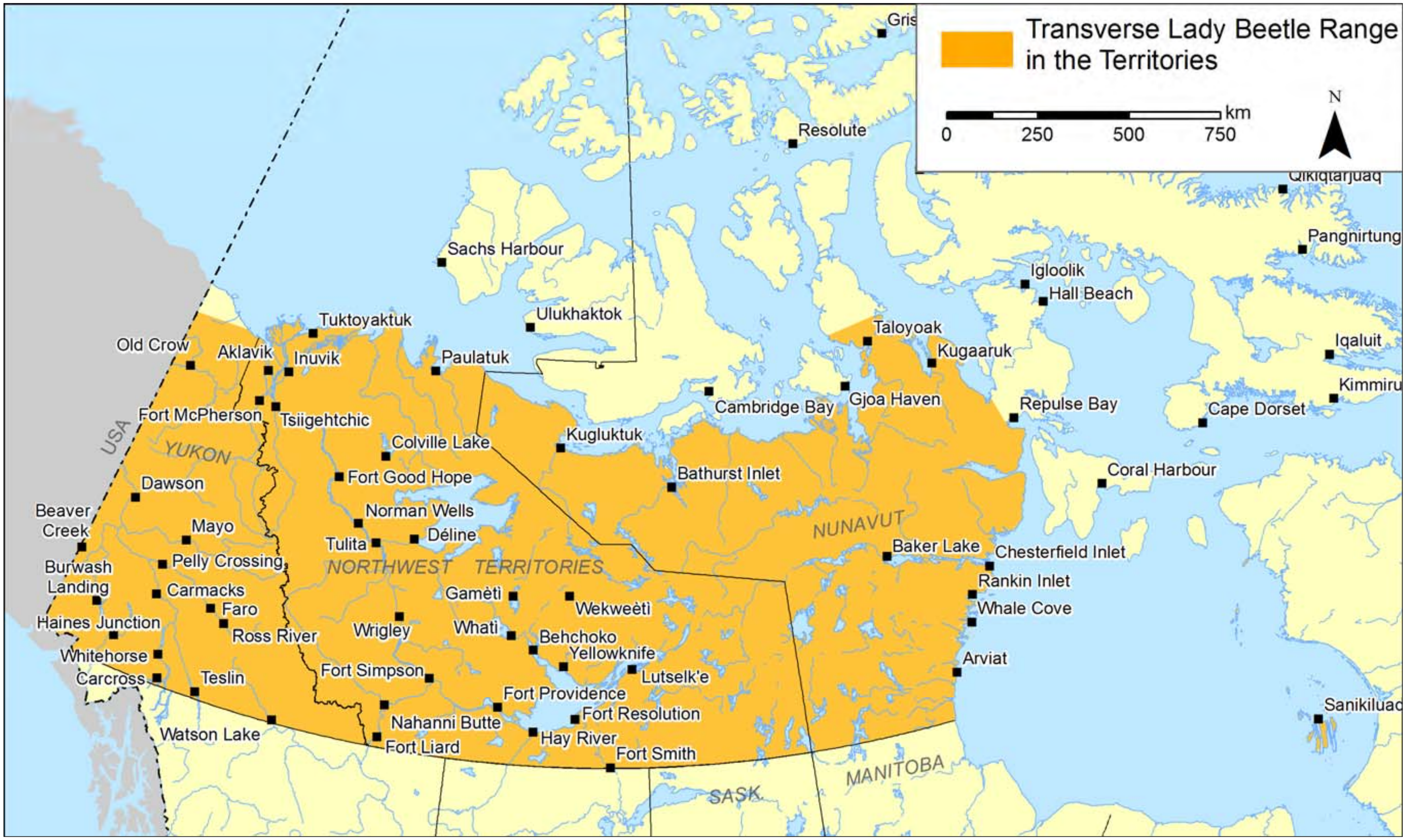
**Next Steps - Consultation Process:**

- Jurisdictions and wildlife management boards, including the NWMB and the Government of Nunavut, will be asked to review and provide input into the draft Terrestrial Issues Flagging (TIF) document, which outlines the species' current status, presence on the landscape, projected impact of listing, and issues flagged. This process helps inform the decision on the consultation timeline – normal or extended.
- It is expected that consultations on the proposed listing will start in January 2018.

**Request of the NWMB:**

That the NWMB considers whether it wishes to be consulted on the proposed listing of the Transverse Lady Beetle and subsequently make a decision on approving the listing of the Transverse Lady Beetle under the federal *Species at Risk Act*, or if the NWMB will choose to not perform its decision making function under section 5.2.34(f) of the *Nunavut Land Claims Agreement* with respect to the Transverse Lady Beetle.

That if the NWMB decides to exercise its decision making function on the Transverse Lady Beetle that the NWMB considers whether or not community consultations should occur in Nunavut, and if so which communities ECCC should contact. Potential communities include: Kugluktuk, Bay Chimo, Bathurst Inlet, Gjoa Haven, Taloyoak, Kugaaruk, Repulse Bay, Baker Lake, Chesterfield Inlet, Rankin Inlet, Whale Cove, Arviat, and Sanikiluaq.




Transverse Lady Beetle – Range

Prepared by: Amy Ganton, Species at Risk Biologist
Canadian Wildlife Service, Yellowknife, NT
Phone: 867-669-4710
Date Drafted: 2017-Nov-03

Environment and Climate Change Canada / Environnement et Changement climatique Canada

Submission to the Nunavut Wildlife Management Board

For

**Information: X** Decision:

**Issue**: Pre-listing consultations for the Barren-ground Caribou as Threatened under the federal *Species at Risk Act* (SARA)



**Background**:

- Barren-ground caribou was assessed as Threatened by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in November 2016.
- Barren-ground caribou are medium-sized and have longer legs than Peary caribou and Dolphin and Union caribou, but shorter legs than Boreal caribou. They have dark brown legs, backs and antler velvet, with a distinctive brown and white coat pattern in the fall.
- COSEWIC's reason for designation: Most of the Barren-ground caribou herds have declined dramatically. Overall, the decline is estimated at 56% over the past three generations. The Porcupine caribou herd is one of the few exceptions to this trend and is increasing. There are currently 800,000 Barren-ground caribou, down from over 2 million in the early 1990s.
- A number of threats are thought to be causing the decline, such as climate and weather changes that are affecting forage availability, predation, parasites and diseases. Some others are Industrial exploration and development, fragmentation of habitat in their winter range from forest fires and increasing human presence, as well as subsistence and sport harvests that are a significant cause of mortality.



Canada

- The decline of Barren-ground caribou is so drastic that it could have been assessed as Endangered. However, COSEWIC recommended the Threatened status in recognition of the numerous management actions that are being initiated by governments, wildlife management boards and communities, and because Barren-ground caribou do not appear to be facing imminent extinction at this time.
- In October 2017, COSEWIC submitted its assessment of the species to the Minister of the Environment. The Minister of the Environment will respond within 90 days, by posting a response on the SARA Public Registry. The response statement will indicate the scope of the consultation and timelines.
- Environment and Climate Change Canada (ECCC) will consult with the appropriate Minister(s), wildlife management boards and Indigenous organizations on changes to the List of Wildlife Species at Risk (Schedule 1) of the *Species at Risk Act* for terrestrial species.
- For species that are listed as Threatened, a recovery strategy is to be prepared within two years of the species' addition to Schedule 1 and added to the Species at Risk Registry. Recovery strategies are prepared in cooperation with the jurisdictions, wildlife management boards, and Indigenous organizations.
- If Barren-ground caribou are listed under the federal *Species at Risk Act* a national recovery strategy will be written that identifies the threats to the species and its habitat, and sets population and distribution objectives for the survival and recovery of the species. The national recovery strategy will identify critical habitat to the extent possible. After critical habitat is identified, CWS will work with partners to find the best method to protect the habitat from activities that would destroy it.
- Prohibitions against killing or harming Barren-ground caribou will automatically come into force if the species is listed. In the territories, these automatic prohibitions only apply on federal lands that are under the authority of the Minister of the Environment or the Parks Canada Agency, such as National Parks and National Wildlife Areas. As well, these automatic prohibitions do not apply to people engaging in activities in accordance with conservation measures under a land claims agreement.

**Next Steps - Consultation Process:**

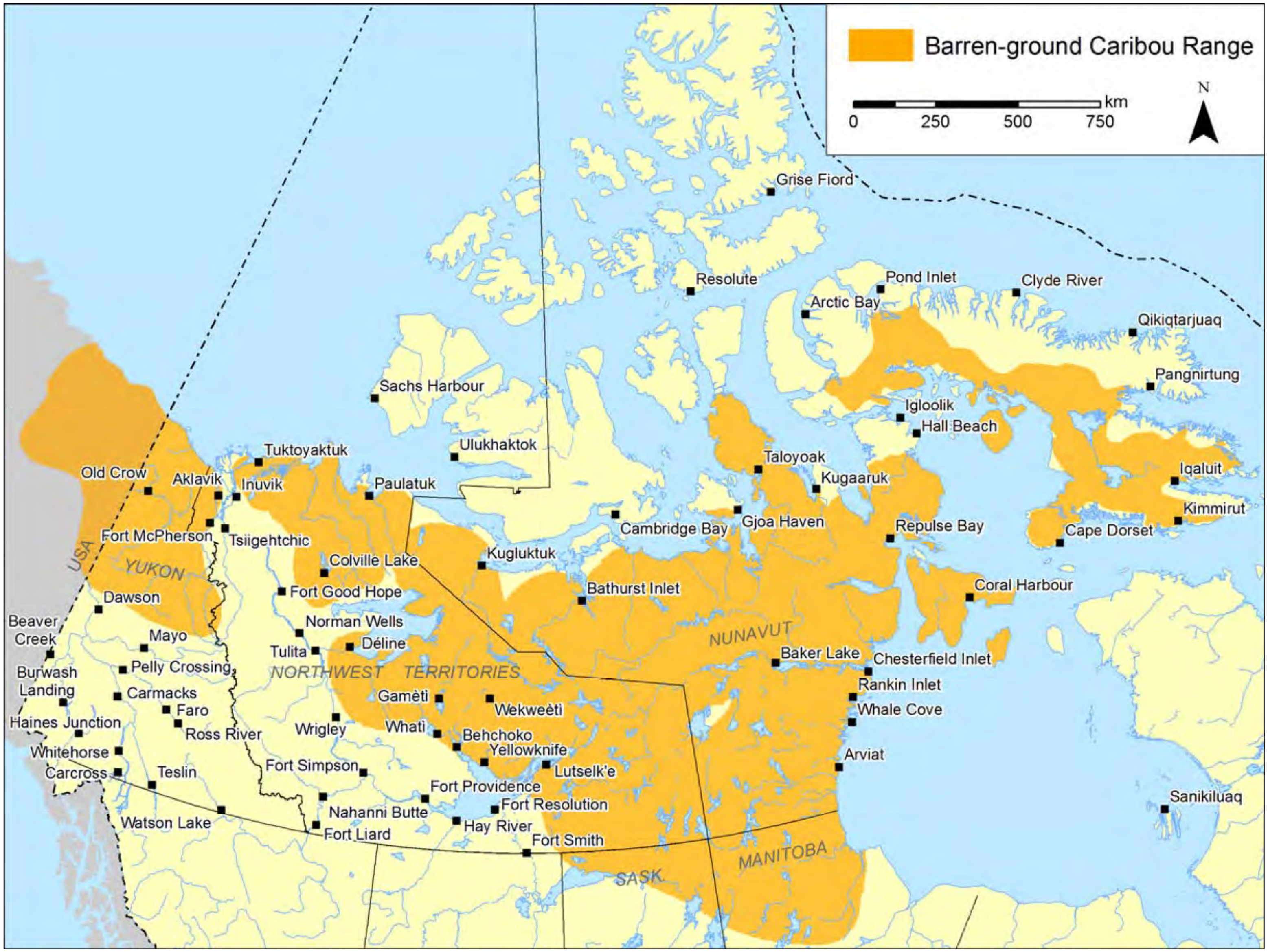
- Jurisdictions and wildlife management boards, including the NWMB and the Government of Nunavut, will be asked to review and provide input into the draft Terrestrial Issues Flagging (TIF) document, which outlines the species' current status, presence on the landscape, projected impact of listing, and issues flagged. This process helps inform the decision on the consultation timeline – normal or extended.
- It is expected that consultations on the proposed listing will be held between January and October 2018. Organizations such as hunters and trappers organizations (HTOs) and regional wildlife boards are asked to provide their formal position on the proposed listing (i.e. oppose, support or are indifferent) and with any other comments, concerns or information that they feel should be considered. ECCC will ask partners to provide feedback by April 30, 2018 in order for ECCC to follow up on any outstanding questionnaires or participation in meetings by October 2018.
- Given the range of the species, CWS plans to consult all Nunavut communities with the exception of Grise Fiord and Resolute Bay.
- Consultation packages, in Inuktitut and English, will be sent by mail and email, include: a letter, a PowerPoint, and a questionnaire. The full COSEWIC Assessment and Status Report will be provided in digital format in English only.
- To support consultations, CWS will extend an offer to provide more information, if requested, in the best means possible, including attending a board meeting by teleconference or in-person. A reminder email and

follow-up phone calls, to the extent possible, will be done to seek input from as many organizations as possible.

- Following consultations, CWS will summarize the consultation results and present them to the Board at the next quarterly meeting following the consultation period and seek NWMB's decision on the proposed listing of the species.

**Request of the NWMB:**

- That the NWMB provide Environment and Climate Change Canada with any feedback on the consultation process to obtain input and a decision on support from Hunters and Trappers Organizations for the proposed listing of Barren-ground Caribou as Threatened under the federal *Species at Risk Act*.




Barren-ground Caribou – Range

Prepared by: Amy Ganton, Species at Risk Biologist
Canadian Wildlife Service, Yellowknife, NT
Phone: 867-669-4710
Date Drafted: 2017-Nov-03

# SUBMISSION TO THE
# NUNAVUT WILDLIFE MANAGEMENT BOARD
**FOR**

**Information:** **Decision: X**

**Issue:** Approval of the Ukkusiksalik Nation Park of Canada – Management Plan and associated prohibition of sport fishing by park visitors in water bodies with associated commercial char fishing quotas.

**Background:**
Ukkusiksalik National Park (Figure 1) stretches inland from the northwestern shore of Hudson Bay, encompassing the waters of Wager Bay and the lands that surround it. Inuit from the communities of Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat (formerly known as Repulse Bay), and Rankin Inlet maintain ties to the land with Inuit from Naujaat and Coral Harbour having the closest historic ties to the Park (Map 1). "Ukkusiksalik", an Inuktitut term, means "place where there is stone to carve pots and oil lamps". The park encompasses an area of 20 885 km$^2$ and is among the ten largest national parks in the country. The park was established in 2003 and is jointly managed by Inuit and Parks Canada in accordance with the *Nunavut Agreement,* the *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada,* and the *Canada National Parks Act,* its associated regulations and policies.

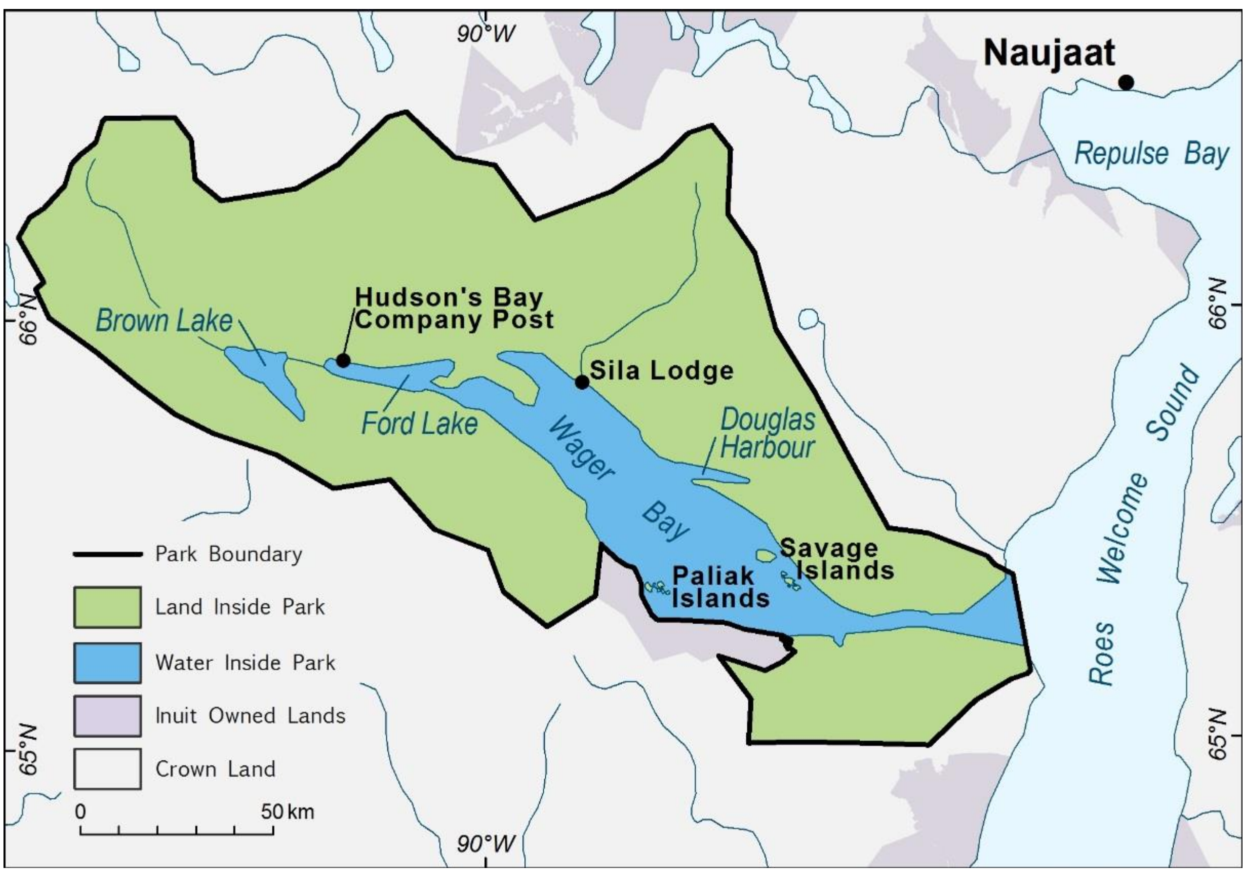
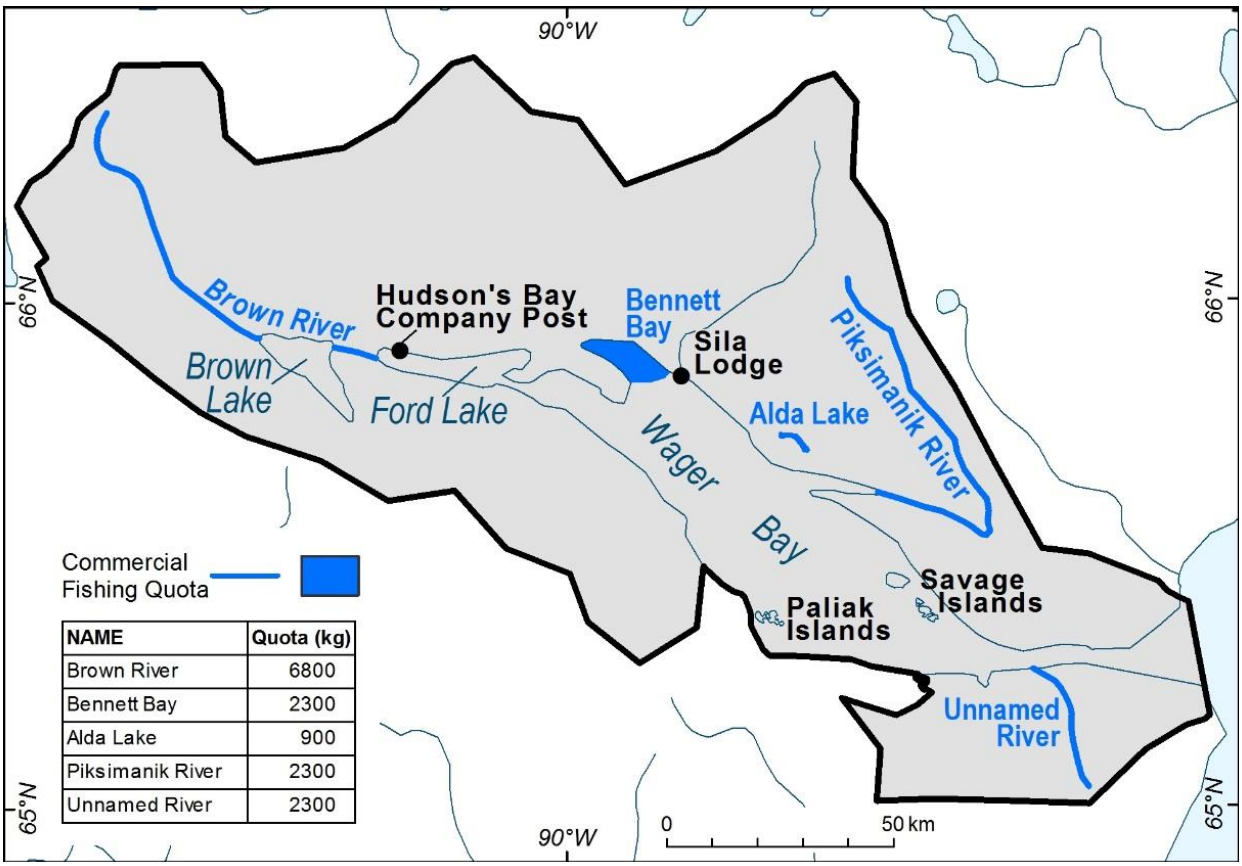



Figure 1: Ukkusiksalik National Park of Canada

Parks Canada also recommends the NWMB approve the prohibition of sport fishing by non-Inuit park visitors in areas with current commercial char fishing quotas (see Figure 2 for water body names and associated quotas).

Recreational angling within Ukkusiksalik National Park will be authorized under a Parks Canada fishing permit; however, these authorizations will not be made until the *National Parks of Canada Fishing Regulations* (C.R.C., c.1120) are updated to include Ukkusaksalik National Park. Following the updating of the regulations, Parks Canada will seek the NWMB's approval for possible restrictions on catch and possession limits per person per day.




| NAME | Quota (kg) |
|---|---|
| Brown River | 6800 |
| Bennett Bay | 2300 |
| Alda Lake | 900 |
| Piksimanik River | 2300 |
| Unnamed River | 2300 |

Figure 2: Commercial char fishing quotas within the boundary of Ukkusiksalik National Park of Canada (Unnamed River is also referred to as Middle Bay).

**Prepared by:**
Peter Kydd
Resource Conservation Manager, Parks Canada – Nunavut Field Unit
(867) 975-4660

**Date:** October 27, 2017

**Attachments:**
Ukkusiksalik National Park of Canada – Management Plan
Consultation Summary – May 2017

# Ukkusiksalik National Park of Canada Management Plan Overview

Nunavut Wildlife Management Board – Regular Meeting
December 5, 2017

NWMB RM 004-2017 0313

# Context

- First management plan, draft developed by the Park Planning Team, with support from Parks Canada.
- Draft plan was developed with input from adjacent communities and partners
- Local and regional consultation in November 2016 and May 2017
- UPMC approval of consultation summary May 25, 2017
- Draft document reviewed by Parks Canada and posted online for public comment September 2017
- UPMC approval of Management Plan October 18, 2017
- Next steps (review and approval):
  - Nunavut Wildlife Management Board
  - Kivallik Inuit Association
  - Minister/Chief Executive Officer
  - Tabled in Parliament

# Overview of Plan

1. Introduction
2. Significance of Ukkusiksalik National Park
3. Planning context
4. Vision
5. Strategies
    - Objectives
        - Targets
6. Zoning
7. Summary of strategic environmental assessment

# Vision

*Ukkusiksalik National Park is a landscape alive with the stories of generations of Inuit, abundant wildlife, and striking vistas. The park is a beautiful place that feeds our imagination, our souls, and our bodies. Fully immersing oneself into the park will ensure the creation of long lasting memories, connecting you to a land that will never be described as empty and that must always remain a place to escape to.*

*Ukkusiksalik will be a place where the Inuit way of doing things: past, present, and future knowledge, experiences and values, that-is-to-say "Inuit Qaujimajatuqangit" is protected, promoted, and passed on. Families strengthen their connections to the land. Inuit elders share the skills they learned from their ancestors. Stories are brought to life and passed on as they have been passed on for generations.*

*Ukkusiksalik will continue to be managed jointly by Inuit and the Government of Canada. Management will be based on Inuit Qaujimajatuqangit and science to promote ecological integrity including healthy wildlife populations that are able to follow their natural cycles. Plants that provide food and medicine will be plentiful. Ukkusiksalik will fulfill its destiny as a northern paradise and a true Arctic wilderness for all to experience the mystery now and in perpetuity.*

# Strategies, Objectives, and Targets

Key Strategy 1: Infrastructure – Ensuring that appropriate facilities are available for protecting, promoting, and presenting Ukkusiksalik National Park

Key Strategy 2: Living Landscape – Strengthening people's connections to Ukkusiksalik National Park

Key Strategy 3: Gathering Knowledge – Collecting scientific information and Inuit Qaujimajatuqangit (Inuit knowledge) to help protect, present, and promote Ukkusiksalik National Park's natural and cultural resources

# Objective 3.2:
# Scientific information and Inuit Qaujimajatuqangit are being used to inform and support long term management decisions

## Targets for Objective 3.2:

1. A framework for the Ukkusiksalik Inuit Knowledge Working Group guiding how Inuit Qaujimajatuqangit can provide input into management decisions will be developed within two years of approval of this plan.
2. Collect, record, and share Inuit Qaujimajatuqangit and elders' stories about Ukkusiksalik National Park.
3. An outreach program targeting researchers with the goal of encouraging future research is developed and implemented within three years.
4. Research priorities are reviewed with input from the UPMC within two years.
5. Information on caribou, polar bear, and raptor populations is updated before the next State of the Park Assessment in collaboration with other agencies and Inuit knowledge holders to identify ecologically and biologically sensitive areas in the park.
6. Information to implement the fishing prohibition in Article 10.8 of the IIBA is collected to correspond with the enactment of the updated *National Parks of Canada Fishing Regulations*.

# Zoning

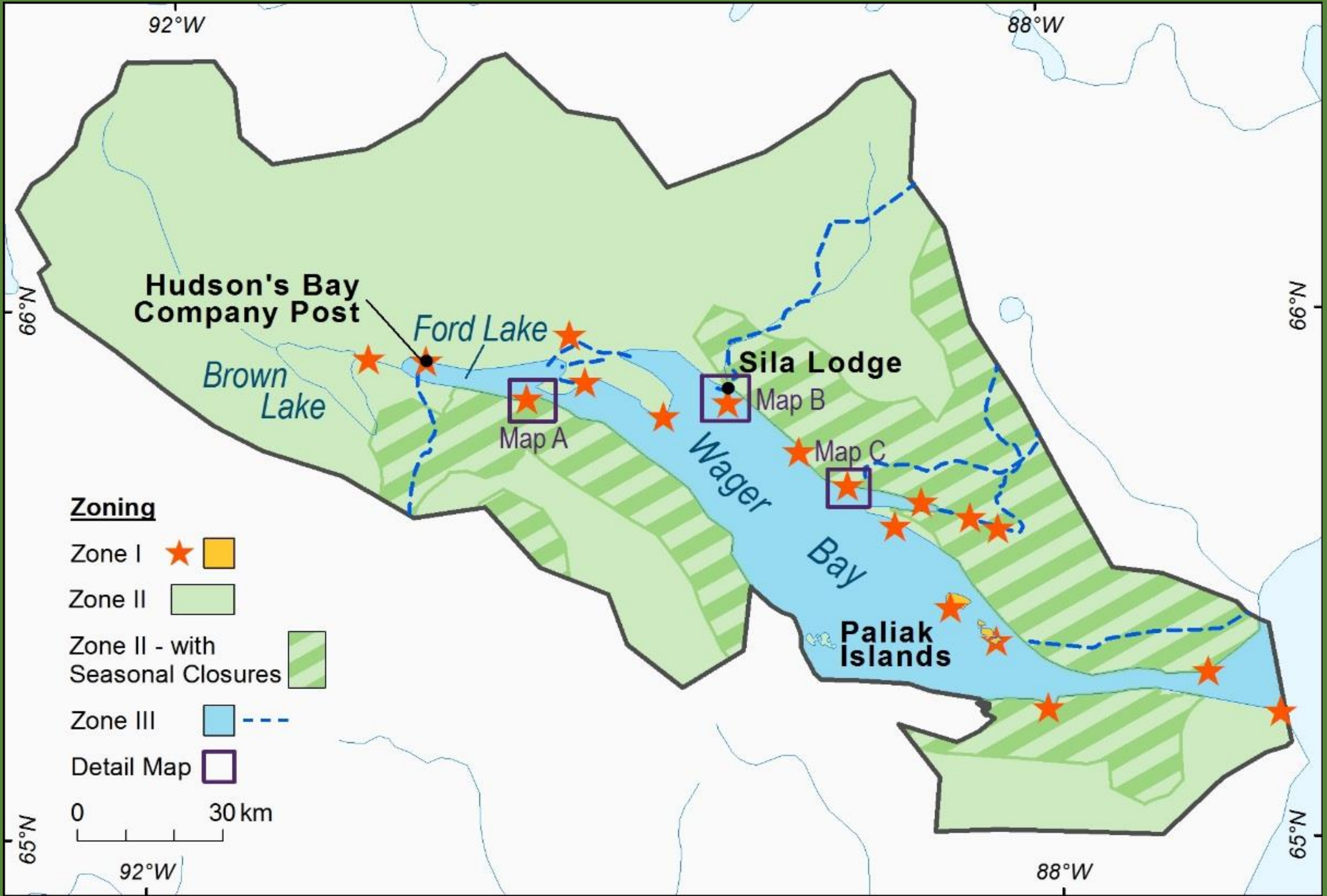
ZONE I: SPECIAL PRESERVATION require special protection because they contain or support unique, sensitive, threatened or endangered natural or cultural heritage features, or are among the best examples of the features of the natural region represented by the park. Visitation to Zone I sites may be authorized under carefully controlled and monitored conditions. Motorized access is not permitted, except for strictly controlled motorized access for research and park operation activities authorized by Parks Canada.

ZONE II – WILDERNESS contains extensive areas that are good representations of a natural region and are conserved in a wilderness state. The perpetuation of ecosystems with minimal human interference is the key consideration. Zone II areas offer opportunities for visitors to experience firsthand the park's ecosystems and require few, if any, rudimentary services and facilities. In much of Zone II, visitors have the opportunity to experience remoteness and solitude. Motorized access is not permitted except strictly controlled motorized access for research, park operations and outreach and education activities relating to the park that are authorized by Parks Canada and are consistent with Parks Canada regulations and policy.

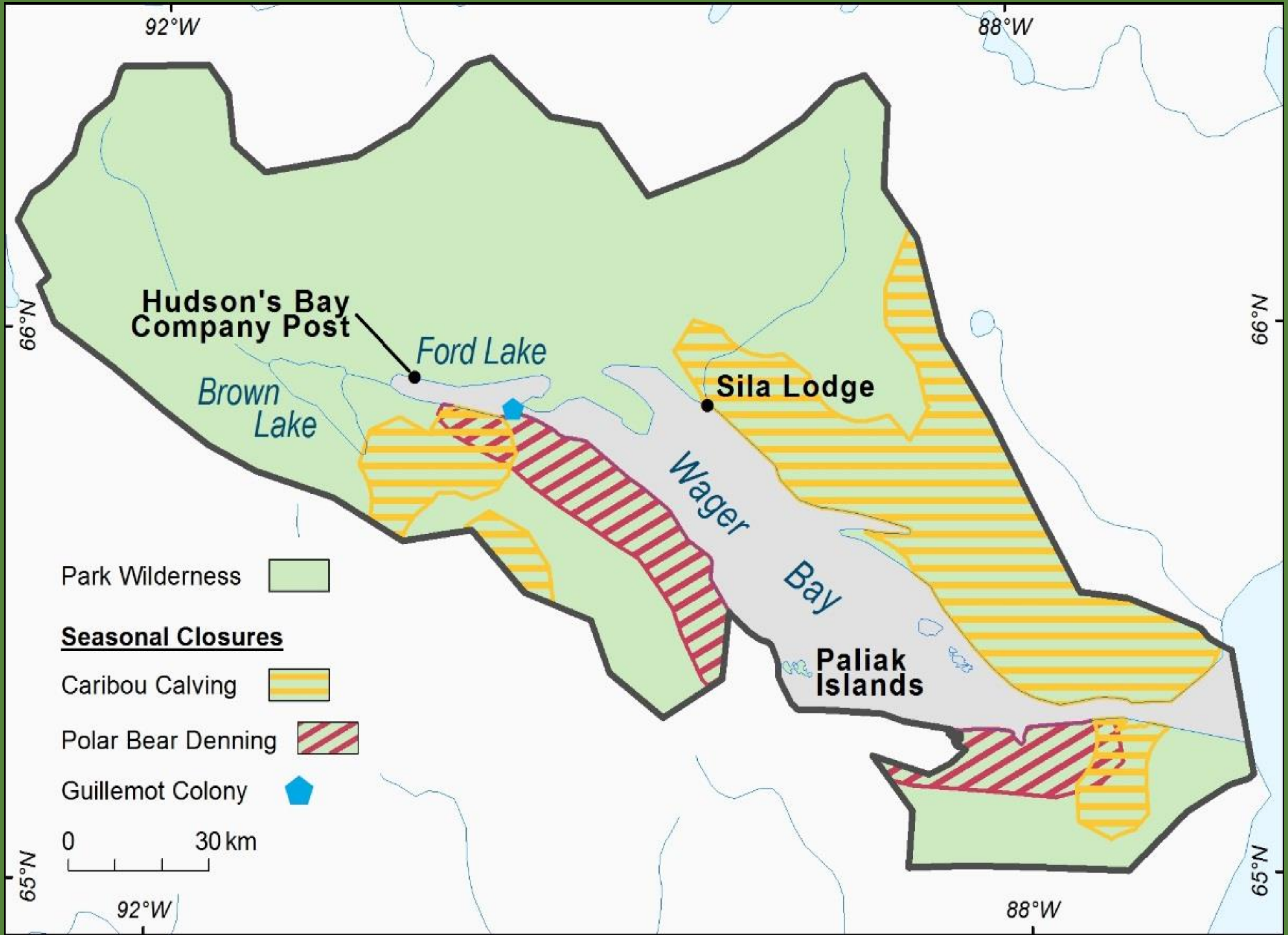
ZONE III – NATURAL ENVIRONMENT visitors can discover the park's natural and cultural heritage through recreational activities that require a few rustic services and facilities. Motorized access will be permitted to specific, controlled areas only.

AREAS OF SPECIAL IMPORTANCE The intent of designating a portion of a national park as an Area of Special Importance to Inuit is to maintain its character for Inuit who may still use those areas as they have done historically prior to the establishment of the park and in recognition of Schedule 6-1 of the Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada which states that "Inuit are an integral part of the ecosystem".

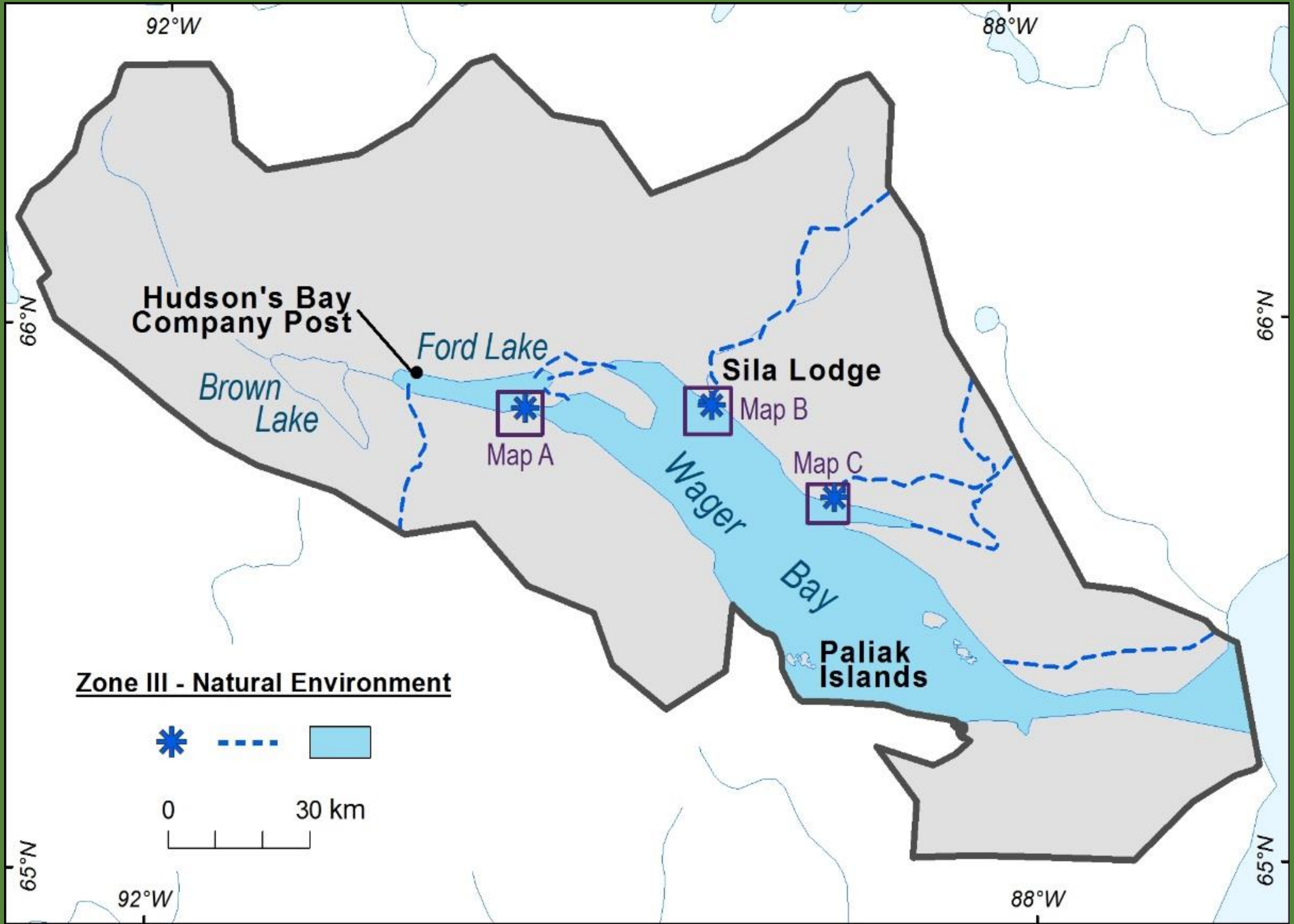
# Overview of Zones



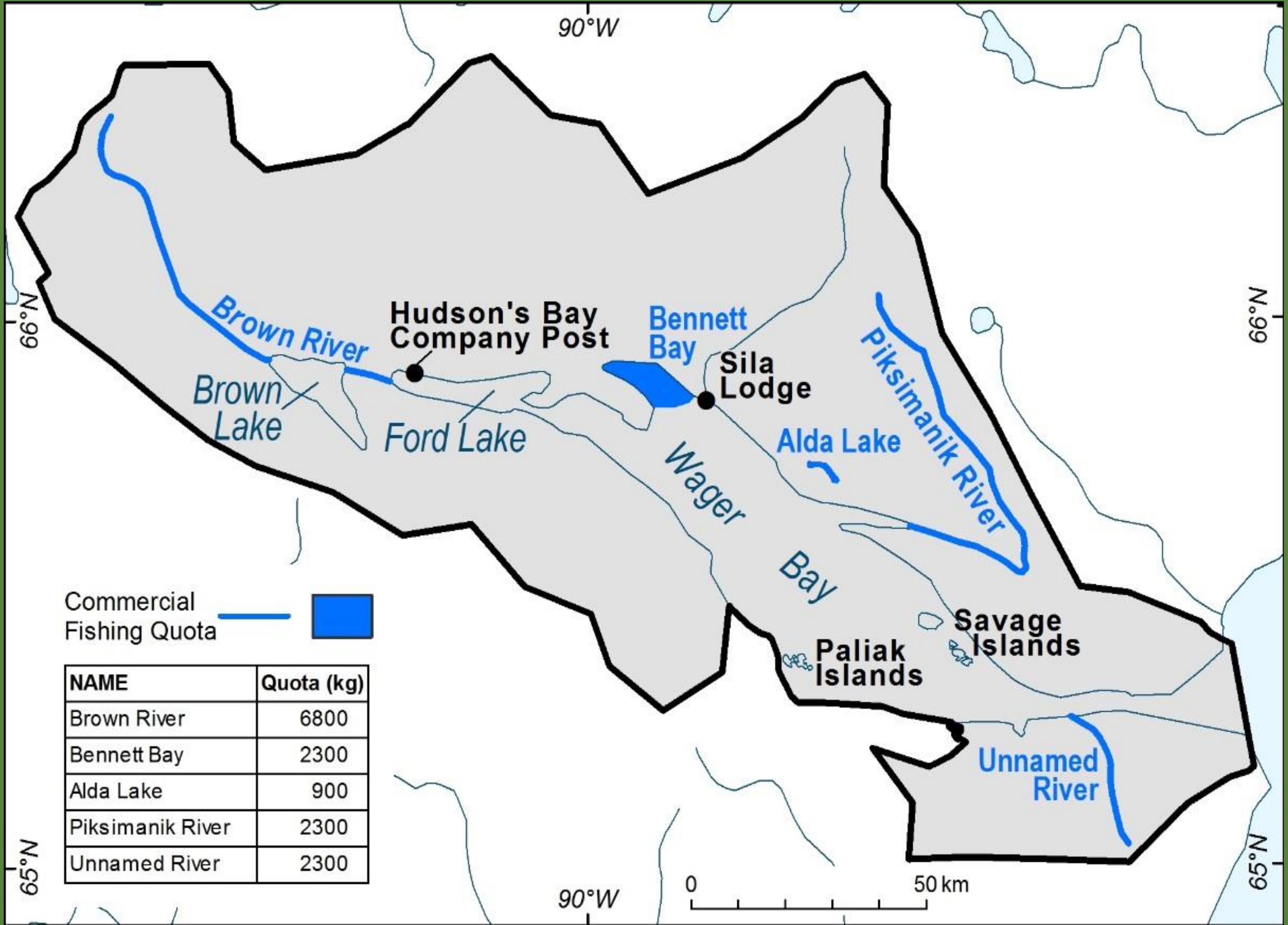
# Zone II and Seasonal Closures



# Zone III


92°W
88°W
66°N
65°N
Hudson's Bay Company Post
Ford Lake
Brown Lake
Sila Lodge
Map A
Map B
Map C
Wager Bay
Paliak Islands
Zone III - Natural Environment
0
30 km

# Fishing: Commercial Quotas




| NAME | Quota (kg) |
|---|---|
| Brown River | 6800 |
| Bennett Bay | 2300 |
| Alda Lake | 900 |
| Piksimanik River | 2300 |
| Unnamed River | 2300 |

# Strategic Environmental Assessment

*There are no important negative environmental effects anticipated from implementation of the Ukkusiksalik National Park Management Plan.*

# Thank you!

**Ukkusiksalik Park Planning Team**

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- Elizabeth Aglukka, Ukkusiksalik Joint Park Management Committee
- John Tatty, Ukkusiksalik Joint Park Management Committee
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**Ukkusiksalik Joint Park Management Committee**

- Donat Milortok, Naujaat
- Elizabeth Aglukka, Naujaat
- Jackie Nakoolak, Chair, Coral Harbour
- Joan Scottie, Baker Lake
- John Tatty, Rankin Inlet
- Larry Tautu, Chesterfield Inlet

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- Elizabeth Kidlapik, Hunters and Trappers Organization
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Parks Canada Parcs Canada

Canada

# Ukkusiksalik

National Park of Canada

**Management Plan**

2017

# Ukkusiksalik
## National Park of Canada

## Draft Management Plan

# Note to Readers

This document makes references to articles of the 1993 *Agreement Between the Inuit of the Nunavut Settlement Area and Her Majesty The Queen In Right of Canada* (Nunavut Agreement) and the 2003 *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada* (IIBA). These documents provide a frame of reference and outline obligations for cooperative management of National Parks in Nunavut. It is recommended that readers familiarize themselves with these documents to fully understand the context for managing Ukkusiksalik National Park. Copies of both documents can be obtained by contacting Parks Canada or the Kivalliq Inuit Association.

# Executive Summary

Ukkusiksalik National Park stretches inland from the northwestern shore of Hudson Bay, encompassing the waters of Wager Bay and the lands that surround it. Inuit from the communities of Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat (formerly known as Repulse Bay), and Rankin Inlet maintain ties to the land with Inuit from Naujaat and Coral Harbour having the closest historic ties to the Park (Map 1). “Ukkusiksalik”, an Inuktitut term, means “place where there is stone to carve pots and oil lamps”. The park encompasses an area of 20 885 km$^2$ and is among the ten largest national parks in the country. The park was established in 2003 and is jointly managed by Inuit and Parks Canada in accordance with the *Nunavut Agreement,* the *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada,* and the *Canada National Parks Act,* its associated regulations and policies.

This management plan has been developed to enable implementation of specific articles in the IIBA while protecting, promoting and presenting natural and cultural heritage that is of national significance. The management plan, and the key strategies contained within, will be used as a tool for Inuit and the Government of Canada to manage Ukkusiksalik cooperatively, for the next ten years. Working with Inuit from the park’s adjacent communities is central to these strategies. Each key strategy builds on previous accomplishments in ways that enable Parks Canada to better carry out its mandate and enables the park’s adjacent communities to benefit from the presence of a national park.

KEY STRATEGY 1: INFRASTRUCTURE - Ensuring appropriate facilities are available for protection, presentation, and promotion of Ukkusiksalik National Park

Developing infrastructure and transmitting information to park users (Inuit, staff and visitors) are important for management.

KEY STRATEGY 2: LIVING LANDSCAPE - Strengthening people’s connections to Ukkusiksalik National Park

The strong connection of Inuit to the land, the importance of Inuit stories, and presenting and promoting the Park are encapsulated in this strategy.

KEY STRATEGY 3: GATHERING KNOWLEDGE - Collecting scientific information and Inuit Qaujimajatuqangit in support of protecting, presenting, and promoting Ukkusiksalik National Park’s natural and cultural resources

Collecting scientific information and Inuit Qaujimajatuqangit to understand and manage the park are the focus of this strategy. The importance of Inuit Qaujimajatuqangit, research and monitoring is foundational for effective management.

# 1.0 Introduction

Parks Canada manages one of the finest and most extensive systems of protected natural and historic places in the world. The Agency's mandate is to protect and present these places for the benefit and enjoyment of current and future generations. Future-oriented, strategic management of each national park, national marine conservation area, heritage canal and those national historic sites administered by Parks Canada supports the Agency's vision:

> *Canada's treasured natural and historic places will be a living legacy, connecting hearts and minds to a stronger, deeper understanding of the very essence of Canada.*

This is the first management plan for Ukkusiksalik National Park. The *Canada National Parks Act* and the *Parks Canada Agency Act* require Parks Canada to prepare a management plan for each national park. The *Ukkusiksalik National Park of Canada Management Plan, 2017* will be endorsed by the Ukkusiksalik Park Management Committee (UPMC) and the Kivalliq Inuit Association and approved by the Nunavut Wildlife Management Board. Furthermore, this management plan will be approved by the Minister responsible for Parks Canada and tabled in Parliament. The process of stakeholder engagement and approvals, ensures Parks Canada's accountability to Canadians while outlining how park management will achieve measurable results in support of the Agency's mandate.

Ukkusiksalik National Park is jointly managed in accordance with the *Nunavut Agreement* and the *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada* (IIBA). The Ukkusiksalik Park Management Committee, the Nunavut Wildlife Management Board, Parks Canada staff and Inuit from the park's five adjacent communities were involved in the preparation of the management plan and thus have contributed to shaping the future direction of the national park. This plan sets clear, strategic direction for the management and operation of Ukkusiksalik National Park by articulating a vision, key strategies, objectives and targets. Parks Canada, jointly with Inuit, will report annually on progress toward achieving the plan objectives and will review the plan every ten years or sooner if required.

This plan is not an end in and of itself. Parks Canada and Inuit will cooperate to maintain an open dialogue on the implementation of the management plan, and to ensure that it remains relevant and meaningful. The plan will serve as the focus for ongoing engagement on the cooperative management of Ukkusiksalik National Park in years to come.

Map 1. Regional Setting

## 2.0 Significance of Ukkusiksalik National Park

The park was first proposed as a protected area in 1978, as part of the "6 North of 60" consultation program[1]. It was the fourth national park established in Nunavut in accordance with Part 2 of Article 8 of the *Nunavut Agreement*. The park is representative of the Central Tundra natural region[2]. Lands were reserved for a national park in 1996 around Wager Bay, a veritable inland sea which extends more than 150 kilometers inland from Roes Welcome Sound on Hudson Bay to a set of reversing falls at the mouth of Ford Lake, the location of a former Hudson's Bay Company trading post (Map 2). At 20 885 $km^2$, Ukkusiksalik is among the ten largest national parks in Canada. "Ukkusiksalik", an Inuktitut term, means "place where there is stone to carve pots and oil lamps". Soap stone is used by Inuit to construct oil lamps which ensured survival and were used for heat, light, and cooking in the harsh Arctic conditions.

The first occupants of the Wager Bay area were nomadic groups affiliated with the Pre-Dorset culture (2000 BC – 800 BC) who later evolved into the Dorset culture around 800 BC[3]. The first acknowledged inhabitants of the park were members of nomadic groups affiliated with the Thule culture which is known to have arrived in north-western Hudson Bay around 1200 AD[4]. The people living in the area until recently are known as *Aivilingmiut*[5]. The park is dotted with at least four hundred and forty-nine known cultural resources which inform our understanding of the historic cultural heritage in this area (Table 1 includes significant cultural sites).

Low tundra vegetation superimposed on the Canadian Shield dominates the landscape. Wildlife found in the park includes polar bears, grizzly bears, muskox, caribou, wolves, wolverine, Arctic fox, Arctic hare, Arctic ground squirrel, peregrine falcons, gyrfalcons, golden eagles, rough-legged hawks, snow geese, Canada geese, tundra swans, and snow buntings, among others. Wager Bay is also known for seals, beluga, and arctic char, and for impressive tides.

The park is jointly managed by Inuit and Parks Canada in accordance with the *Nunavut Agreement* and the IIBA. According to Article 2.2.of the IIBA, Ukkusiksalik National Park was established to:

- Protect a representative natural area of Canadian significance in the Central Tundra natural region so as to leave it unimpaired for future generations;
- Provide for the maintenance of vital, healthy, wildlife populations capable of sustaining Inuit harvesting needs;
- Celebrate the special historical and cultural relationship between Kivalliq Inuit and the land in the Ukkusiksalik National Park area;
- Encourage public understanding, appreciation and enjoyment of the Ukkusiksalik National Park area; and
- Recognize and honour Inuit knowledge, culture and harvesting rights and incorporate them as part of the living legacy of the park.

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[1] Parks Canada, 1980. *Report to the Minister: 6 North of 60 Parks Canada Consultation Program*. Ottawa. 10 pp

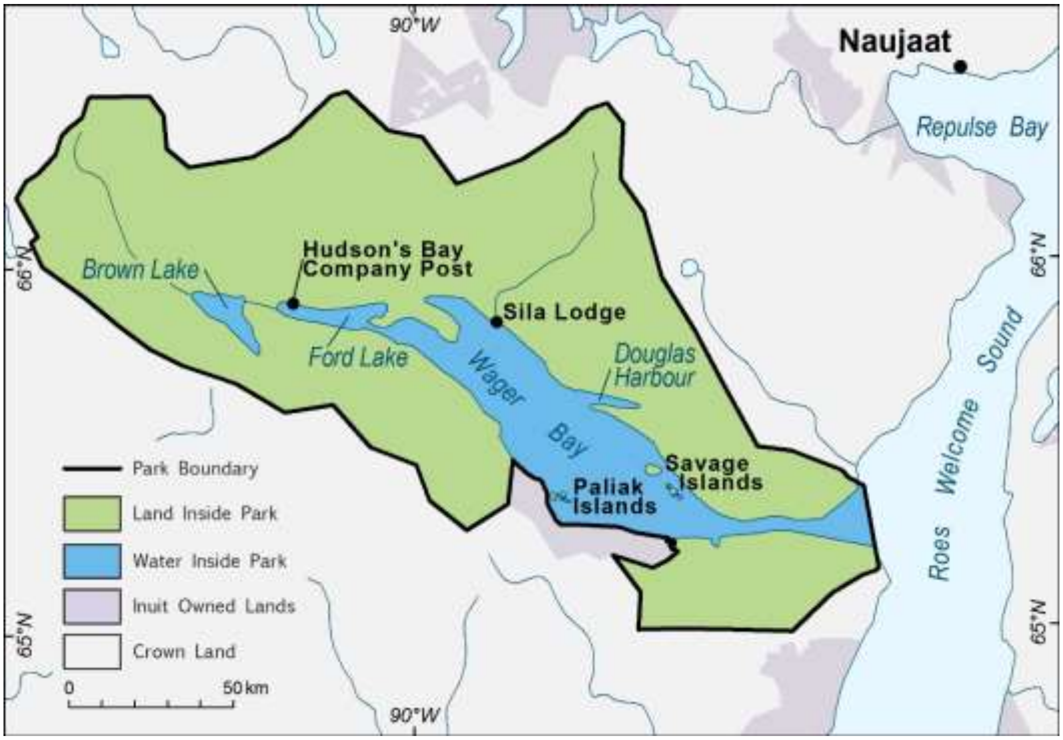
[2] Parks Canada, 1997. *National Parks System Plan, 3rd Edition. 106 pp.*

[3] McGhee, Robert. 1990. *Canadian Arctic Prehistory.* Canadian Museum of Civilization, Ottawa.

[4] Ibid.

[5] Mary-Rousselière, Guy. 1984. *"Iglulik"* in Arctic Ed. by David Damas, pp. 431-446. *Handbook of North American Indians,* Vol. 5, Smithsonian Institution, Washington.

Map 2. Ukkusiksalik National Park




# 3.0 Planning Context

The legal and administrative context of the park, broad trends that will affect the park in years to come, and perspectives of Inuit, adjacent community members, stakeholders, and other members of the public must be taken into account in management planning for the future of Ukkusiksalik National Park. Several issues and opportunities were identified in the State of the Park Assessment and pre-planning work including the challenge of current infrastructure deficiencies to support park operations and users, the opportunity for the park to play an important role in protection and promotion of Inuit culture, and the need to collect more scientific and Inuit traditional knowledge for use in park management decisions.

## 3.1 The Legal and Administrative Context of the Park

Following the negotiation and signature of the *Nunavut Agreement* and the *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada* in 2003, Ukkusiksalik National Park was established in 2014 by order in council under the *Canada National Parks Act*. The *Nunavut Agreement* defines Inuit rights and benefits and identifies cooperative management structure for national parks in the Nunavut. In particular, Articles in the agreement recognize the right of Inuit to harvest wildlife, quarry carving stone, establish outpost camps, and to enter national parks at no cost.

The *Nunavut Agreement* (Articles 8.4.11-8.4.14) and the IIBA (Article 6) define the cooperative management approach for the park. The UPMC is the cooperative management body for the park. According to Article 5.5, the role of the UPMC is to advise Parks Canada, the Minister responsible for Parks Canada, the Nunavut Wildlife

Management Board, and other agencies on all matters relating to the management of the park.

## 3.2 Early Park Development

Since 2003, many actions have been taken to establish a foundation for management. In 2007, an office and garage were constructed and staff housing units were also acquired in the community of Naujaat. Furthermore, considerable success has been made in hiring Inuit to manage the park. Several staff members have close, historic ties to the park, with one staff having been born there. A number of projects have occurred in the park including initiating cleaning up and stabilizing the former Hudson's Bay Company post on Ford Lake and completing the first year of a two year project to conduct research to gather baseline data for Wager Bay. The official opening of the park took place in early July of 2015 at the same time that the Hamlet of Naujaat formally adopted its traditional Inuktitut place name. Finally, in 2017, the first joint review of the IIBA for Ukkusiksalik was completed and the results of this review have been considered in the development of this plan.

## 3.3 The Relationship with the Park's Adjacent Communities and Tourism Opportunities

Inuit maintain a strong relationship with the land and marine environments in which they live. Inuit who live in the communities of Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, and Rankin Inlet continue to travel extensively for their way of life, including within the park. Inuit Qaujimatuqangit is vital to understanding the park's ecosystems and enhancing Inuit connections to the park.

Rankin Inlet is the Kivalliq region's largest community and is a transportation and logistics hub. In addition to government services, the mining industry has a strong presence in Rankin Inlet and across the Kivalliq region, including areas surrounding the park.

Together with the Thelon and Kazan Heritage Rivers, the park has the potential to be a major tourism attraction in the region. Since establishment, the park has seen very few visitors due to a number of factors including the remote nature of the area, the short season for tourism, and the lack of tourism operators and infrastructure in adjacent communities. A naturalist lodge operated, on the shores of Wager Bay for around fifteen years from the late 1980s to the early 2000s on lands leased from Indigenous and Northern Affairs Canada and attracted hundreds of visitors from around the world. The lodge has not operated for approximately 10 years. In order to demonstrate its long term commitment to the development of sustainable tourism, and in order to fulfill the requirements of Article 12.5 of the IIBA, Parks Canada commissioned a tourism strategy as the key to expanding visitation to the park and enhancing the benefits of the presence of the park to Inuit and Inuit businesses in the park's adjacent communities[6].

Due to the park's remote location, the cost of accessing it, and the lack of infrastructure, few non-Inuit visit the park. Current park visitation has been very low, with a total of seven visitors since the 2014-2015 fiscal year. Cruise ship visitation to Nunavut has increased steadily since 2006 and research indicates it will continue to expand, however, Wager Bay and the park have not been identified as desirable destinations for the industry. Concerns have been raised about cruise ships by the UPMC because of the dangers associated with navigating in Wager Bay and the potential to disrupt both Inuit, during traditional harvesting activities, and wildlife, including polar bears and marine

[6] Aarluk Consulting. 2015. *Inuit Tourism Strategies for the Five Communities Associated with the Ukkusiksalik National Park Inuit and Impact Benefit Agreement.* 104 pp.

mammals. Increasing high-end private sailboat, yacht, and luxury cruise ship visits indicate new niche market potential, however Wager Bay and the park will likely only remain a curiosity until more nautical information about the area is available to sailors.

Visitor access to the park by aircraft has taken place, but it has significant potential to expand visitation, especially during the ice break-up period when overland access will not be possible.

The park provides some protection for species and ecosystems, but many Arctic species such as caribou, polar bears, sea birds, and marine mammals range far beyond the boundaries of the park and are not isolated from global pressures. These pressures are changing the entire Arctic and are impacting the lives of Inuit who live there. The ecosystem monitoring program is in place to identify any changes in the integrity of the components of the park's ecosystems.

## 4.0 Vision

The vision for Ukkusiksalik National Park was developed through a workshop involving members of the UPMC, the Park Planning Team, and Parks Canada staff. This vision reflects the desired state of Ukkusiksalik National Park in 15 to 20 years.

> Ukkusiksalik National Park is a landscape alive with the stories of generations of Inuit, abundant wildlife, and striking vistas. The park is a beautiful place that feeds our imagination, our souls, and our bodies. Fully immersing oneself into the park will ensure the creation of long lasting memories, connecting you to a land that will never be described as empty and that must always remain a place to escape to.
>
> Ukkusiksalik will be a place where the Inuit way of doing things: past, present, and future knowledge, experiences and values, that-is-to-say "Inuit Qaujimajatuqangit" is protected, promoted, and passed on. Families strengthen their connections to the land. Inuit elders share the skills they learned from their ancestors. Stories are brought to life and passed on as they have been passed on for generations.
>
> Ukkusiksalik will continue to be managed jointly by Inuit and the Government of Canada. Management will be based on Inuit Qaujimajatuqangit and science to promote ecological integrity including healthy wildlife populations that are able to follow their natural cycles. Plants that provide food and medicine will be plentiful. Ukkusiksalik will fulfill its destiny as a northern paradise and a true Arctic wilderness for all to experience the mystery now and in perpetuity.

# 5.0 Key Strategies

The management of Ukkusiksalik National Park takes the form of three key strategies, each with a set of corresponding objectives and targets. Objectives are mutually supportive and address the needs of a new national park to be better known, valued, and enjoyed by Canadians and by visitors from around the world while building a relationship between Parks Canada and Inuit of Baker Lake, Chesterfield Inlet, Coral Harbour, Naujaat, and Rankin Inlet.

## Key Strategy 1: Infrastructure – Ensuring that appropriate facilities are available for protecting, promoting, and presenting Ukkusiksalik National Park

Ukkusiksalik is located in a beautiful, but unforgiving landscape. The abundance of polar bears and severe weather conditions dictate that those who visit or work in the park must have hard-sided shelters available to them. Furthermore, the remote nature of the park warrants a base of operations for park staff to fulfill their duties. By implementing this management strategy, facilities will be designed and constructed or secured to fulfil the needs of multiple user groups and ensure safety.

Parks Canada will work with stakeholders and partners to design and construct or secure facilities which benefit Inuit, visitors, researchers and other agencies, and park staff while minimizing the impacts to the park's natural and cultural features. Green infrastructures will be considered.

The strategy addresses the following priorities and IIBA commitments:

- Developing hard-sided shelters to ensure the safety of all park users (Article 10.1), and
- Developing and providing safety information for park visitors and users in several of the park's adjacent communities (Article 9.3.5).

### Objective 1.1: A base of operations and hard-sided shelters are available in the park

#### Targets

1. A plan to determine the vision and requirements for a base of operations for the park, identifying infrastructure and asset needs, including the need for and availability of hard-sided shelters, is completed within two years.
2. The infrastructure development plan is ready to be implemented within four years, depending on location, size, complexity, and features of the structures.
3. Hard-sided shelters are available for park users and visitors within eight years dependent on size, complexity, integration with existing structures, and features of the structures. Priority locations may include, but are not limited to: near the site of the Hudson's Bay Company post, in Douglas Harbour, in the area of Sila Lodge and east of the reversing falls at Iglujuarnaq.

### Objective 1.2: Access routes and points, safe harbours, sensitive sites, and other features are identified and communicated to park users

Targets
1. Access routes, landing sites, safe harbours, emergency shelters, equipment caches, sensitive sites, and other features of interest are identified within two years to support visitor experience development and delivery and for educational and promotional purposes. New, pertinent information will be incorporated into these products as required.
2. Displays are installed in Baker Lake, Naujaat, and Rankin Inlet to promote the park, inform park users and provide interpretation products in accordance with Article 9.3.5 of IIBA.

## Key Strategy 2: Living Landscape – Strengthening people's connections to Ukkusiksalik National Park

This strategy focuses on recognizing historic and existing connections between Inuit and the park. The historic connections people have to the Wager Bay area is a critical part of the story of Ukkusiksalik National Park to be told.

The strategy addresses the following priorities and IIBA commitments:

- Develop Ukkusiksalik National Park's visitor experience (Article 2.2.4, 2.8, 9, and 10)
- Respect Inuit harvesting and cultural activities while balancing visitor experience (Article 1.1.2, and Article 3)
- Promote Ukkusiksalik National Park as a major attraction in the region, across the territory, and nationally (Article 9)

### Objective 2.1: Inuit connections to Ukkusiksalik National Park are strengthened and shared

Targets:
1. Deliver outreach programs in two communities annually.
2. Create opportunities for Inuit to use the park area and to share Inuit Qaujimajatuqangit.
3. Develop and deliver outreach programs or products encouraging land stewardship for the park's adjacent communities.
4. Create at least one student position within one year and staffed annually by students from one of the park's adjacent communities.
5. Strengthen the capacity of UPMC through mentoring and the delivery of training opportunities during each member's mandate.
6. Develop an annual patrol for park monitoring and asset condition assessment with a task schedule within one year, and the first patrol is implemented beginning in the spring following the approval of the plan.

### Objective 2.2: Opportunities for park visitors to experience the landscape and hear the stories of Ukkusiksalik National Park

Targets:

1. Interpretive products or experiences are developed to tell the story of Ukkusiksalik National Park's important cultural sites including but not limited to the Hudson's Bay Company post, and Ak&ungitautitalik (rope game site) within five years.
2. Site specific standards and mitigation measures for visitors are developed and communicated to park users for the park's important cultural sites within two years.
3. Wildlife viewing guidelines are developed and communicated to park users within two years.
4. An online digital tool to promote and present the park through virtual visits is launched within the first four years.
5. Three in-park visitor experience opportunities developed, as information is gathered from all sources, including Inuit Qaujimajatuqangit, Inuit Knowledge Working Group and science, and implemented within the ten year scope of this management plan.

## Key Strategy 3: Gathering Knowledge – Collecting scientific information and Inuit Qaujimajatuqangit (Inuit knowledge) to help protect, present, and promote Ukkusiksalik National Park's natural and cultural resources

This strategy prioritizes the collection of scientific and Inuit Qaujimajatuqangit in order to understand, protect and promote the cultural and natural heritage values of Ukkusiksalik. This information will be used to establish benchmarks for the long term monitoring of natural and cultural resources in the park, and to better share the park's stories.

The strategy addresses the following priorities and Inuit Impact and Benefit Agreement commitments:

- Protect the park's environment and provide for the maintenance of vital, healthy, wildlife populations capable of sustaining Inuit harvesting needs (Article 2.2)
- Protect historical and archaeological resources of the park (Article 7)
- Promote and conduct research in the park (Article 8)
- Clean up the site of and stabilize the Hudson's Bay Company Post for use in the interpretation of the park's stories (Article 12.6.4)

### Objective 3.1: Scientific information and Inuit Qaujimajatuqangit are collected to determine the current health of Ukkusiksalik National Park's ecosystems and to detect changes in the future

Targets:

1. Establish and implement a marine ecosystem monitoring program within three years.
2. Establish and implement a terrestrial (tundra) ecosystem monitoring program within three years.
3. Complete baseline data collection, within seven years, to aid in future follow-up program related to the potential effects on the ecosystems of industrial development in areas adjacent to the park.
4. Include at least one Inuit knowledge measure in the monitoring program.

### Objective 3.2: Scientific information and Inuit Qaujimajatuqangit are being used to inform and support long term management decisions

Targets:

1. A framework for the Ukkusiksalik Inuit Knowledge Working Group guiding how Inuit Qaujimajatuqangit can provide input into management decisions will be developed within two years of approval of this plan.
2. Continue to collect, record, and share Inuit Qaujimajatuqangit and elders' stories about Ukkusiksalik National Park.
3. An outreach program targeting researchers with the goal of encouraging future research is developed and implemented within three years.
4. Research priorities are reviewed with input from the UPMC within two years.
5. Information on caribou, polar bear, and raptor populations is updated before the next State of the Park Assessment in collaboration with other agencies and Inuit knowledge holders to identify ecologically and biologically sensitive areas in the park.
6. Information to implement the fishing prohibition in Article 10.8 of the IIBA is collected to correspond with the enactment of the updated *National Parks of Canada Fishing Regulations*.

### Objective 3.3: Progress has been made towards identifying and protecting the cultural resources that tell Ukkusiksalik National Park's story

Targets:

1. The Hudson's Bay Company post stabilization and development of an interpretive program in accordance with Article 12.4.6 of the IIBA is fully implemented within five years.
2. A monitoring program for any of the park's cultural resources deemed at threat is created and implemented within five years.
3. Progress is made to continue detailed inventories of important cultural sites based on information gathered from traditional knowledge holders. (E.g. five sites during the life of this plan).
4. Increase knowledge of traditional travel routes and Inuktitut place names for the park within 7 years.

# 6.0 Zoning and Areas of Special Importance to Inuit

## 6.1 Zoning

Parks Canada's national park zoning system is an integrated approach to the classification of land and water areas in a national park and designates where particular activities can occur on land or water based on the ability of those areas to support those uses. The zoning system has five categories:

| | |
|---|---|
| Zone I | Special Preservation; |
| Zone II | Wilderness; |
| Zone III | Natural Environnent; |
| Zone IV | Outdoor Recreation; and |
| Zone V | Park Services. |

Ukkusiksalik National park has three zoning classifications including zones I, II, and III (Map 3). The *Nunavut Agreement* requires that national parks in the Nunavut Settlement Area predominantly consist of Zone I and II areas. The zoning system does not apply to resource harvesting activities and subsistence use by Inuit when these activities are being carried in accordance with the *Nunavut Agreement*.

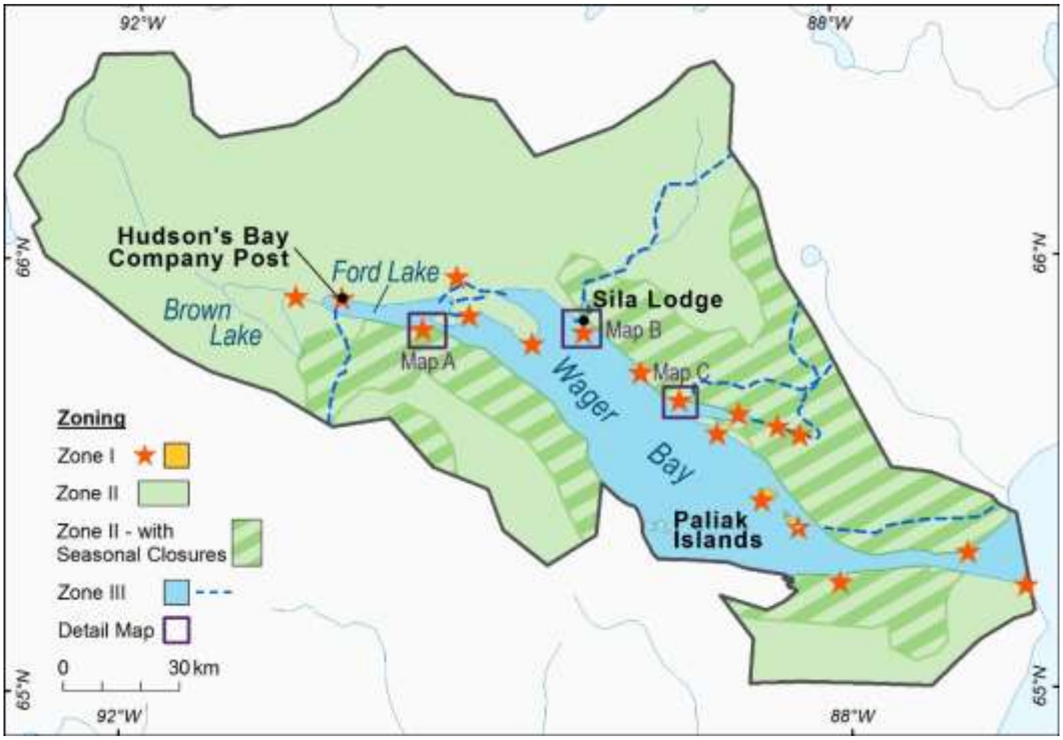
The IIBA does not identify specific needs for areas within the park to be identified as Areas of Special Importance to Inuit, however two such areas were identified during consultations with Inuit (see 6.2 Areas of Special Importance to Inuit).

Important cultural sites, which are deemed critical to telling the story of Ukkusiksalik National Park were assigned a Zone I designation. These sites are expected to be used to tell the story of the park and control visitation. Some activities, with conditions and mitigations, will be permitted in those sites.

Polar bear denning areas, colony nesting areas for migratory birds, and caribou calving habitat have been designated as Zone II areas with seasonal closures. These important habitat areas will be managed with strict controls to support wildlife conservation.

At the time this management plan was written, the results of the Marine Baseline Project had not yet been fully processed. It is expected that some of the information collected during this project could help further refine the zoning in Wager Bay. During the life of this plan, the zoning for Wager Bay may be changed to reflect any sensitive or important feature discovered during the analysis of the information collected during the Marine Baseline Project. In the interim, tools such as Superintendent's Orders, Area Closures, and impact assessment will be used to address issues identified in the results of the project.

Map 3. Ukkusiksalik National Park Zoning




## Zone I – Significant Cultural Resources

ZONE I: SPECIAL PRESERVATION

Zone I sites require special protection because they contain or support unique, sensitive, threatened or endangered natural or cultural heritage features, or are among the best examples of the features of the natural region represented by the park. Visitation to Zone I sites may be authorized under carefully controlled and monitored conditions. Motorized access is not permitted, except for strictly controlled motorized access for research and park operation activities authorized by Parks Canada.

Several important cultural resources have been identified in the park that, if disturbed, would impede the ability of Parks Canada to tell the story of Ukkusiksalik. Of the approximately 449 known cultural sites in the park, 37 have been recognized as being important in this sense. As more research takes place in the park, it is expected that this selection could change. Respecting the integrity of these and all of the park's cultural resources is important. As such, Special Preservation zoning has been applied using buffers of varying sizes to a selection of these sites. Site specific guidelines are being developed to prevent disturbance for each resource.

No camping activities are allowed within the buffers identified for Zone I sites of cultural significance.

In addition to general archaeological and historical investigations, priority will be placed on the cultural resources which have been deemed to be rare, sensitive, and unique within the parks (Table 1).

*Table 1 Rare, sensitive, and unique cultural resources of Ukkusiksalik National Park*

| Site Name and/or Location | Site IDs | Description | Buffer Size (km) |
|---|---|---|---|
| Ak&ungitautitalik * | 70X249 | Site of the Rope Game | 1.0 |
| Wager Bay Inlet Hudson's Bay Company Post and associated sites** | 70X331<br>70X332<br>70X461<br>70X330<br>70X521<br>70X518<br>70X462 | Former HBC Post<br>Campsite<br>Wager Inlet site<br>Campsite<br>Wolf trap remains<br>Burial site<br>Campsite | 1+ (irregular) |
| Nuvukliit Island Archipelago | 70X222<br>70X237<br>70X223 | Catholic Mission<br>Main Savage Island<br>Nuvukliik Island | 1+ (irregular) |
| Former Hudson's Bay Depot site/Iglujuarnaq | 70X403<br>70X404 | Tundra Vehicle A<br>Iglujuarnaq | 0.5<br>1.0 |
| Lower Piksimanik River | 70X360<br>70X259 | Falcon Pinnacle<br>Sakamoqtoq | 1.0<br>0.5 |
| Reversing Falls habitation sites | 70X467<br>70X471<br>70X78 | Campsite<br>Reversing Falls<br>Campsite | 1.0<br>1.0<br>0.5 |
| Tinittuktuq Point | 70X1<br>70X2<br>70X3<br>70X4<br>70X505<br>70X516<br>70X506 | Point A<br>Point B<br>Point C<br>Point D<br>Campsite<br>Campsite<br>Burial site | 1+ (irregular) |
| Sila River Bluffs | 70X305 | Sila River Bluffs A | 0.5 |
| Douglas Harbour, north shore | 70X270<br><br>70X513<br>70X266 | Douglas Harbour Site, across from Tikilak Point<br>Campsite<br>Campsite | 1.5<br><br>1.0<br>0.5 |
| Tijiarjuaq Peninsula | 70X52 | Tijiarjuaq Peninsula | 1.0 |
| Mattok | n/a | The remains of the George Cleveland Whaling Station | 2.5 |
| Qaurnak Winter House | 70X318 | Qaurnak Winter House site | 0.5 |
| Brown Lake | 70X338 | Brown Lake | 1.0 |
| Cape Dobbs | 70X151 | Cape Dobbs | 1.5 |
| Kuugarjuk Creek | 70X280<br>70X281 | Creek A<br>Creek B | 5.0<br>5.0 |
| Handkerchief Inlet/Kangirsuarjuk | n/a | Shipwreck of the *Jeanie* and the remains of *RCMP Patrol House #3* | 5.0 |

* Visitation to Ak&ungitautitalik will not be permitted until site specific guidelines are created.

** Visitation to Hudson's Bay Post has been identified as a potential site for visitor experience within the IIBA and will be open for visitors under specific guidelines. Visitors to this area must be accompanied by an approved guide and/or Parks Canada staff member.

## Zone II – Park Wilderness Areas

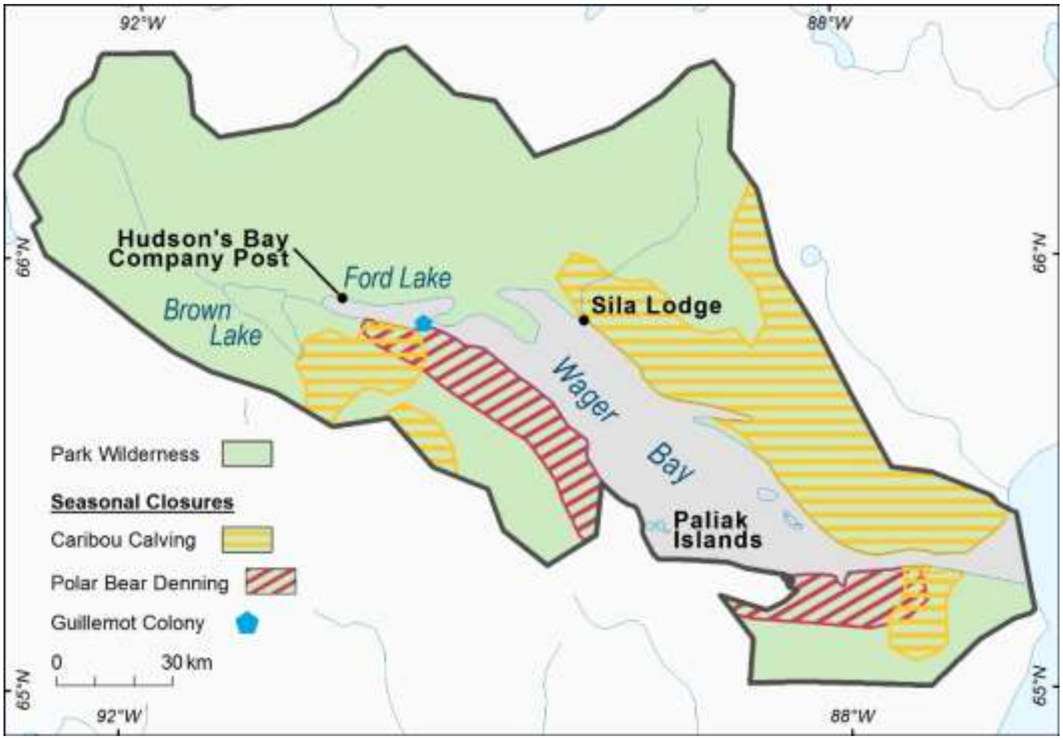
| ZONE II – WILDERNESS |
| --- |
| Zone II contains extensive areas that are good representations of a natural region and are conserved in a wilderness state. The perpetuation of ecosystems with minimal human interference is the key consideration. Zone II areas offer opportunities for visitors to experience firsthand the park's ecosystems and require few, if any, rudimentary services and facilities. In much of Zone II, visitors have the opportunity to experience remoteness and solitude. Motorized access is not permitted except strictly controlled motorized access for research, park operations and outreach and education activities relating to the park that are authorized by Parks Canada and are consistent with Parks Canada regulations and policy. |

Ukkusiksalik National Park is a vast wilderness known for its abundant animal and plant life that have sustained Inuit for generations. The zoning as wilderness area and associated closures, reflect the requirement for conservation of the natural features of the park while also addressing the temporary nature of the need for protection wildlife and associated habitat (Map 4). As is required by the *Nunavut Agreement* the majority of the park falls within this designation. The only areas not included into the Wilderness Zoning are those listed above as important cultural sites and those areas listed below as park access routes and landing zones (Map 5).

Important natural features in Ukkusiksalik National Park for which a greater degree of protection (for which time bound closures have been prescribed) is warranted include the following:

1. Caribou calving areas (seasonal closure mid-May to July 1). The season may shift over the life of this management plan, based on updated information. Entry into caribou calving areas during the identified calving season is prohibited, including Zone 3 access routes that transit these areas.
2. Polar bear denning areas (seasonal March 1 to July 1). The season may shift over the life of this management plan, based on updated information. Entry into denning areas is prohibited, including Zone 3 access routes that transit these areas.
3. Guillemot, eider duck, and other nesting colonies (seasonal closure while birds are present on the nests). Park visitors may only observe colonies from a distance and must respect setbacks listed in the *Migratory Birds Convention Act*.

Map 4. Zone II Wilderness and Seasonal Closures

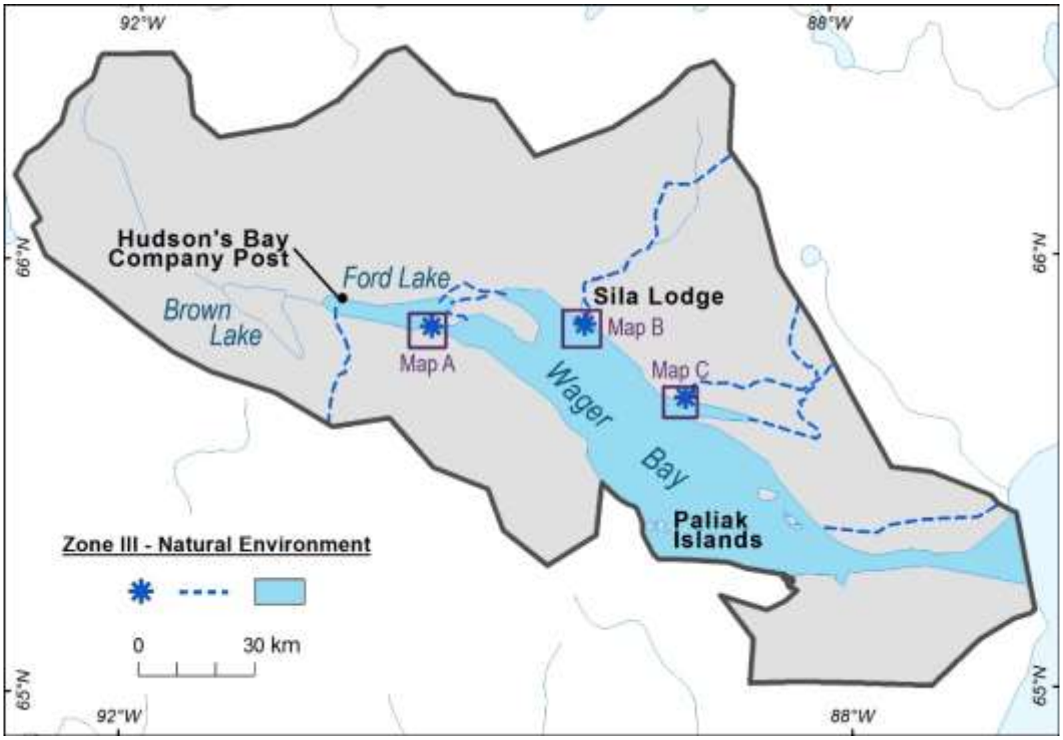



## Zone III – Park Access

| ZONE III – NATURAL ENVIRONMENT |
|---|
| In Zone III areas, visitors can discover the park's natural and cultural heritage through recreational activities that require a few rustic services and facilities. Motorized access will be permitted to specific, controlled areas only. |

In order to facilitate visitation to the park, several areas of the park have been designated as Zone III Natural Environment. This designation allows the use of motorized means of transportation. Given the remote nature of the park, these areas are important in order to allow outfitters and visitors to enter the park and access key jumping off points for visits. At this time four over snow routes, Wager Bay and two aircraft landing zones have been identified in the park (Map 5). Furthermore the IIBA includes a clause that permits access through the park for potential mining and thus zoning would have to be revisited to potentially support this potential project.

Map 5. Park Access Routes and Landing Zones




Over-snow Routes:

- Sila River route
- North Piksimanik route
- South Piksimanik route
- Ford Lake route

Motorized access over land is only possible during the winter months as there are no roads in the area. Three routes were identified originating from Naujaat and one originating from communities south of the park. As it is the case in other parks in Nunavut, only trips led by outfitters and Park Canada employees will be allowed to use over snow vehicles to access the park. New routes may be permitted in the future. Travel through caribou calving and bear denning areas during the identified season will be prohibited.

Wager Bay and Ford Lake:

- Wager Bay-Ford Lake access

Currents at the mouth of Wager Bay have been recorded at up to eight knots. The tides in the bay are said to be comparable in magnitude to Frobisher Bay in Nunavut and are impressively high. Entry into the park from Roes Welcome Sound into Wager Bay is possible although a high degree of knowledge of the tides and currents is needed to navigate into the park safely. Access by smaller watercraft into Ford Lake is allowed via a specific channel that has been designated as a Zone III. Navigating this channel through the reversing tidal rapids at the entrance to Ford Lake is dangerous and is not recommended to unguided visitors (Map A).

Map A. Ford Lake Access Channel


Aircraft Access:

- Sila Lodge aerodrome[7]
- Ford Lake aerodrome

Aircraft access to designated landing sites within the park will be permitted. In cooperation with the Inuit, and local organizations, Parks Canada will work with the UPMC to identify any new landing sites. Selected sites will minimize potential impacts on natural and cultural resources, Inuit exercising harvesting rights, and other parks users, while optimizing visitor experience. The intent is not to develop or maintain landing strips in the park, but to identify helicopter landing sites or places where fixed-wing aircraft have safely landed in the past. Landing sites outside the park on Inuit Owned Lands and Crown lands should also be considered, in discussion with the appropriate authorities.

Two areas in the park were identified as accessible to fixed-wing aircraft. These areas are: the existing landing strip at Sila Lodge, and summer floatplane access at Ford Lake. On-ice landings may be possible at these locations. All aircraft landings in the park must be authorized by Parks Canada in accordance with the regulations. ()

## Zone III – Sila Lodge Buffer

When the park was established two leases managed by Indigenous and Northern Affairs Canada were excluded from the lands transferred to the park. These leases are occupied by a former naturalist lodge. Natural environment zoning has been placed around these leases, giving the operators of the lodge the opportunity to resume operating as they have historically (See Map B).

[7] The Sila Lodge aerodrome is not part of Ukkusiksalik National Park, although Parks Canada frequently uses the airstrip for park operations.

Map B. Sila Lodge Zone III Buffer


## Zone III – Douglas Harbour

When the park was established, the Government of Nunavut Department of the Environment had a research cabin located in Douglas Harbour in Wager Bay. The continued existence of a facility at this location is important for monitoring of wildlife populations by the Department of the Environment. Furthermore, the location is used by Inuit taking part in traditional harvesting activities or travelling in the park. Natural environment zoning has been placed around the existing site. Additional space in the zone has been added to allow for limited expansion of the infrastructure at the site to support future park operational activities, if required (Map C).

Map C. Douglas Harbour Zone III


## 6.2 Areas of Special Importance to Inuit

The intent of designating a portion of a national park as an Area of Special Importance to Inuit is to maintain its character for Inuit who may still use those areas as they have done historically prior to the establishment of the park and in recognition of Schedule 6-1 of the *Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada* which states that "Inuit are an integral part of the ecosystem". Indeed, the absence of Inuit in the ecosystems of Ukkusiksalik National Park would represent a failure of the Agency in maintaining ecological integrity. Restrictions on visitation to Areas of Special Importance to Inuit can be put in place, however no such recommendations were made at this time in the case of the two areas identified for the park. (See Map 6)

In Ukkusiksalik National Park, the following have been declared as Areas of Special Importance to Inuit:

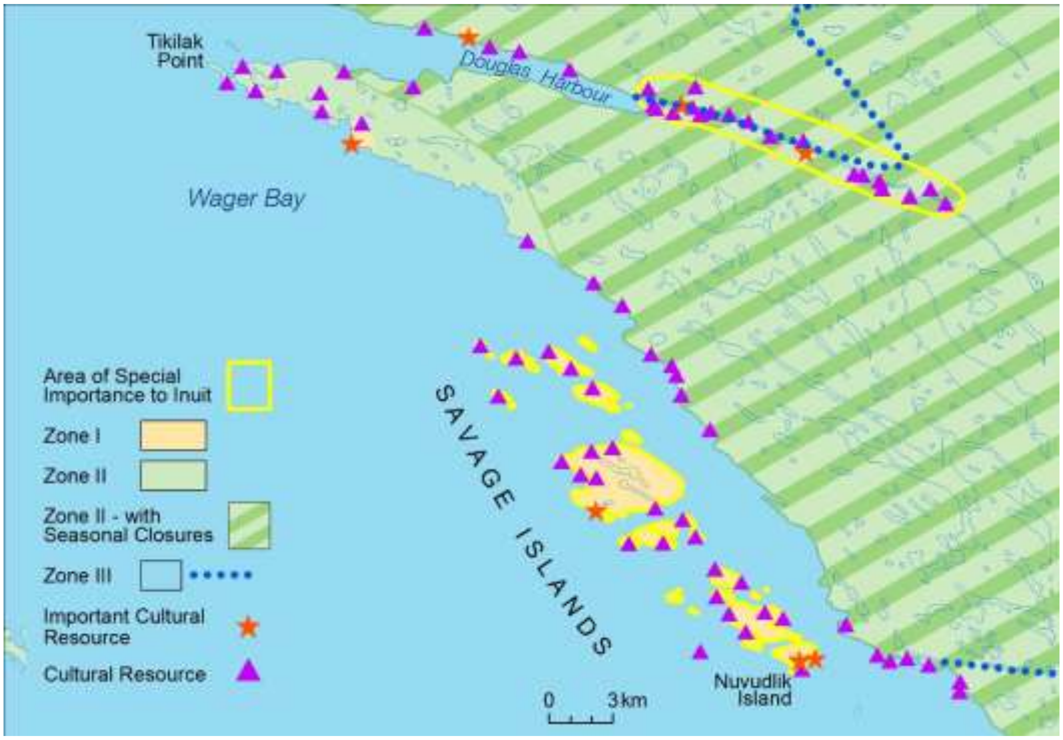
1. Lower reaches of the Piksimanik River

This area was an important seasonal habitation area and was traditionally inhabited by Inuit until they were forcefully relocated into modern communities only a few decades ago, however the areas were important at different times during the year for generations prior. Numerous cultural sites, including sod houses, tent rings, caches, soap stone quarries, and fish weirs are located in this area.

2. The Savage Islands

This grouping of islands located inside Wager Bay was an important habitation area and is also the location of the Nuvudliik Island Catholic mission. Inuit inhabited these islands during the winter months due to their proximity to a polynya and its associated floe edge.

Map 6. Areas of Special Importance to Inuit




## 6.3 Visitor Safety Restrictions or Closures

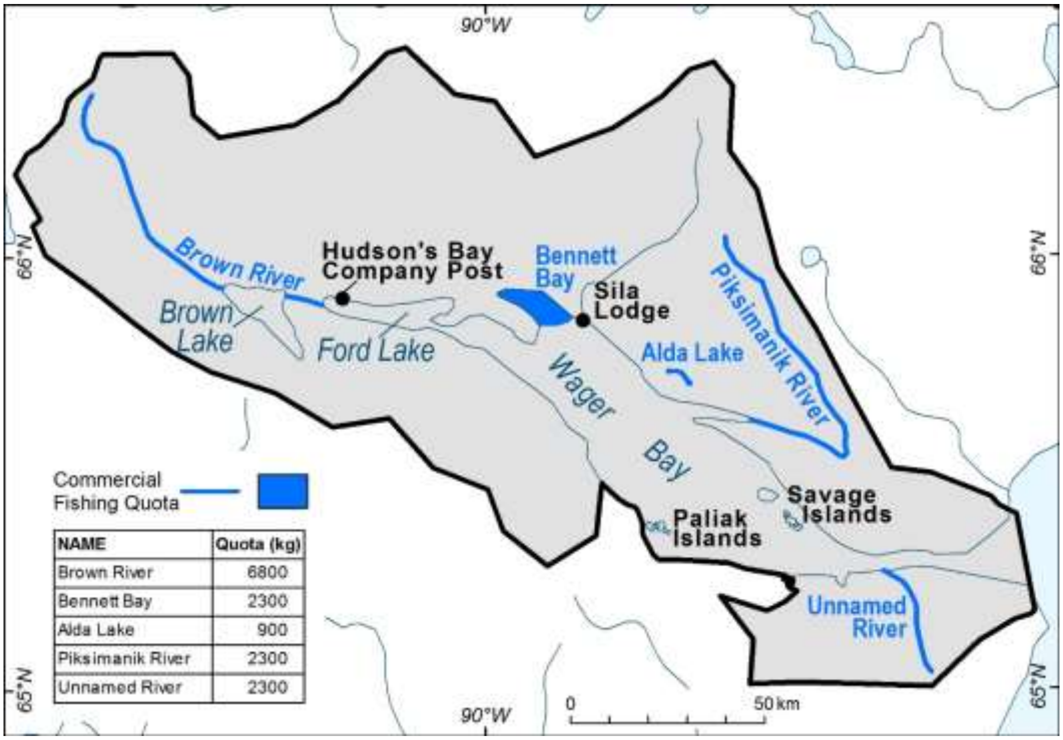
A Superintendent's Order is currently in place compelling all visitors to register and de-register from the park. This measure is in place due to the inherently hazardous nature of park use in Nunavut and to ensure park staff are able to respond to an emergency should one occur.

## 6.4 Recreational Fishing by Visitors

Currently, Parks Canada does not have a conservation concern with fish populations in the park. According to Inuit, there are places in the park where arctic char are abundant and have been harvested for many generations.

Angling by non-Inuit for recreational purposes will be authorized under a Parks Canada fishing permit, once the *National Parks of Canada Fishing Regulations* (C.R.C., c. 1120) have been updated to include Ukkusiksalik National Park. Restrictions may be set on the number and species of fish that may be caught per person per day. In the park, limits placed on personal catch may mirror the territorial regulations for the areas surrounding the park. Moreover, for potential recreational fishing, it is the desire of the Joint Park Management Committee that any fish caught be kept (for consumption) and not live-released. Further recreational fishing management proposals include: catch and possession limits of four fish per day per person and sport fishing prohibitions in areas (Map 7) with commercial fishing quotas.

Map 7. Commercial Fishing Quotas



# 7.0 Summary of Strategic Environmental Assessment

Parks Canada is responsible for assessing and mitigating the impacts of management actions on ecosystems and on cultural resources. In accordance with *The Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals* (2010), a strategic environmental assessment (SEA) was conducted for the Ukkusiksalik National Park Management Plan (2017). The purpose of SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally-sound decision making. The following is a summary of the environmental assessment.

The intent of the park management plan is to continue providing an enhanced level of protection to the exceptional ecological diversity and integrity of an area representative of the Central Tundra Natural Region and to sustain and give recognition to the history of human relationships with the landscape. Environmental and cultural components of note at the park include Wager Bay with its two polynyas that provide an important resource for a variety of marine wildlife and approximately four hundred fifty known cultural sites.

Implementation of the plan will result primarily in positive results. The understanding and management of natural and cultural resources will benefit from research and monitoring that is collaborative with local and regional partners and integrated with traditional knowledge. The ecological integrity monitoring program will also be further developed. Elements of the environment important to visitor experience will benefit from the development of interpretive products and visitation/wildlife viewing guidelines.

The development of appropriate facilities for protection, presentation, and promotion of the park will be managed and mitigated through the environmental impact assessment process under the *Nunavut Planning and Project Assessment Act*. Other strategies are proposed in the plan with positive impacts such as the increased research and monitoring of natural and cultural resources and enhancement of visitor experience through the development of interpretive products and visitation/wildlife viewing guidelines. Additionally, existing policies such as park zoning protect the majority of the park as zone I (special preservation), zone II (wilderness) and Areas of Special Importance to Inuit.

Public and Indigenous engagement was conducted on the plan. The Ukkusiksalik Park Management Committee, the Nunavut Wildlife Management Board, and Inuit from the park's five adjacent communities were involved in the preparation of the management plan.

There are no important negative environmental effects anticipated from implementation of the Ukkusiksalik National Park Management Plan.

# 8.0 Acknowledgements

The preparation of this Management Plan involved many people. The input of this diverse group of individuals will result in a plan that will guide the management of the park for many years. The following individuals have made a special contribution and deserve mention:

### Ukkusiksalik Park Planning Team

Donna Parry, Nunavut Tourism
Elizabeth Aglukka, Ukkusiksalik Joint Park Management Committee
John Tatty, Ukkusiksalik Joint Park Management Committee
Monty Yank, Park Manager, Parks Canada

### Ukkusiksalik Joint Park Management Committee

Donat Milortok, Naujaat
Elizabeth Aglukka, Naujaat
Jackie Nakoolak, Chair, Coral Harbour
Joan Scottie, Baker Lake
John Tatty, Rankin Inlet
Larry Tautu, Chesterfield Inlet

### Naujaat Inuit Knowledge Working Group

Elizabeth Kidlapik, Hunters and Trappers Organization
Honore Aglukka, Elder
Jimmy Immingark, Hunters and Trappers Organization
Mary Tuktudjuk, Elder/Chair
Solomon Malliki, Youth Representation

Ukkusiksalik
National Park

# Draft Park Management Plan

## Consultation Summary

### Methods of Consultation

- Consultation was undertaken mainly through face-to-face meetings. These meetings occurred in all of the park's adjacent communities. Where face-to-face meetings were not possible, written materials in English and Inuktitut were sent to key stakeholders for comment.

- In addition to face-to-face meetings, radio broadcasts on community radio were made in Naujaat, Coral Harbour, and Chesterfield Inlet.

- Written materials were sent to stakeholders for comment if a face-to-face meeting could not be arranged

- Targeted consultations also took place in communities where key stakeholder groups were not available to meet. In those instances as many members of the key stakeholder groups as possible were met with by the planner and park manager

### Organizations Consulted and Estimated Number of Individuals Consulted

| Group & Community | Type of Consultation | Estimate of Number of Individuals |
|---|---|---|
| Naujaat | | |
| Ukkusiksalik Joint Park Management Committee | Face-to-face, planning workshop, conference calls | 4 |
| Ukkusiksalik Inuit Knowledge Working Group | Face-to-face, planning workshop | 7 |
| Hunters and Trappers Organization | Face-to-face | 11 |
| Naujaat Hamlet Council | Face-to-face | 9 |
| Royal Canadian Army Cadet Corps #3055 | Face-to-face | 20 |
| Naujaat Community Radio* | Call-in show | ? |
| Park office open house* | Open house | 3 |
| Individuals and business owners | Face-to-face | 2 |
| Wildlife Officer | Face-to-face | 1 |
| | | **Total 57** |

| | | |
|---|---|---|
| Coral Harbour | | |
| Hamlet Council | Face-to-face | 6 |
| Hunters and Trappers Organization & Wildlife Officers* | Face-to-face, radio invitation | 11 |
| Individuals and business owners* | Face-to-face | 3 |
| | | **Total 20** |
| Rankin Inlet | | |
| Hamlet SAO | Face-to-face | 1 |
| GN Parks | Face-to-face | 2 |
| Wildlife officer | Face-to-face | 1 |
| Kivalliq Business Development Corporation | Face-to-face | 1 |
| Individuals and business owners* | Face-to-face | 3 |
| Kivalliq Wildlife Secretariat | Written | ? |
| Hunters and Trappers Organization | Written | ? |
| Information centre, Rankin Inlet Coop* | Open house | 32 |
| Information centre, Rankin Inlet Northern* | Open house | 18 |
| Indigenous and Northern Affairs Canada | Face-to-face | 2 |
| Kivalliq Inuit Association, Lands and Implementation | Face-to-face | 2 |
| GN Community and Government Services | Face-to-face | 1 |
| Qulliq Energy Corporation | Face-to-face | 1 |
| | | **Total 64** |
| Chesterfield Inlet | | |
| Hamlet of Chesterfield Inlet, EDO & SAO | Face-to-face | 2 |
| Hunters and Trappers Organization* | Face-to-face, radio invitation | 4 |
| | | **Total 6** |

| | | |
|---|---|---|
| Baker Lake | | |
| Hamlet of Baker Lake, EDO & SAO | Face-to-face | 2 |
| Inuit Heritage Centre | Face-to-face | 1 |
| Hunters and Trappers Organizations | Face-to-face | 6 |
| Wildlife Officer | Face-to-face | 1 |
| Individuals and business owners* | Face-to-face | 3 |
| | | **Total 13** |
| Iqaluit | | |
| GN Department of the Environment | Email | 1 |
| GN Economic Development and Tourism | Email | 2 |
| Department of Fisheries and Oceans | Face-to-face | 2 |
| Canadian Northern Economic Development Agency | Email | 2 |
| Office of the Honourable Dennis Patterson | Email | 1 |
| Nunavut Wildlife Management Board staff | Face-to-face | 1 |
| Inuit Heritage Trust | Face-to-face | 5 |
| World Wildlife Fund Canada | Face-to-face | 1 |
| Nunavut Tourism | Face-to-face | 1 |
| | | **Total 16** |
| | | **Grand Total 176** |

*indicates meetings which were open to the general public

## Summary of Results

This includes any responses and accommodations which were inserted into the draft management plan.

The final draft of the Management Plan will be sent to the Kivalliq Inuit Association in accordance with Article 6.3.1 of the Inuit Impact and Benefit Agreement for Ukkusiksalik National Park of Canada.

The *Canada National Parks Act*, *Nunavut Agreement*, and IIBA require that a management plan be developed for Ukkusiksalik National Park. The park management plan must be completed within five years of its inclusion in Schedule 1 of the *Canada National Parks Act*. The development of this management plan is on schedule.

Parks Canada, and the PPT developed draft Key Strategies, Objectives, Targets, and a Zoning Plan between August 2016 and May of 2017 with contributions from the Ukkusiksalik Inuit Knowledge Working Group (IKWG), Kivalliq Inuit Association, and Hunter and Trapper Organizations from the park's adjacent communities.

Public and stakeholder consultations were held between November 2016 and May 2017 as part of the management planning process. The requirement for consultation and direction or guidance on consultation methods for this management planning process are identified in the *Nunavut Agreement* (Article 8), IIBA (Schedule 6-1), *Canada National Parks Act* (Section 12), Government of Canada policy, and court decisions on consultation with Indigenous peoples.

As part of the consultation process comments and input were sought from the park's adjacent communities including from Hunter and Trapper Organizations, Hamlet councils, Wildlife Officers, youth and community groups, and business owners. We sought input and comments from the Government of Nunavut, Federal departments and agencies with a mandate in Nunavut, Nunavut Tourism, the Inuit Heritage Trust, World Wildlife Fund Canada, and other members of the public at large.

No substantive issues were raised during consultations.

The final draft Management Plan will include suggestions from Naujaat based on IQ, that a location near Iglujuarnaq (Morso Bay) would be a good location for hard sided shelter within the park. This suggestion was well-received and will be incorporated in the final draft management plan.

The final draft Management Plan accommodates the wishes of Naujaammiut that the lower Piksimanik River and the Nuvuk&lik archipelago (Savage Islands) be recognized as Areas of Special Importance to Inuit. This designation gives an even greater degree of control over those areas to Inuit and provides Parks Canada with a mandate to establish a greater degree of protection for any cultural or natural feature of importance to Inuit in the designated areas.

Many other comments and questions were received during consultations, but a lot of it was not the type of information which is typically included in a management plan. The other information will help Parks Canada gather new IQ and helps us stay informed about what is happening on the land and in the Park's adjacent communities. These are some examples of other information we heard:

- Inuit from the communities are still asking if it is OK to harvest in the park – the answer is YES! We want Inuit to harvest in the park
- Several groups shared details of their plans for tourism development and/or are interested in any tourism development for their communities and for the park – E.g. the Hamlet of Coral Harbour would like to build a lodge in Duke of York Bay
- Everyone we consulted with agrees that building/maintaining shelters in the park is a very good idea
- Everyone we consulted with agrees that preserving the Hudson's Bay Company post is important
- Everyone we consulted with is interested in hearing information about the Marine Baseline Project, especially the tide information and any navigational charts
- We heard that Inuit who harvest in the park are usually trying to catch wolves and/or wolverine, but they also will try to catch other animals like caribou
- We heard that the stories of Wager Bay and of Ukkusiksalik are related to many other places in the region like the Back River area and Cape Fullerton (and many other places)

Three key strategies were developed for this Management Plan:

1. Safe and Sound – Ensuring that appropriate facilities are available for the protection, presentation, and promotion of Ukkusiksalik National Park

2. Living Landscape – Strengthening people's connections to Ukkusiksalik National Park

3. Gathering Knowledge – Collecting scientific information and Inuit knowledge to help protect, present, and promote Ukkusiksalik National Park's natural and cultural resources

### Next Steps

If UPMC agrees with the suggested input and is satisfied with the amount of consultation conducted, the Planner respectfully requests that the UPMC debate a motion to endorse this consultation summary.

Parks Canada must still circulate the draft plan to Executive Management to obtain their input. Once this is done, we can present a completed Draft Management Plan to UPMC for a motion to debate its endorsement and to present it to the Nunavut Wildlife Management Board and to Kivalliq Inuit Association.

### Prepared by:

Alain Joseph, Planner, Parks Canada Agency

### Date:

3 November 2017

**Motion #: 2017-05-25-001**

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UPMC Teleconference
March 25, 2017

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ᒦ 25, 2017

UPMC passes a motion to approve the Consultation Summary of the Ukkusiksalik National Park Draft Park Management Plan, as presented by Park Planner: Alain Joseph.

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Motoin by: Larry Tautu
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Second by: John Tatty
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All in favour x
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Opposed: 0
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Date: May 25, 2017
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**Ukkusiksalik Park Management**
**Face-to-face meeting**
**Chesterfield Inlet, Nu**
**October 18, 2017**
**Motion #: 2017-10-18-001**

Subject to review by KIA and approved by NWMB, the UPMC tentatively approve the UNP management plan as presented.

Recommended by:

Seconded by: Elizabeth AGlukka

All in favour: 4

Pass: 4

Abstained: Ø

Motion passed: ✓

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**ᐃᒡᓗᓕᒑᕐᔪᒃ, ᓄᓇᕗᑦ**
**ᐊᒃᑐᐸ 18, 2017**
**ᓅᑕᐅᔪᖅ #: 2017-10-18-001**

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ᐱᕐᑯᔨᕗᖕᒫᖅᑐᖅ:

ᑐᓪᓕᖅᓯᔪᖅ: Elizabeth AGlukka

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ᓈᒻᒪᒋᔭᐅᔪᖅ ᑲᔪᓯᑎᑕᐅᔪᖅ: ✓

# SUBMISSION TO THE
# NUNAVUT WILDLIFE MANAGEMENT BOARD

## NWMB Regular Meeting No. RM 004-2017

FOR: Information ___X____ Decision ______

Issue:

Concerns over the delays revising the *Allocation Policy for Commercial Marine Fisheries*

# Background:

Mandate of the NWMB

In the last two decades, Nunavut's fishing industry has grown exponentially in terms of available quota, revenue generation, number of enterprises, harvesting capacity, and Inuit employment. These improvements are remarkable and worthy of recognition. However, this industry operates in an environment of uncertainty and unpredictability found in no other fishery in Canada. As part of the commercial fisheries co-management processes outlined in the Nunavut Agreement, enterprises are subject to an allocation process that externally determines how much quota – and therefore revenue – a company is permitted. Elsewhere in Canada, most enterprises own their fishing quotas and are only affected by changes in the total allowable catch year to year.

The Nunavut Wildlife Management Board (NWMB) administers this process using the *Allocation Policy for Commercial Marine Fisheries* (Policy). Established in 2007, the Policy was written to create a "fair, open and transparent process to determine access and allocations". Quota recommendations are developed by the NWMB for the Minister of Fisheries and Oceans and are in part based on the Fisheries Advisory Committee's (FAC) review of submitted applications and/or annual reports.

The Policy was revised in 2012 after undergoing extensive industry consultations, and minor revisions were included in 2015. In early 2016, a second major review of the Policy was initiated to address the various implementation challenges that had been identified. This revision was applauded by the Nunavut fishing industry as well as the FAC as all parties agreed that the Policy no longer met the needs of the Nunavut fishery and more importantly was not meeting its objectives.

This review began in May 2016. After receiving a second set of comments from stakeholders in the fall of 2016, the NWMB staff intended to begin drafting revisions. However, for more than a year no further progress on the Policy's revisions have been communicated to industry stakeholders.

There was significant optimism in the industry that the Policy's limitations and ambiguousness would be corrected before any further calls for applications were requested. Unfortunately, one call for applications and one for annual reports have been issued in the last year. A second call for applications was prevented at the last minute due to objections from industry.

Request for Stability for the Fishing Industry

The following submission to the NWMB is intended to outline how the continued delays to modifying the Policy are creating uncertainty in the industry and problems of past recommendations of the FAC are being repeated. Furthermore, Arctic Fishery Alliance L.P. (AFA) is requesting that the Policy's revisions be prioritized for completion by summer 2018 by the NWMB and that calls for quota applications or annual reports be suspended until the Policy is amended. Similarly, any recommendations made by the FAC should not be considered until a revised allocation policy is implemented.

Repeatedly issuing calls for these applications while the Policy is under review distracts each enterprise from its primary purpose of running a successful fishing business and requires a significant investment of resources by each company. While the NWMB has chosen to maintain the *status quo* after these applications were evaluated – decisions that were completely correct given the challenges associated with implementing a flawed Policy – these calls still exposed all four quota holders to the risks of changes to their quotas.

Most Nunavut fishing enterprises have invested millions of dollars in vessels and other infrastructure to create this industry's impressive growth. These capital purchases were made possible because both the quota holders and their lending agencies assumed that an enterprise's quotas will remain reasonably constant if the Policy is fairly and objectively applied. As mentioned previously, nowhere else in Canada are fishing enterprises subject to such rigorous external oversight to receive and maintain their quotas and thus, their source of revenue generation. If we are to continue to develop and make investments as an industry, a stable foundation of reliable quotas and revenues is needed. Continuing to operate under Policy universally acknowledged as flawed has the opposite effect. If a "fair, open and transparent" process for earning and retaining allocations is the mechanism by which fishing access will be granted, then the Policy must be revised as soon as possible.

## Direct Appeals to the NWMB Regarding Allocations

As a result of these Policy review delays and continuing calls for applications, some of the quota holders in Nunavut are now seeking alternative means to build a case for greater allocations. For instance, one quota holder made a direct appeal to the NWMB during the Board's regular meeting in September 2017 (RM003-2017). After providing information on its history in the fishing industry, as well as some of its recent investments, the presentation explicitly stated that this quota holder was seeking to "persuade the NWMB that [its] request for higher fishery quota/allocations is justified".

AFA strongly believes that such actions are wrong and undermine the system of fairness the Policy is meant to create. Hence, we felt we had no choice but to address this impropriety and appeal to the NWMB to refocus their efforts in building a more objective, transparent and equitable allocation process that will lead to greater stability in the industry.

The allocation process in Nunavut is generally a zero-sum game. Unless there is an increase in the total allowable catch of a fishery, the four existing quota holders and now the newly formed fifth fishing enterprise (Qikiqtani Fisheries Alliance) are in direct competition to secure access to a finite amount of turbot or shrimp quota. An increase in one applicant's quota must be taken from one or more of the other enterprises. Therefore, each application and annual report represents the only opportunity to gain or lose part of a primary revenue stream.

Having each recent call end in a rollover of quota, no matter how justified, has clearly prompted some quota holders to ask why the applications were requested in the first place. It is therefore not surprising that one quota holder stood before the NWMB in September and made a direct appeal for quota. From their perspective, what incentive is there to follow a process that has been repeatedly proven to be incapable of being fairly applied?

Rewarding a direct appeal to the NWMB by recommending additional quotas will demonstrate that the allocation process outlined in the Policy can be circumvented. Furthermore, since one enterprise's increase in quota generally requires a corresponding reduction from one or more other quota holders, the remainder of the industry will be strongly tempted to make their own presentations to the NWMB, if only to level the playing field and protect their revenue streams. Instead, AFA asks that the NWMB recognize the dangers in encouraging direct petitions, and instead work with Nunavut's fishing industry and other relevant stakeholders to rebuild a fairer and more objective allocation Policy.

## Continuing FAC Challenges

The repeated calls for quota applications and annual reports since the Policy workshop over a year ago have also reinforced industry's initial concerns regarding the Policy's implementation. First, the Policy currently requires that at least one appointee to the FAC by the Government of Nunavut (GN) and Nunavut Tunngavik Inc. (NTI) to be an "industry expert". Ensuring there are members who are experienced in standard fisheries business practices is critical to achieving a fair allocation process. At present, the membership of the FAC does not meet this "industry expert" standard. Why has the NWMB continually permitted this requirement in the Policy to be ignored?

Developing and retaining capacity in Nunavut is a recognized challenge across many fields. Thus, it was strongly recommended at the Policy workshop and in written submissions that an independent consultant be retained to support the FAC's review of any quota applications and annual reports when such expertise is unavailable "in-house" (i.e. by staff of the GN or NTI). The commercial fisheries affected by this Policy generate over $100 million annually. Therefore, it is imperative that any recommendation made by the FAC regarding allocations is formulated with the fullest comprehension of how such decisions will impact the business plans and multi-million dollar harvesting infrastructure investments made by quota holders.

The second recurring concern lies with the challenges the FAC has encountered applying the Policy's evaluation guidelines. All stakeholders have reached the consensus that these criteria are too ambiguous to fairly and objectively use them. However, the FAC has been asked to use this unclear Policy three times over the last year. As a result, the committee has been forced to choose how they will interpret these broad guidelines to make their recommendations. This has resulted in a lack of transparency and sometimes inconsistency in these evaluations.

For instance, the NWMB recently released the FAC's preliminary recommendations on the 2016 annual reports. In these recommendations, the FAC has chosen to narrowly define and restrict the term "tangible benefit" to cash contributions to owner communities. Notwithstanding the fact that the evaluation form and allocation guideline use the term "direct benefit" not "tangible benefit", this narrow definition excludes most of the benefits the Policy defines as legitimate. Section 7.3 *Benefits to Nunavummiut* states that "[e]xamples of direct benefits are economic benefits to dependent communities, market development and investment in training, research, inshore processing and infrastructure."

This is the only definition provided in the Policy as to what constitutes a benefit. Nowhere in the definition is the phrase "cash contribution" even listed; it would arguably fall under the category of economic benefit to a dependent community. Furthermore, the FAC state they consider it "debatable" whether research should be considered a benefit despite its inclusion in the definition.

As a result of this and other interpretations like it, the FAC have exposed quota holders to the threat of loss of quota worth millions of dollars annually, despite the enterprises' best efforts to meet the requirements of the Policy. These real-world consequences resulting from differences in interpretation underline the ongoing instability the industry faces until the Policy revisions are completed.

The NWMB has overturned the FAC's preliminary recommendations and rolled over the existing allocations since 2015. This reinforces the perception that the allocation process resulting from the current Policy cannot be fairly or transparently implemented. In recognition of the Policy's flaws, AFA therefore reiterates its request that further calls for quota applications or annual reports be suspended until the Policy is amended. Similarly, any recommendations made by the FAC should not be considered until a revised allocation policy is implemented.

Time Required to Present

AFA requests that they have 30 minutes to present this submission.

## Consultations:

No formal consultations have been held on this issue. Informal discussions on the need for the completion of the Policy's review have been held with other members of the Nunavut Offshore Allocation Holders Association on several occasions over the past year. However, this submission reflects the views of Arctic Fishery Alliance and is not intended to be representative of the industry as a whole.

## Recommendation:

It is recommended that the Nunavut Wildlife Management Board direct its Wildlife Management staff to prioritize the completion of the revision process for the *Allocation Policy for Commercial Marine Fisheries*. These revisions must be made in consultation with the fishing industry and other relevant stakeholders. Ideally, the timeline for completion should enable a Call for Applications to be issued in the summer of 2018. In the meantime, we request that the NWMB suspend any further calls for quota applications and annual reports and that any existing FAC recommendations should not be considered until the amendments are made.

## Prepared By:

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## Date:

November 3, 2017

# Concerns over the delays in revising the *Allocation Policy for Commercial Marine Fisheries*

**Presented to:**

**Nunavut Wildlife Management Board - RM 004-2017**

# Outline

- Growth of Nunavut’s fishing industry
- Role of the NMWB in Nunavut’s *Allocation Policy for Commercial Marine Fisheries*
- Policy revision delays & resulting instability for industry
- Concerns over direct appeals for quota
- Lack of industry expertise on FAC
- Allocation guideline ambiguity
- Recommendation

# Growth of Nunavut’s Fisheries

- Over last 20 years, Nunavut’s fishing industry has grown exponentially in terms of:
    - Available quotas for turbot & shrimp
    - Revenue generation
    - Number of enterprises
    - Harvesting capacity
    - Inuit employment

- But, enterprises do not own their quotas
    - Unlike everywhere else in Canada
    - Creates uncertainty & instability

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# Role of NWMB

- NWMB administers *Allocation Policy for Commercial Marine Fisheries* (“Policy”)
  - Applies to turbot & shrimp, but not Arctic char

- Policy meant to create “fair, open and transparent process to determine access and allocations”

- Recommendations for allocations provided by NWMB to Minister for Fisheries & Oceans
  - Based in part on Fisheries Advisory Committee’s (“FAC”) review of quota applications

# Policy Review & Delays

- Policy established in 2007 & revised in 2012
  - Significant stakeholder consultations both times
- 2nd major review launched in 2016 in response to challenges implementing Policy
- NWMB intended to make revisions to Policy following workshop
- No further updates provided for over a year

# Calls for Applications Continue

- Industry hoped no requests for applications would occur while Policy under review

- But, 2 calls for applications & 1 for an annual report issued over last year

- Recommendations by FAC overruled by NWMB for applications & *status quo* maintained
  - Annual report process still underway

# Instability for Industry

- Preparing applications requires significant time & resources by enterprises
  - Distracts from primary purpose of fishing
- Each application exposed applicants to risk of losing quota
  - This oversight is unique to Nunavut



# Instability for Investments

- Most Nunavut enterprises have invested millions of dollars in vessels & other harvesting infrastructure

- Purchases made possible because quota holders & lending agencies trust quota will be retained if Policy guidelines met

- With Policy under review, quota stability in question

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# Concerns over Direct Appeals

- Some quota holders now seeking other ways to secure quota
- Presentation made by one enterprise to NWMB in September (RM 003-2017)
- Aimed to "persuade the NMWB that [its] request for higher fishery quota/allocations is justified"

# Zero-Sum Situation

- Allocation process is zero-sum situation
- For one quota holder to gain quota, one or more other enterprises must lose quota
- 4 quota holders & the new fishing enterprise are in direct competition

# Concerns over Direct Appeals

- Directly presenting to NWMB undermines Policy
- If this is rewarded with additional quota, it will demonstrate Policy can be bypassed
- AFA requests that the dangers of entertaining direct appeals be recognized

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# Industry Expertise on FAC

- Existing Policy requires Government of Nunavut & Nunavut Tunngavik Inc. to each appoint a member to FAC with “industry expertise”

- Experience in standard fisheries business practices critical to fair assessments

- Current membership of FAC not meeting this requirement

# Importance of Industry Expertise

- Nunavut’s turbot & shrimp quotas generate $100 million annually in revenue
  - Enterprises have millions of dollars of investments

- Evaluations of complicated business plans difficult

- Recommendations to reduce quotas can have significant consequences

# Allocation Guideline Ambiguity

- All stakeholders agreed that allocation guidelines not applied objectively

- FAC has chosen to use its own interpretation of these guidelines

- Such decisions are not transparent to industry & are sometimes inconsistent

# Allocation Guideline Ambiguity

- FAC's interpretations sometimes differ from quota holders'

- Resulting recommendations have exposed enterprises to threat of losing millions of dollars annually

- Highlights instability of allocation Policy at present

# Recommendation

- Prioritize completion of revision process for Policy
  - Aim for Call for Applications under amended Policy in summer 2018
  - Changes must be made in consultation with fishing industry & other relevant stakeholders
- Suspend further calls for applications & annual reports until revisions completed & approved
  - In the interim, FAC recommendations should not be considered until guidelines are made more fair, objective & transparent


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Thank You
Questions?