



## Submission to the Nunavut Wildlife Management Board

### FOR DECISION

**Issue:** Request for approval of the proposed final *Management Plan for the Dolphin and Union Caribou in Canada*

**Background:**

- To develop the management plan, Environment and Climate Change Canada (ECCC), Government of the Northwest Territories (GNWT) and Government of Nunavut (GN) held a co-management partners joint meeting in Kugluktuk in March 2015 (Appendix I), and in Cambridge Bay in January 2016 (Appendix II). Additional meetings were held via teleconference in 2015 and 2016 to draft and review specific parts of the plan and to receive additional input on the threats calculator portion of the document.
- ECCC does not have jurisdiction for managing the harvest of Dolphin and Union caribou. Therefore, ECCC will adopt the joint management plan, with the exception of the harvest management portion which will be left to the GN and GNWT for implementation in their respective jurisdiction.
- Community consultations on the draft management plan were conducted in April 2016; it was presented to the Ekaluktutiak and Kugluktuk Hunters and Trappers Organizations (HTOs) and the communities. ECCC, GNWT and GN amalgamated the feedback into a comment table (Appendix III), and reviewed and/or incorporated comments into the draft management plan.
- ECCC emailed the comment table to HTOs on June 6, 2016 to ensure the comments captured in the meetings were correct. ECCC followed up with phone calls HTOs about table comments, but did not receive responses from the HTOs. ECCC, GNWT and GN updated the table to show how comments were reviewed and/or incorporated into the document and send the table back to HTOs.
- The first jurisdictional technical review of the draft recovery document was conducted from June 3 to July 8, 2016. ECCC sent the document to the NWMB on June 3, 2016, while the GN sent the document to the HTOs. ECCC did not receive any responses about the draft, but the GN received comments from the Ekaluktutiak HTO. ECCC,

GNWT and GN worked together to review comments received from other jurisdictions and incorporated them into the recovery document if necessary.

- The second jurisdictional technical review of the proposed management plan was conducted from September 2 to October 7, 2016. ECCC sent the document to the NWMB on September 2, while the GN sent the document to HTOs. ECCC, GNWT and GN worked together to review comments received during this process and incorporated them into the recovery document.
- ECCC posted the proposed document from March 30 to May 29, 2017, on the Species at Risk Public Registry for a 60-day public comment period. ECCC sent the document to the HTOs, NTI and NWMB.
- ECCC sent a questionnaire asking for approval of the proposed document to the Kugluktuk and Ekaluktutiak HTOs, and neither raised objections.
- ECCC, GNWT and GN considered the minor comments received during the 60-day public comment period and revised the document in June and July 2017.

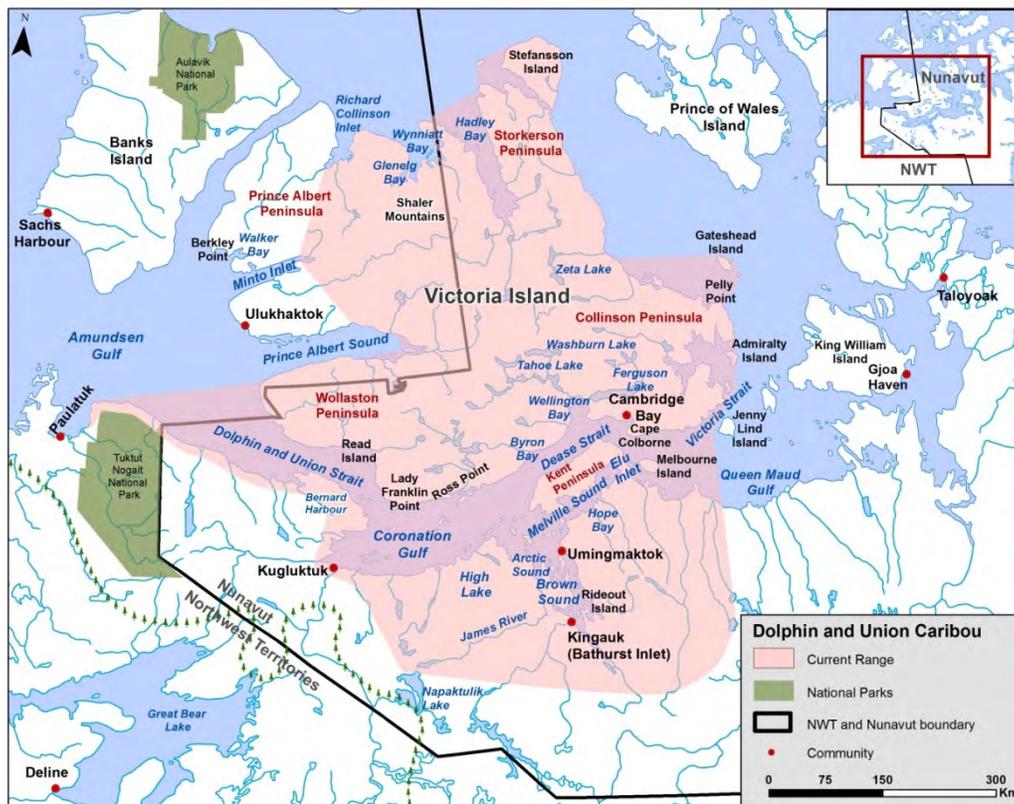


Figure 1. Current range of Dolphin and Union Caribou in NU and NT.

### Next Steps:

- This briefing is the notification of the results of the consultations and accommodation based on consultation record on the recovery document in Nunavut.
- ECCC is now prepared to post the recovery document on the Species at Risk Public Registry as final.
- ECCC and the GN are providing the recovery document to the NWMB for final approval decision as per the NLCA s. 5.2.34

### Recommendation:

- That the NWMB considers whether or not they approve the proposed final Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada: Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut under the federal Species at Risk Act as per the NLCA s. 5.2.34.



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June 30, 2017



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

**FOR**

**Information:**

**Decision: X**

**Issue: Request a decision to approve or not the Dolphin and Union Management Plan titled “Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada: Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut”.**

## **Background**

- The Dolphin and Union herd was assessed as a Species of Special Concern by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 2004, up-listed under part 4 of Schedule 1 of the federal *Species at Risk Act* in 2011 (SARA) and on the Northwest Territories List of Species at Risk as a species of “special concern” in 2014.
- With the recent assessment by COSEWIC, threats facing Dolphin and Union classified them as high-very high (based on- IUCN-CMP unified threats classifications system), which put a strong emphasis to increase the monitoring effort on the Dolphin and Union herd and the much needed development of a management plan for the herd.
- Dumond and Lee (2007) estimated the extrapolated population of Dolphin and Union caribou at  $27,787 \pm 7,537$  (95% CI), and the same analysis was applied to the 1997 estimates resulting in a revised extrapolated estimate of  $34,558 \pm 6,801$  (95% CI) caribou.
- The 2015 extrapolated population of Dolphin and Union Caribou was estimated at  $18,413 \pm 6,795$  caribou (95% CI). This estimate shows signs of decline relative to the 2007 survey estimates (z-test,  $Z=-2.19$ ,  $p=0.036$ ). There has been an overall decline of 33.8%, or 5% annually since 1997.
- Environment and Climate Change Canada (ECCC) must produce a federal management plan for the Dolphin and Union caribou under the federal Species At Risk Act.
- The Government of Northwest Territories (GNWT) is also required to develop a management plan under its Territorial Species at Risk Act.
- Since 2015, the Government of Nunavut, Department of Environment (GN-DOE), has committed to taking part in the development of the Dolphin and Union Management Plan. GN-DOE has participated actively and provided technical information and expertise into the management plan development process.

- The Dolphin and Union Management Plan was drafted based on the input received from the co-management partners (HTOs, NTI, KRWB) during the first and second joint meetings, draft consultation, and two jurisdictions reviews to accommodate their comments.
- The Dolphin and Union Management Plan was developed upon a community-based management approach in consultation with all the communities that harvest from this caribou herds. There were two rounds of community and public engagements, consultations at different phase of the management plan development to assure active community participation and accommodation.

## **Current Status**

- The Government of Nunavut's Department of Environment (DOE) has been working with communities, HTOs, KRWO, NTI and interjurisdictional co-management partners (Environment Canada, and Government of Northwest Territories) to develop a joint management plan for Dolphin and Union caribou herd. The first engagement teleconference call happened on February 18, 2015
- ECCC does not have jurisdiction for managing the harvest of Dolphin and Union caribou in Nunavut. Therefore, the Government of Nunavut and the Government of NWT were responsible to develop the harvest management portion of the Dolphin and Union management plan and its submission to NWMB for approval.
- The harvest management recommendations are based on the population size (high, increasing, declining, and low), as well as taking in consideration other indicators such as recruitment, pregnancy rate, sex ratio.
- This harvest management is based on the population cycle, which recognized the Dolphin and Union herd being a small herd with an historic high agreed at 40,000 animals and where Inuit harvest restrictions might be considered when the herd falls to 20% of the high, below 8,000 animals.
- The Kugluktuk and Cambridge Bay HTO has already imposed voluntary management actions following discussion happen during the Management Plan consultation process:
  - Kugluktuk has a motion to suspend all caribou commercial and sport hunts.
  - Cambridge Bay HTO is reducing the number of tag allocating to sport hunt.
  - There is no commercial harvest of Dolphin and Union caribou herd in Nunavut.
  - Increase in educational and public awareness on the Dolphin and Union programs (HTOs and GN).
- The Department has engaged with and continues to work closely with the affected communities and respective co-management partners (NTI, HTOs, KRWB) and GNWT on management actions needed and to monitor the Dolphin and Union caribou herd.

## **Consultations:**

#### Face-to-face:

- February 18, 2015: Introductory meeting in Yellowknife and phone. Participants: Kugluktuk HTO, Umingmaktok HTO, Ekaluktutiak HTO, Gjoa Haven HTO, KRWB, NTI, ECCC and GN.
- March 25-27, 2015: First Joint Meeting in Kugluktuk (NU). Participants: Kugluktuk HTO, Ekaluktutiak HTO, KRWB, NTI, KIA, ECCC, and GN. (See Appendix I)
- October 26, 2015: Framework Review Teleconference. Participants: Burnside HTO, Ekaluktutiak HTO, KRWB, NTI, KIA, NWMB, ECCC, and GN
- January 11-13, 2016: Second Joint Meeting in Cambridge Bay (NU). Participants: Kugluktuk HTO, Burnside HTO, Ekaluktutiak HTO, KRWB, NTI, ECCC, and GN. (See Appendix II)
- February 8, 2016: Threat Calculator Exercise Teleconference. Participants: Ekaluktutiak HTO, KRWB, ECCC and GN.
- April 19, 2016: Draft Consultation with the Ekaluktutiak HTO and Community of Cambridge Bay. Participants: Ekaluktutiak HTO, Burnside HTO, ECCC and GN.
- April 28, 2016: Draft Consultation with the Kugluktuk HTO and Community of Kugluktuk. Participants: Kugluktuk HTO, ECCC and GN.

#### Written:

- June 3, 2016: First jurisdictional technical review. Send the management plan to all HTOs
- September 2, 2016: Second jurisdictional technical review. Send the management plan to all HTOs.
- March 30 to May 29, 2017: 60-day public comment period. Send the management plan to all HTOs, NTI, NWMB.

#### **Accommodations:**

- After each round of consultation on the draft management plan, a comment table was developed in a transparent approach to highlight how each comment from the co-management partners was addressed and the following responses in the management plan.

#### **Recommendation**

- GN-DOE request decision to support or not the Dolphin and Union management plan and its recommendations for the Dolphin and Union caribou herds.

# Proposed final Management Plan for Dolphin and Union Caribou

“Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada: Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut”.



Government of  
Northwest Territories



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September 2017

# Dolphin and Union Caribou Management – A Shared Responsibility

- Many groups share responsibilities to manage Dolphin and Union caribou
  - Nunavut Land Claim Agreement & Inuvialuit Final Agreement
  - Inuit and Inuvialuit organizations
  - Governments of Nunavut, NWT & Canada
  - Species at risk legislation – federal and NWT

## Joint management planning

- A common vision & approach to managing this shared population
- Reinforce management similarity between groups
- Increase coordination & cooperation
- Avoid duplication of effort



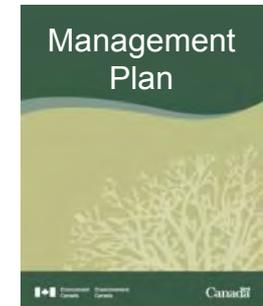
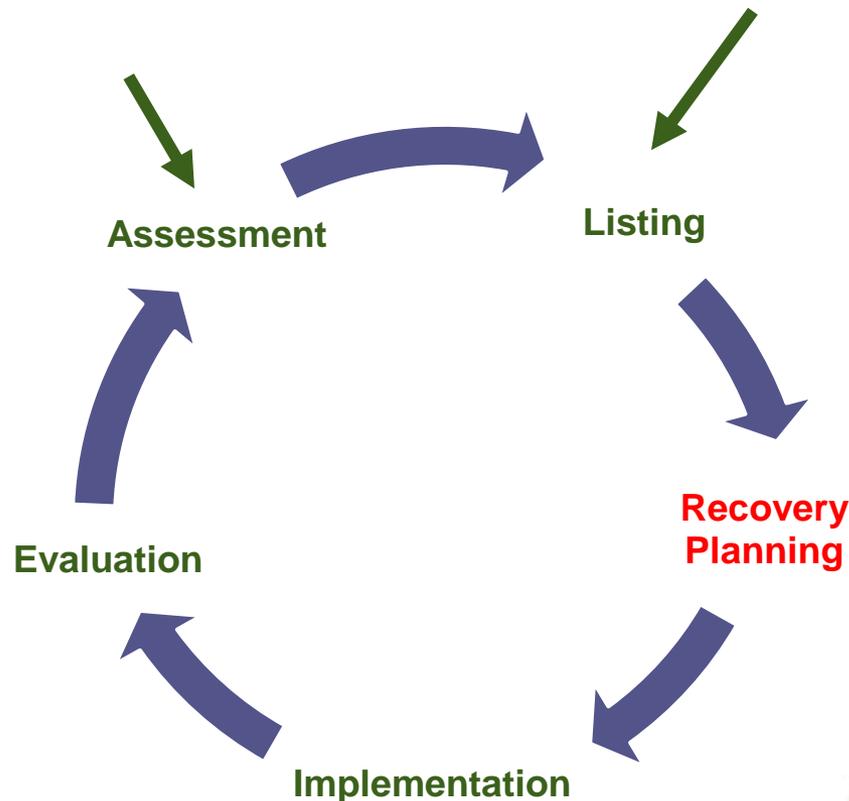
# Species at Risk Processes for Canada – Dolphin and Union Caribou

COSEWIC assessed as  
Special Concern (2004)

Listed as Special  
Concern under SARA  
(2011)

Species of special concern

is a wildlife species that  
could become threatened  
or endangered because of  
a combination of biological  
characteristics and  
identified threats.



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# Requirements for Dolphin and Union Caribou Management Plan in different Jurisdictions

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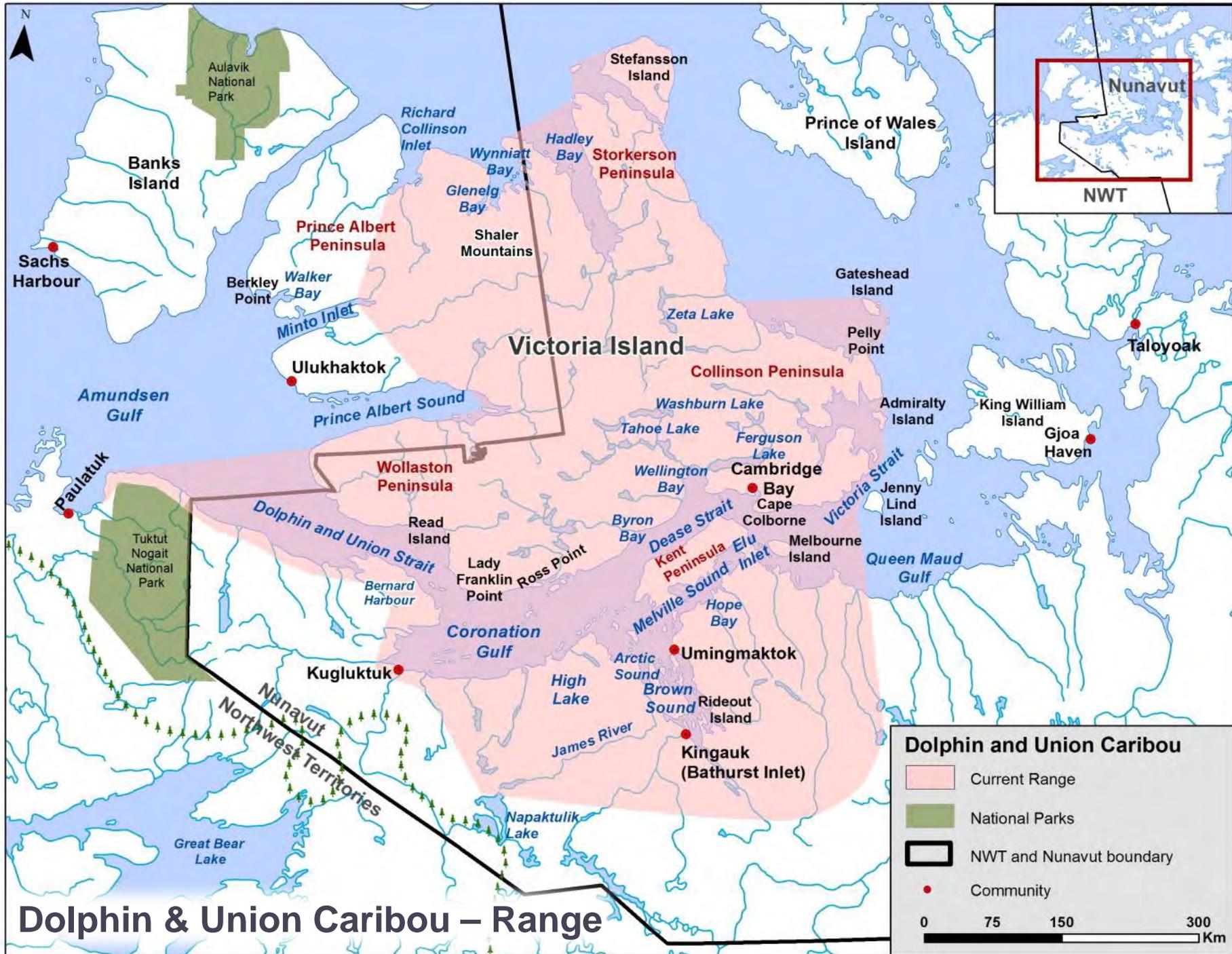
- Environment and Climate Change Canada (ECCC) must produce a management plan under the federal Species At Risk Act.
- In cooperation with the Government of Nunavut and the Government of Northwest Territories, all three jurisdictions worked together towards creating a management plan for Dolphin and Union caribou
- ECCC does not have jurisdiction for managing the harvest of Dolphin and Union caribou. Therefore, ECCC will adopt the joint management plan, with the exception of the harvest management portion (section 6) which will be left to the Governments of Nunavut and NWT for implementation.
- Government of the NWT and the Wildlife Management Advisory Council (NWT) will develop an agreement on accepting the plan
- NWMB should review the management plan for decision to approve or not the management plan.

# Dolphin & Union Caribou – Description

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- Best identified using a combination of characteristics
  - Short muzzles with short, wide hooves, but slightly narrower than Peary caribou
  - Characteristic pelage of Peary caribou, but slightly darker
  - Larger and thicker antlers than Peary caribou
  - Grey antler velvet
- Migrate in the fall and spring between Victoria Island and the mainland





# Population Sizes and Trends

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- Some community members need to travel farther now to harvest caribou, and recent research indicates a decline in the population
- First population estimate in 1997 of  $34,558 \pm 6,801$  caribou, and the second estimate in 2007 of  $27,787 \pm 7,537$  caribou.
- 2015 assessment: estimate of  $18,413 \pm 6,795$  caribou, which inform of a declining trend in the population.



# Dolphin and Union Caribou – Threats in Canada

- Overall threat impact for Dolphin and Union caribou is **Very High – High**

THREAT	IMPACT
Marine traffic	High
Competition and Predation	High - Low
Harvest	Medium - Low
Parasites, Diseases & Insect harassment	Medium - Low
Climate Change	Medium - Low
Resource extraction	Low
Roads and Railroads; Flight Paths	Low
<i>Human Disturbance; Residential and Commercial Development; Utility and Service Lines</i>	<i>Negligible</i>
<i>Interbreeding</i>	<i>Unknown</i>
<i>Oil and Gas Drilling; War, Civil Unrest and Military Exercises; Garbage and Solid Waste</i>	<i>Impact not calculated</i>

# Threats in Canada

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- Year-round marine traffic could prevent spring and fall migrations, delay crossings, or increase the risk of drowning
- Climate change
  - Sea ice loss can cause caribou drowning or dying soon after emerging from water, increase staging time, or prevent movement across ice.
  - Vegetation may change, and icing events may increase.
- Predation and competition
  - Wolves are the main predator. Grizzly bears may have a limited impact on caribou.
  - Either avoid or share habitat with muskoxen depending on the area.
  - Overabundant geese could destroy caribou habitat.
- Harvesting is occurring; however the levels are currently unknown and reporting is not mandatory but on a voluntary basis.

# Threats in Canada

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- Diseases could be spread through contact with muskoxen and other caribou, while climate change is causing new/more insects/parasites in the Arctic and increased insect harassment to caribou
- Scheduled flights could disturb caribou and Extraction projects and Roads could impact migration routes and winter feeding grounds
- Timing and flight height of unscheduled flights are a concern, particularly over calving grounds
- Unclear what impact interbreeding with other caribou species will have on Dolphin and Union caribou

# Management Goal

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Recognizing the ecological, cultural and economic importance of Dolphin and Union Caribou, the goal of this management plan is to maintain the long term persistence of a healthy and viable Dolphin and Union Caribou population that moves freely across its current range and provides sustainable harvest opportunities for current and future generations.



# Management Objectives & Approaches

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There are five management objectives:

1. Adaptively co-manage Dolphin and Union (DU) Caribou using a community-based approach.
2. Communicate and exchange information on an ongoing basis between parties to ensure a collaborative and coordinated approach.
3. Collect information to fill knowledge gaps on DU Caribou using IQ and TK, community monitoring, and scientific methods.
4. Minimize disturbance to habitat and preserve sea ice crossings to maintain the ability of Dolphin and Union Caribou to move freely across their range.
5. Ensure management is based on population level so future generations can benefit from sustainable harvesting opportunities.



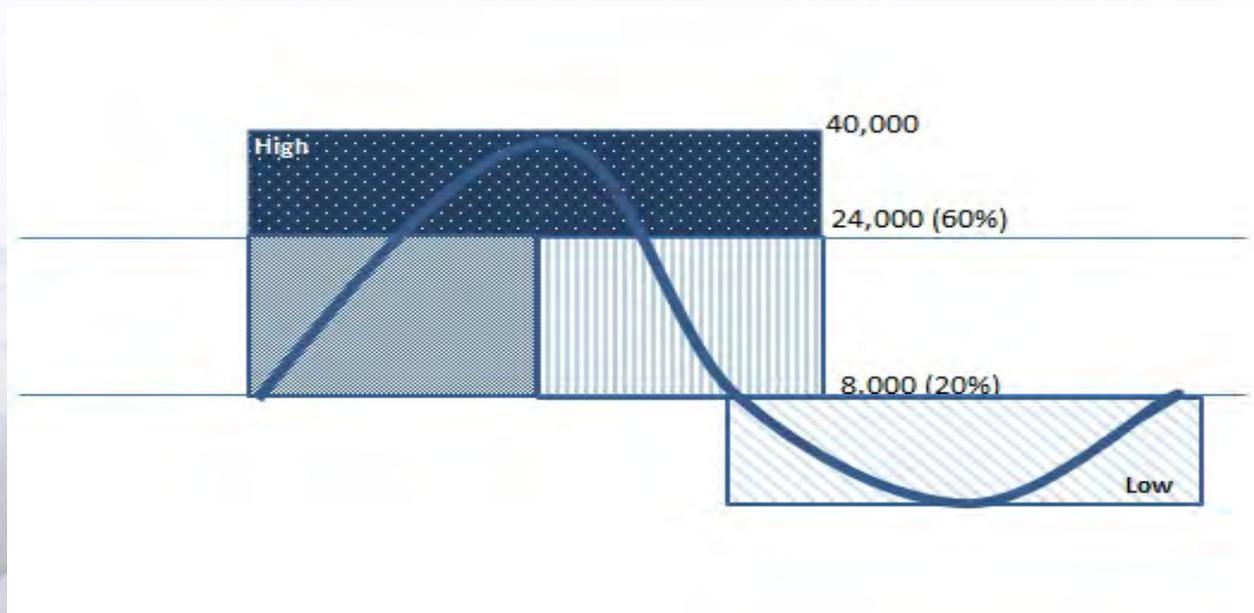
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## ***Section 6.6 Managing Based on Population Level***

# Management Actions Based on Population Level

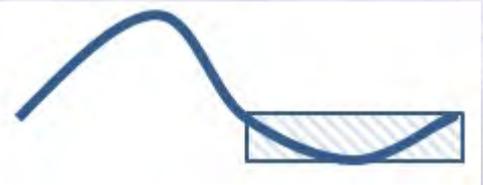
- For each phase of the Dolphin-Union caribou population cycle, the management plan recommends certain actions, including harvest management, to reflect the conservation issues.

## Population Size



- Other indicators such as climate change, recruitment, and changes to distribution, will also be considered

# Management Action Examples

<p>High</p> 	<ul style="list-style-type: none"> <li>• Educate harvesters and youth on how to harvest respectfully.</li> <li>• No harvest restrictions on beneficiaries.</li> <li>• Support reporting of harvest and community-based monitoring programs.</li> <li>• Working group of stakeholders meets.</li> </ul>
<p>Decreasing</p> 	<ul style="list-style-type: none"> <li>• Educate and integrate information into the school system (ex. importance of using the whole caribou).</li> <li>• Increase research and monitoring; have sample kits to monitor harvest.</li> <li>• The working group of stakeholders should meet more frequently.</li> </ul>
<p>Low</p> 	<ul style="list-style-type: none"> <li>• Educate people on the new restriction and management in place.</li> <li>• Consider establishing effective mandatory mechanisms to reduce overall harvest.</li> <li>• Support reporting of harvest and community-based monitoring program.</li> </ul>
<p>Increasing</p> 	<ul style="list-style-type: none"> <li>• Easing of harvest restrictions and consider implementing non-quota limitation.</li> <li>• Encourage research on predators and ease management of predators.</li> <li>• Maintain industry restrictions.</li> <li>• Working group of stakeholders meets.</li> </ul>

# Consultation Process

Date	Meeting <i>Meeting Lead Organization</i>	Attendance by Nunavut Organizations
2014 December 8	<b>Threat Calculator Exercise - Teleconference</b> <i>ECCC</i>	<b>Kugluktuk HTA, KRWB, GN</b> <i>(also invited: Ekaluktutiak HTA, Burnside HTA, NTI, NWMB)</i>
2015	February 18	<b>Introductory Meeting – Yellowknife, NT and Phone</b> <i>ECCC</i>
	March 25-27	<b>First Joint Meeting – Kugluktuk, NU</b> <i>GN, GNWT, ECCC</i>
	October 26	<b>Framework Review – Teleconference</b> <i>GN, GNWT</i>



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# Consultation Process

Date	Meeting <i>Meeting Lead Organization</i>	Attendance by Nunavut Organizations
2016 January 11-13	<b>Second Joint Meeting – Cambridge Bay, NU</b> <i>GN, GNWT, ECCC</i>	<b>Kugluktuk HTA, Burnside HTA, Ekaluktutiak HTA, NTI, KRWB, GN</b> <i>(also invited: Omingmaktok HTA, NWMB)</i>
February 8	<b>Threat Calculator Exercise – Teleconference</b> <i>ECCC</i>	<b>Ekaluktutiak HTA, KRWB, GN</b> <i>(also invited: Kugluktuk HTA, Omingmaktok HTA, Burnside HTA, NTI, KIA, NWMB)</i>
April 19	<b>Draft Consultation with the Ekaluktutiak HTA and Community of Cambridge Bay, NU</b> <i>GN, ECCC</i>	<b>Ekaluktutiak HTA, Burnside HTA, GN</b>
April 28	<b>Draft Consultation with the Kugluktuk HTA and Community of Kugluktuk, NU</b> <i>GN, ECCC</i>	<b>Kugluktuk HTA, GN</b>

# Consultation Process/Results

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- Community consultations were conducted in April 2016
  - Incorporated feedback into draft management plan
  - The meeting comment table (Appendix III) was updated to show how comments were reviewed and/or incorporated into the document and returned to the HTOs.
- ECCC sent the draft document to the NWMB on **June 3, 2016** for the first jurisdictional technical review. GN sent the document to the HTOs.
- ECCC sent the proposed document to the NWMB on **September 2, 2016** for the second jurisdictional technical review. GN sent the document to the HTOs.
- ECCC posted the proposed document from **March 30 to May 29, 2017**, on the public registry for a 60-day public comment period. ECCC sent the document to the HTOs, NTI and NWMB.
- ECCC sent a questionnaire asking for approval of the proposed document to the Kugluktuk and Ekaluktutiak HTOs, and neither raised objections.

# Changes to the Management Plan

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- Many comments received from the reviews were minor edits and suggestions to re-organize information within the plan
- Some of the major changes to the plan include:
  - Information about the 2015 population estimate was added.
  - An additional knowledge gap was added: Potential impact of future development on Dolphin and Union caribou. The Knowledge gaps were prioritized.
  - A 'Threats and/or knowledge gaps addressed' column was added on the 'Approaches to Management' table to link back to the initial reason for concern and how concerns are addressing.
  - A new section was added, 'Measuring Progress', to define and measure progress toward achieving the management goal.
- A summary of the changes to each section of the plan was provided to NWMB in a separate document

# The Government of Nunavut and ECCC request of the Board

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GN-DoE and ECCC request decision to approve or  
not the proposed final Dolphin and Union Caribou  
Management Plan  
(as per the Nunavut Land Claims Agreement  
s.5.2.34)



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of Canada

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du Canada

## Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada: Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus* x *pearyi*) in the Northwest Territories and Nunavut.

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Environment and Climate Change Canada (ECCC) does not have jurisdiction for managing the harvest of Dolphin and Union Caribou. Therefore, ECCC will adopt the joint management plan, with the exception of the harvest management portion (section 6.6), which will be left to the Governments of Nunavut and NWT for implementation.

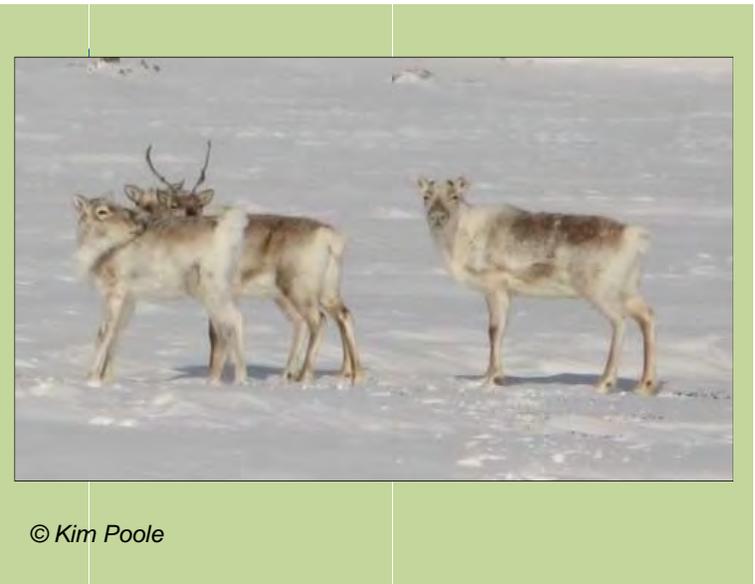
The Government of Nunavut, the Department of Environment, will adopt this joint management plan in totality and seek additional approval for the implementation of the harvest management portion of the plan (section 6.6), in the Territory of Nunavut.



# PROPOSED FINAL MANAGEMENT PLAN FOR DOLPHIN AND UNION CARIBOU

## Summary

This is a summary of the information provided in the recovery document Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada: Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut. The common name used in the management plan is Dolphin and Union Caribou. Under the federal *Species at Risk Act*, Dolphin and Union Caribou was listed as Special Concern in 2011.



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The management plan is a document that sets the goals and objectives for maintaining sustainable population levels for Dolphin and Union Caribou. This plan is intended to provide guidance and direction to the co-management partners to help them with their decision-making for Dolphin and Union Caribou management.

This summary is based on the information in the full English version of the Dolphin and Union Caribou management plan. The original English copy of the management plan has been provided for reference.

## Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Assessment and Species Status Information

These pages provide the COSEWIC assessment table which is included here. It describes why COSEWIC has assessed Dolphin and Union Caribou.

**Date of Assessment:** May 2004

**Common Name (population):** Barren-ground caribou (Dolphin and Union population)

**Scientific Name:** *Rangifer tarandus groenlandicus*

**COSEWIC Status:** Special Concern

**Reason for Designation:** This population of caribou is endemic to Canada. Once thought to be extinct, numbers have recovered to perhaps a quarter of the population historic size. They have not been censused since 1997 and are subject to a high rate of harvest, whose sustainability is questioned by some. They migrate between the mainland and Victoria Island and climate warming or increased shipping may make the ice crossing more dangerous. The population, however, increased substantially over the last three generations and was estimated at about 28000 in 1997.

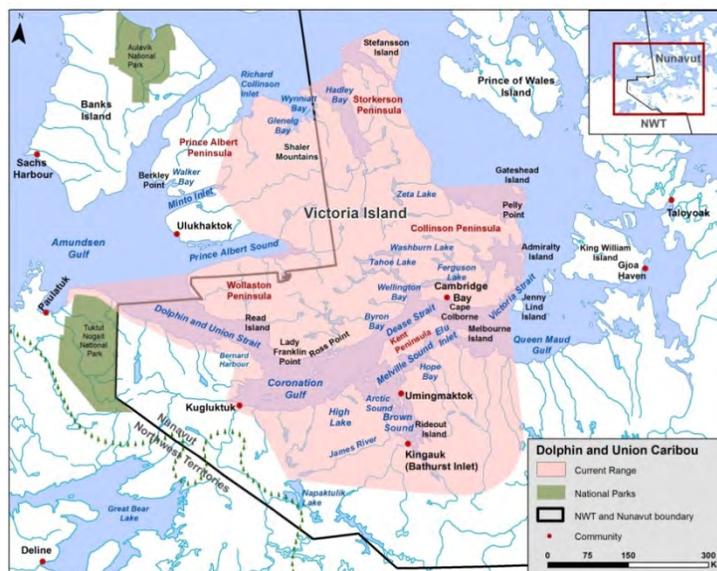
**Occurrence:** Northwest Territories, Nunavut

**COSEWIC 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, *Rangifer tarandus pearyi*, was assessed separately from the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. The Dolphin and Union Caribou is comprised of a portion of the former "Low Arctic population", and it was designated Special Concern in May 2004.

This section also provides information on the status of the species throughout Canada, how it is protected in the Provinces and Territories and what rank of protection it has, and other types of protection that are provided to the species.

## Information about Dolphin and Union Caribou

This section of the draft recovery document for Dolphin and Union Caribou provides some information such as what they look like, where they live, and what they need to survive.



This is Figure 4 from the draft recovery document. It shows the current range of Dolphin and Union Caribou in NU and NT. They migrate in the fall and spring between the mainland and Victoria Island. These migrations make seasonal connectivity of sea ice a key habitat requirement.

- Dolphin and Union Caribou look and behave differently from other Barren-ground Caribou populations and from Peary Caribou.
- Dolphin and Union Caribou have short muzzles and short, wide hooves that are slightly

narrower than Peary Caribou. Their coat pattern is similar to Peary Caribou but slightly darker, and their antlers are larger and thicker than Peary Caribou.

- This species play an essential role in the lives of the Inuit and Inuvialuit people. They are highly valued from a spiritual, economic, cultural and subsistence harvest perspective.
- Dolphin and Union Caribou are harvested by the communities of Kugluktuk, Umingmaktok, Bathurst Inlet and Paulatuk during the winter, Ulukhaktok in the summer/fall, and Cambridge Bay in both seasons.
- In spring, this species begin moving northward to the coast for their migration to Victoria Island and ancillary islands.
- In summer, Dolphin and Union Caribou spread out across the island to give birth alone or in small groups. They do not gather in large groups to calve or use distinct calving grounds as is common in other Barren-ground Caribou.
- In fall, they migrate to the southern part of Victoria Island to cross the sea ice to their winter range on the mainland.
- In 2015, population estimate was  $18,413 \pm 6,795$ . The population trend is not certain due to lack of information and monitoring.
- *Inuit Qaujimaqatugangit* and local knowledge collected in the community of Ikaluktutiak (Cambridge Bay) on Victoria Island, NU, reported a Dolphin and Union Caribou decline in their area.

## Threats to Dolphin and Union Caribou

This section of the draft recovery document describes the things that might cause the Dolphin and Union Caribou population to drop. The primary threat to Dolphin and Union Caribou is a reduction in sea ice connectivity that results both from shipping or ice-breaking activities, and from sea ice loss due to climate change. A decrease in sea ice connectivity limits their range access, in particular access to migratory routes. It also increases the risk of caribou drowning. The main threats are:

- **Shipping Lanes** – Marine traffic & Ice breaking. An increase in shipping traffic when sea ice is forming or during the ice season poses a grave threat to Dolphin and Union Caribou by preventing or delaying crossings, or increasing the risk of drowning. The threat is aggravated by an extended shipping season (due to a shorter sea ice season) that allows more access through the straits for marine traffic (e.g. Northwest Passage).
- **Sea ice loss due to climate change** – Thinner and/or unstable ice cannot support the weight of caribou during their migration. Warming temperatures in the Arctic are causing ice freeze-up to take place later in the fall, and spring thaw to take place earlier in the season. Although caribou can swim, they are unlikely to cross distances longer than a few kilometers and sometimes cannot pull themselves out of the water or die soon after emerging from water.

- **Cumulative impacts of changes to sea ice** – Given their migration patterns, seasonal connectivity of the sea ice between Victoria Island and the mainland is essential to Dolphin and Union Caribou. The combination of marine traffic and climate change can affect ice formation to the point where this species may not be able to migrate.
- **Predation and Competition** – Increased number of wolves and grizzly bears are a threat to Dolphin and Union Caribou. Interactions with muskoxen and overabundant geese may also be a threat.
- **Harvest** – Levels are currently unknown and reporting is not mandatory for subsistence harvest. Harvest can have a greater impact on the population trend when it is declining.
- **Parasites, diseases and insect harassment** – Diseases could be spread through contact with muskoxen and other caribou, while climate change is causing new/more insects/parasites in the Arctic and increased insect harassment to caribou.
- **Other impacts of climate change** – Climate change may cause vegetation changes. Also, events such as freeze-thaw, freezing rain, snowfall may increase and reduce access to forage.

Climate change is an underlying driver of many of these threats. Mining, roads and flights also present threats to Dolphin and Union Caribou.

## Management Goal and Objectives

The goal of this management plan is to maintain the long term persistence of a healthy and viable

Dolphin and Union Caribou population that moves freely across its current range and provides sustainable harvest opportunities for current and future generations.

Achieving the management goal would allow for a population level sufficient to sustain traditional Indigenous harvesting activities, and one that is consistent with land claim agreements and existing treaty rights of the Indigenous Peoples of Canada.

In order to attain this goal, five objectives were established:

**Objective 1** – Adaptively co-manage Dolphin and Union Caribou using a community-based approach.

**Objective 2** – Communicate and exchange information on an ongoing basis between parties using a collaborative and coordinated approach.

**Objective 3** – Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ and TK, community monitoring and scientific methods.

**Objective 4** – Minimize disturbance to habitat and preserve sea ice crossings to maintain the ability of Dolphin and Union Caribou to move freely across their range.

**Objective 5** – Ensure management is based on population level so future generations can benefit from sustainable harvesting opportunities.

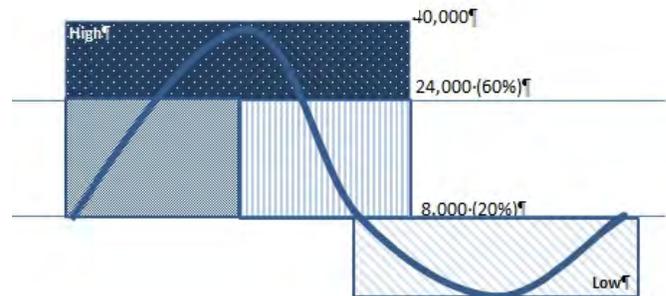
These objectives and their corresponding approaches apply broadly across the population's range in both Northwest Territories and Nunavut. More details can be found in the recovery document.



## Managing Based on Population Level

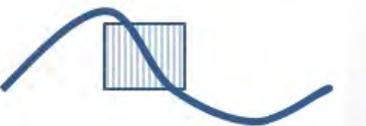
This management plan also recommends a framework describing how management actions should be adapted at different phases in the Dolphin and Union Caribou cycle, according to when the population is increasing, high, decreasing or low. For each population level, the management actions recommended was based on intensive round of consultation with the communities and co-management partners.

### Population Level:



Dolphin and Union Caribou cycles: Determining the location of the Dolphin and Union Caribou population within its cycle.

Such management examples include:

<p><b>High</b></p> 	<ul style="list-style-type: none"> <li>• Educate harvesters and youth on how to harvest respectfully.</li> <li>• No harvest restrictions on beneficiaries.</li> <li>• Support reporting of harvest and community-based monitoring programs.</li> <li>• Working group of stakeholders meets.</li> </ul>
<p><b>Decreasing</b></p> 	<ul style="list-style-type: none"> <li>• Educate and integrate information into the school system (ex. importance of using the whole caribou).</li> <li>• Increase research and monitoring; have sample kits to monitor harvest.</li> <li>• The working group of stakeholders should meet more frequently.</li> </ul>
<p><b>Low</b></p> 	<ul style="list-style-type: none"> <li>• Educate people on the new restriction and management in place.</li> <li>• Consider establishing effective mandatory mechanisms to reduce overall harvest.</li> <li>• Support reporting of harvest and community-based monitoring program.</li> </ul>
<p><b>Increasing</b></p> 	<ul style="list-style-type: none"> <li>• Easing of harvest restrictions and consider implementing non-quota limitation.</li> <li>• Encourage research on predators and ease management of predators.</li> <li>• Maintain industry restrictions.</li> <li>• Working group of stakeholders meets.</li> </ul>

Management Plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population, in Canada:

Adoption of the Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut

Barren-ground Caribou, Dolphin and Union population



2017

**Recommended citation:**

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For copies of the management plan or for additional information on species at risk, including the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the [Species at Risk \(SAR\) Public Registry](http://sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1)<sup>1</sup>.

**Cover photo:** © Kim Poole

Également disponible en français sous le titre  
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ISBN

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<sup>1</sup> <http://sararegistry.gc.ca/default.asp?lang=En&n=24F7211B-1>

# MANAGEMENT PLAN FOR THE BARREN-GROUND CARIBOU (*Rangifer tarandus groenlandicus*), DOLPHIN AND UNION POPULATION, IN CANADA

2017

Under the Accord for the Protection of Species at Risk (1996), the federal, provincial, and territorial governments agreed to work together on legislation, programs, and policies to protect wildlife species at risk throughout Canada.

In the spirit of cooperation of the Accord, the *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut* was prepared jointly by the Government of Nunavut and the Government of the Northwest Territories, in cooperation with the Government of Canada and co-management partners. The Government of Canada adopts this management plan (Part 2) under section 69 of the *Species at Risk Act* (SARA). Environment and Climate Change Canada has included a federal addition (Part 1) which completes the SARA requirements for a management plan.

The federal management plan for the Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population<sup>2</sup>, in Canada consists of two parts:

Part 1 – Federal Addition to the *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut*, prepared by Environment and Climate Change Canada.

Part 2 – *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut [Proposed Final Management Plan for Approval]*, prepared by the Government of the Northwest Territories – Department of Environment and Natural Resources and the Government of Nunavut – Department of Environment, in cooperation with the Government of Canada – Environment and Climate Change Canada.

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<sup>2</sup> At the time of document publication, the species is listed on Schedule 1 of the *Species at Risk Act* as Barren-ground Caribou (*Rangifer tarandus groenlandicus*), Dolphin and Union population. It is currently referred to as the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus*) by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC 2011) and is referred to as the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) by the Northwest Territories. All three names refer to the same population.

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Part 2 – *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut*, prepared by the Government of the Northwest Territories, Department of Environment and Natural Resources; the Government of Nunavut, Department of Environment, in cooperation with the Government of Canada, Environment and Climate Change Canada.

**Part 1 – Federal Addition to the *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut*, prepared by Environment and Climate Change Canada**

## Preface

The federal, provincial, and territorial government signatories under the [National Accord for the Protection of Species at Risk \(1996\)](#)<sup>3</sup> agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of management plans for listed species of special concern and are required to report on progress within five years after the publication of the final document on the SAR Public Registry.

The Minister of Environment and Climate Change and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Barren-ground Caribou, Dolphin and Union population, and has prepared the federal component of this management plan (Part 1), as per section 65 of SARA. To the extent possible, it has been prepared in cooperation with the Government of the Northwest Territories, the Government of Nunavut, the Wildlife Management Advisory Council (NWT), and the Nunavut Wildlife Management Board, as per section 66(1) of SARA. SARA section 69 allows the Minister to adopt all or part of an existing plan for the species if the Minister is of the opinion that an existing plan relating to wildlife species includes adequate measures for the conservation of the species. The Government of Nunavut, Government of the Northwest Territories and Government of Canada provided the attached management plan for the Dolphin and Union population of Barren-ground Caribou (Part 2) as a guide to the jurisdictions responsible for managing the species in the Northwest Territories and Nunavut. The management plan was prepared in cooperation with communities, hunters and trappers organizations/ committees, wildlife management boards, territorial governments, federal departments and organizations within the range of Barren-ground Caribou, Dolphin and Union population.

Success in the conservation of this species depends on the commitment and cooperation of many different constituencies that will be involved in implementing the directions set out in this plan and will not be achieved by Environment and Climate Change Canada, the Parks Canada Agency, or any other jurisdiction alone. All Canadians are invited to join in supporting and implementing this plan for the benefit of Barren-ground Caribou, Dolphin and Union population, and Canadian society as a whole.

Implementation of this management plan is subject to appropriations, priorities, and budgetary constraints of the participating jurisdictions and organizations.

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<sup>3</sup> <http://registrelep-sararegistry.gc.ca/default.asp?lang=en&n=6B319869-1#2>

## **Additions and Modifications to the Adopted Document**

This section has been included to address specific requirements of the federal *Species at Risk Act* (SARA) that are not addressed in the *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut* (Part 2 of this document) and/or to provide updated or additional information.

Under SARA, prohibitions regarding the protection of species and their habitat do not apply to species of special concern. Conservation measures in the territorial management plan dealing with the protection of individuals and their habitat are still adopted to guide conservation efforts but would not result in federal legal protection.

The competent Ministers are not adopting section 6.6 “Managing Based on Population Status (Level)”. The implementation of the management approaches for harvest is under the jurisdiction of the territorial governments and co-management boards.

**Part 2 – *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x pearyi) in the Northwest Territories and Nunavut [Proposed Final Management Plan for Approval]*, prepared by the Government of the Northwest Territories – Department of Environment and Natural Resources, the Government of Nunavut – Department of Environment, in cooperation with the Government of Canada – Environment and Climate Change Canada**

1                                   **Management Plan for the**  
2                                   **Dolphin and Union Caribou**  
3                                   **(*Rangifer tarandus groenlandicus x pearyi*)**  
4                                   **in the Northwest Territories and Nunavut**  
5                                   **Proposed Final Management Plan for Approval**  
6                                   **July 2017**  
7



8  
9  
10 REMOVE before finalizing

11 This draft management plan was prepared jointly by the Government of Nunavut (GN)  
12 and the Government of the Northwest Territories (GNWT), in cooperation with the  
13 Government of Canada and co-management partners.

The GNWT, WMAC (NWT), GN and NWMB (NU) are asked to consider accepting this plan. In the final version of the management plan, it is anticipated that the NWT and Nunavut partners will add their logos here once this document is finalized and approved.

Once the Plan is complete it is expected that the plan will be accepted, maybe with some amendments, under the *Species at Risk (NWT) Act* and the federal *Species at Risk Act*.

14 Copies of the management plan are available at [www.nwtspeciesatrisk.ca](http://www.nwtspeciesatrisk.ca) and  
15 [www.gov.nu.ca/environment](http://www.gov.nu.ca/environment)

16

17 **This document is a draft and should not be cited without permission from the**  
18 **Government of Nunavut and Government of Northwest Territories.**

19 All rights reserved.

20 ISBN to come.

21

22 This management plan recognizes and respects the intellectual property rights of the *Inuit*  
23 *Qaujimajatuqangit* holders, traditional knowledge holders, elders, hunters and others who  
24 shared their knowledge to develop this document. The information shared by individuals at  
25 joint planning workshops and at hunters and trappers committee /organization meetings  
26 cannot be referenced in other documents without the expressed permission of the  
27 individual, hunters and trappers committee /organization or other organization that  
28 provided the information. This applies to comments cited from: Ulukhaktok Traditional  
29 Knowledge interviews 2011-2013; Tuktoyaktuk Community Meeting 2014; First Joint  
30 Meeting 2015; Second Joint Meeting 2016; Ekaluktutiak Hunters and Trappers  
31 Organization 2016; Kugluktuk Hunters and Trappers Organization 2016; Paulatuk Hunters  
32 and Trappers Committee 2016; and Olohaktomiut Hunters and Trappers Committee 2016.

33

34 **Cover photo:** Dolphin and Union Caribou at High Lake, Nunavut, April 2008. Credit: K.  
35 Poole.

## 36 **PREFACE**

37 The *Management Plan for the Dolphin and Union Caribou (Rangifer tarandus groenlandicus x*  
38 *pearyi) in the Northwest Territories and Nunavut* describes the management goals and  
39 objectives for Dolphin and Union Caribou and recommends approaches to achieve those  
40 objectives.

41 This plan was developed to meet the requirements for a Northwest Territories  
42 management plan under the territorial *Species at Risk (NWT) Act* as well as a national  
43 management plan under the federal *Species at Risk Act*, and to meet management needs in  
44 Nunavut. Development of the management plan respected co-management processes  
45 legislated by the *Inuvialuit Final Agreement* and the *Nunavut Land Claims Agreement*.

46 The management plan was prepared jointly by the Government of Nunavut and the  
47 Government of the Northwest Territories, in cooperation with the Government of Canada  
48 and co-management partners. Co-management partners involved in this process include:  
49 the Nunavut Wildlife Management Board, Kitikmeot Regional Wildlife Board, Nunavut  
50 Tunngavik Inc., Kitikmeot Inuit Association, Kugluktuk Hunters and Trappers Organization  
51 (HTO), Ekaluktutiak HTO, Omingmaktok HTO, Burnside HTO, Wildlife Management  
52 Advisory Council (NWT), Inuvialuit Game Council, Ulukhaktok Hunters and Trappers  
53 Committee (HTC), and the Paulatuk HTC.

54 Success in the management of this population depends on the commitment and  
55 collaboration of the many different constituencies that are involved in implementing the  
56 directions set out in this plan and will not be achieved by any group or jurisdiction alone.  
57 All Canadians are invited to join in supporting and implementing this plan for the benefit of  
58 the Dolphin and Union Caribou, and Canadian society as a whole.

59 This management plan does not commit any party to actions or resource expenditures;  
60 implementation of this plan is subject to appropriations, priorities, and budgetary  
61 constraints of the participating jurisdictions and organizations.

62

63 **ACCEPTANCE STATEMENT**

64

65 Each participating management agency to provide appropriate text that reflects their acceptance  
66 of the plan. For the NWT, insert text from the Conference of Management Authorities consensus  
67 agreement.

68 **To be completed as a final step once the management plan is finalized.**

## 69 **ACKNOWLEDGMENTS**

70 Preparation of this document was funded by the Government of Canada (GC), Environment  
71 and Climate Change Canada; Government of Nunavut (GN), Department of Environment;  
72 and the Government of the Northwest Territories (GNWT), Department of Environment  
73 and Natural Resources. The principal writers of this document were Lisa Worthington,  
74 Species at Risk Recovery Planning Coordinator, GNWT; Amy Ganton, Species at Risk  
75 Biologist, GC; Lisa-Marie Leclerc, Regional Biologist, Kitikmeot Region, GN; Tracy Davison,  
76 Regional Biologist, GNWT; Joanna Wilson, Wildlife Biologist (Species at Risk), GNWT; and  
77 Isabelle Duclos, Species at Risk Biologist, GC.

78 A working group was established to develop the management plan, and the following  
79 members participated, in addition to the names listed above:

- 80 • Jimmy Haniliak – Ekaluktutiak Hunters and Trappers Organization
- 81 • Philip Kadlun, Colin Adjun, Jorgen Bolt and Larry Adjun – Kugluktuk Hunters and  
82 Trappers Organization
- 83 • Sam Kapolak – Burnside Hunters and Trappers Organization
- 84 • Luigi Toretti and Tannis Bolt – Kitikmeot Inuit Association
- 85 • David Lee and Bert Dean – Nunavut Tunngavik Incorporated
- 86 • James Qitsualik Taqaugak, Ema Qaqqutaq and Simon Qingnaqtug – Kitikmeot Regional  
87 Wildlife Board
- 88 • Mathieu Dumond, Myles Lamont and Drikus Gissing – GN
- 89 • Joshua Oliktoak – Olohaktomiut Hunters and Trappers Committee and the Inuvialuit  
90 Game Council
- 91 • Joe Ilasiak – Paulatuk Hunters and Trappers Committee and the Inuvialuit Game  
92 Council
- 93 • John Lucas Jr. and Charles Pokiak – Wildlife Management Advisory Council (NWT)
- 94 • Jan Adamczewski – GNWT
- 95 • Donna Bigelow – GC

96 The following organizations provided additional input and comments that improved the  
97 management plan:

- 98 • Ekaluktutiak Hunters and Trappers Organization
- 99 • Kugluktuk Hunters and Trappers Organization
- 100 • Olohaktomiut Hunters and Trappers Committee
- 101 • Paulatuk Hunters and Trappers Committee
- 102 • Kugluktuk Community Elders
- 103 • GN
- 104 • Wildlife Management Advisory Council (NWT)
- 105 • GNWT
- 106 • GC
- 107 • Committee on the Status of Endangered Wildlife in Canada (COSEWIC)

108

## 109 **EXECUTIVE SUMMARY**

### 110 **Management Planning for Dolphin and Union Caribou**

111 Dolphin and Union Caribou play an essential role in the lives of the Inuit and Inuvialuit  
112 people. They are highly valued from a spiritual, economic, cultural and harvest perspective.  
113 They are also a species of special concern under the federal *Species at Risk Act* (SARA) and  
114 the Government of the Northwest Territories *Species at Risk (NWT) Act*.

115 It is essential to have a plan to sustain this population to help ensure the survival of  
116 Dolphin and Union Caribou for future generations. This plan describes management goals  
117 and objectives for Dolphin and Union Caribou as well as recommended approaches to  
118 achieve those objectives. This plan was developed collaboratively by co-management  
119 partners to meet management needs in Nunavut, Northwest Territories and at the national  
120 level. It recognizes the shared responsibilities for management under land claim  
121 agreements and species at risk legislation, and gives equal consideration to *Inuit*  
122 *Qaujimaqatunangit* (IQ), traditional knowledge (TK), and scientific knowledge.

### 123 **Background**

124 Dolphin and Union Caribou are morphologically and behaviourally distinct from other  
125 barren-ground caribou populations and from Peary caribou. They migrate in the fall across  
126 the sea ice from Victoria Island to the mainland, where they spend their winters and in the  
127 spring, they migrate back to Victoria Island where they disperse to calve and raise their  
128 young. These migrations make seasonal connectivity of sea ice a key habitat requirement.

129 Scientific research conducted in 2015 indicates the latest population estimate is  $18,413 \pm$   
130  $6,795$  (95% CI, 11,664-25,182). This indicates a decline in the population. A recent IQ/local  
131 knowledge study in Cambridge Bay also confirmed the perception of such a decline.  
132 Observations from this study included reduced body condition, a decline in the juvenile  
133 population (including calves and yearlings), increased signs of disease and an overall poor  
134 state of health among Dolphin and Union Caribou. Causes of mortality include drowning,  
135 predation, harvest, and disease to name a few.

136 Dolphin and Union Caribou are harvested by the communities of Kugluktuk, Umingmaktok,  
137 Bathurst Inlet and Paulatuk during the winter/spring, Ulukhaktok in the summer/fall, and  
138 Cambridge Bay in both seasons. Distribution of caribou in relation to community  
139 harvesting areas results in different harvest opportunities for each community between  
140 seasons and years.

### 141 **Threats to Dolphin and Union Caribou**

142 Dolphin and Union Caribou are facing substantial threats to population persistence. Their  
143 primary threat is a reduction in sea ice connectivity that results both from ice-breaking  
144 activities and from sea ice loss due to climate change. A decrease in sea ice connectivity  
145 limits their range access, in particular, access to their migratory routes. Predation from

146 wolves and grizzly bears, as well as harvest activities also present threats to Dolphin and  
147 Union Caribou. Other important threats include icing/freeze-thaw events (affecting access  
148 to forage), increased insect harassment and a rise in parasites and diseases. Climate change  
149 is an underlying driver of many of these threats. Mining, roads, flights, and competition  
150 from other species also present threats to Dolphin and Union Caribou.

## 151 **Management Goal and Objectives**

152 Recognizing the ecological, cultural and economic importance of Dolphin and Union  
153 Caribou, the goal of this management plan is to maintain the long term persistence of a  
154 healthy and viable Dolphin and Union Caribou population that moves freely across its  
155 current range and provides sustainable harvest opportunities for current and future  
156 generations.

157 Achieving the management goal would allow for a population level sufficient to sustain  
158 traditional Indigenous harvesting activities, and one that is consistent with land claim  
159 agreements and existing treaty rights of the Indigenous Peoples of Canada.

160 In order to attain this goal, five objectives were established, combined with twelve  
161 recommended approaches to achieve these objectives. These objectives and their  
162 corresponding approaches apply broadly across the population's range in both Northwest  
163 Territories and Nunavut. The approaches to management of the Dolphin and Union Caribou  
164 (Section 6.3) outline the priorities, recommended time frame and performance measures to  
165 complete the management objectives. The management plan will be reviewed every five  
166 years further to legislated guidelines under the federal SARA and the territorial *Species at  
167 Risk (NWT) Act*. However, the adaptive management approach allows for new information  
168 to be incorporated into the management framework and actions throughout this time. The  
169 order in which the objectives are presented here does not indicate, assign, or imply  
170 differential importance.

171 **Objective 1:** Adaptively co-manage Dolphin and Union Caribou using a community-based  
172 approach.

173 **Objective 2:** Communicate and exchange information on an ongoing basis between  
174 parties using a collaborative and coordinated approach.

175 **Objective 3:** Collect information to fill knowledge gaps on Dolphin and Union Caribou  
176 using IQ and TK, community monitoring and scientific methods.

177 **Objective 4:** Minimize disturbance to habitat and preserve sea ice crossings to maintain  
178 the ability of Dolphin and Union Caribou to move freely across their range.

179 **Objective 5:** Ensure management is based on population level so future generations can  
180 benefit from sustainable harvesting opportunities.

181 Harvest management and other management actions should also be informed by the level  
182 and trend of the population. This management plan recommends a framework describing

- 183 how management actions should be adapted at different phases in the Dolphin and Union  
184 Caribou cycle, according to when the population is increasing, high, decreasing, or low.
- 185 There are already some measures in place that assist in managing Dolphin and Union  
186 Caribou, including land claim agreements, legislation, regulations, community conservation  
187 plans, and land use planning.
- 188 This plan is intended to provide guidance and direction to the co-management partners to  
189 help them with their decision-making for Dolphin and Union Caribou management.  
190 Ongoing communications, stakeholder and community participation, and cooperation will  
191 be fundamental to the plan's success.
- 192 The specific actions needed to maintain the Dolphin and Union Caribou population are  
193 provided in an appendix and will be managed by the responsible jurisdictions, consistent  
194 with this management plan.

195 **ACRONYMS**

<b>ATK</b>	Aboriginal Traditional Knowledge
<b>COSEWIC</b>	Committee on the Status of Endangered Wildlife in Canada
<b>DOE</b>	Department of Environment
<b>DU</b>	Designatable Units
<b>EIRB</b>	Environmental Impact Review Board
<b>EISC</b>	Environmental Impact Screening Committee
<b>ENR</b>	Environment and Natural Resources
<b>GC</b>	Government of Canada
<b>GN</b>	Government of Nunavut
<b>GNWT</b>	Government of the Northwest Territories
<b>HTC</b>	Hunters and Trappers Committee
<b>HTO</b>	Hunters and Trappers Organization
<b>IFA</b>	Inuvialuit Final Agreement
<b>IGC</b>	Inuvialuit Game Council
<b>IQ</b>	Inuit Qaujimagatuqangit
<b>ISR</b>	Inuvialuit Settlement Region
<b>IUCN</b>	International Union for the Conservation of Nature
<b>KIA</b>	Kitikmeot Inuit Association
<b>KRWB</b>	Kitikmeot Regional Wildlife Board
<b>NGO</b>	Non-governmental Organization
<b>NLCA</b>	Nunavut Land Claims Agreement
<b>NTI</b>	Nunavut Tunngavik Inc.
<b>NWMB</b>	Nunavut Wildlife Management Board
<b>NWT</b>	Northwest Territories
<b>RWO</b>	Regional Wildlife Organization
<b>TAH</b>	Total Allowable Harvest
<b>TK</b>	Traditional Knowledge
<b>SARA</b>	<i>Species at Risk Act</i>
<b>SARC</b>	Species at Risk Committee (NWT)
<b>SEA</b>	Strategic Environmental Assessment
<b>WMAC (NWT)</b>	Wildlife Management Advisory Council (NWT)

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287

## 288 **1. INTRODUCTION**

289 Dolphin and Union Caribou play an essential role in the lives of the Inuit and Inuvialuit in  
290 Nunavut and the NWT. They are highly valued by the Indigenous Peoples in these regions  
291 from a spiritual, economic, cultural and harvest perspective. Dolphin and Union Caribou  
292 have been harvested for many generations by communities in the Arctic and there is a  
293 sense of responsibility toward stewardship of this caribou population and its habitat.

294 In recognition of threats and declining population trends, as identified by Traditional  
295 Knowledge (TK), Inuit Qaujimagatuqangit (IQ), local knowledge and science, Dolphin and  
296 Union Caribou were listed as Special Concern under the federal *Species at Risk Act* (SARA)  
297 and the Government of the Northwest Territories (GNWT) *Species at Risk (NWT) Act*. Under  
298 these two acts, a management plan must be developed for the Dolphin and Union Caribou.

299 To help ensure the survival of this species, the management plan must respect Indigenous  
300 rights while managing human behaviour. In an effort to promote long term persistence of  
301 Dolphin and Union Caribou, the plan must find a balance between the resources used  
302 today, and the resources available to future generations.

303

## 304 **2. PLAN DEVELOPMENT**

### 305 ***2.1 Purpose and Principles***

306 The Dolphin and Union Caribou management plan facilitates coordination and cooperation  
307 among management partners based on the shared goal, objectives and approaches  
308 established for the population. The plan will assist management partners in assigning  
309 priorities, understanding natural processes impacting caribou, and allocating resources in  
310 order to manage human impacts on this species.

311 Development of the management plan was guided by the shared responsibility to manage  
312 Dolphin and Union Caribou under components of the *Nunavut Land Claims Agreement*  
313 (NLCA), *Inuvialuit Final Agreement* (IFA), federal SARA, and the GNWT *Species at Risk*  
314 (*NWT) Act*. Joint management planning ensured a common vision and approach for the  
315 shared population, and there was an expectation that all management partners would have  
316 the opportunity to contribute. The plan was prepared using the best available IQ, TK, local  
317 and scientific knowledge and each of these perspectives was awarded equal consideration.

### 318 ***2.2 Planning Partners***

319 Planning partners refers to the groups, organizations and communities who are  
320 responsible for managing Dolphin and Union Caribou. Other organizations may be involved  
321 in managing Dolphin and Union Caribou, but they do not have management authority  
322 under land claim agreements or other legislation.

**323 Government of Canada**

324 The **Government of Canada** (GC) has ultimate responsibility for the management of migratory  
325 birds (as described in the *Migratory Birds Convention Act, 1994*), fish, marine mammals, and  
326 other aquatic species (as described in the *Fisheries Act*). It also has responsibilities under the  
327 federal *Species at Risk Act* (SARA), including the implementation and enforcement of protection  
328 for individuals, residences and critical habitat for listed species. The federal Minister of  
329 Environment and Climate Change and the Minister responsible for the Parks Canada  
330 Agency are ultimately responsible for the preparation and completion of a national  
331 management plan for Dolphin and Union Caribou under SARA.

**332 Government of Nunavut**

333 The **Government of Nunavut** (GN) Department of Environment (DOE) is responsible for  
334 the protection, management and sustainable use of wildlife in Nunavut. The GN conducts  
335 scientific research and collects IQ relevant to species of management concern in Nunavut.  
336 The GN works with co-management partners to develop and implement territorial  
337 management plans and federal recovery documents for species at risk. The Minister has  
338 the final authority to accept decisions made by the Nunavut Wildlife Management Board.

**339 Nunavut Wildlife Management Board:**

340 The **Nunavut Wildlife Management Board** (NWMB) is the main instrument of wildlife  
341 management established under the NLCA under Article 5. The Board and its co-  
342 management partners work together to combine the knowledge and understanding of  
343 wildlife managers, users, and the public to make decisions concerning the management of  
344 wildlife in Nunavut. The NWMB makes decisions on Total Allowable Harvest (TAH) and  
345 non-quota limitations as per the NLCA under Article 5. In addition to the NWMB, the  
346 Nunavut Land Claims Agreement created other Boards to manage the land and resources in  
347 the Nunavut Settlement Area which include the Nunavut Planning Commission (NPC), the  
348 Nunavut Impact Review Board (NIRB), the Nunavut Water Board (NWB) and the Nunavut  
349 Surface Rights Tribunal (NSRT). The NWMB, NPC, NIRB and NWB, may act together as the  
350 Nunavut Marine Council when necessary to address issues of common concern relating to  
351 the marine areas of Nunavut.

**352 Kitikmeot Regional Wildlife Board**

353 The **Kitikmeot Regional Wildlife Board** (KRWB) is responsible for providing ongoing  
354 advice and support to co-management partners, and allocating annual TAH, once it is set, to  
355 the affected communities. They also fulfill other wildlife co-management obligations in  
356 accordance with the NLCA under Article 5. KRWB is also responsible for reviewing  
357 management plans.

**358 Nunavut Tunngavik Inc:**

359 **Nunavut Tunngavik Inc.** (NTI), although not a management authority, is responsible for  
360 ensuring that all processes adhere to the NLCA. The *Nunavut Wildlife Act* recognizes IQ in  
361 its legislation, which obligates Nunavut to make certain that Inuit voices are included. NTI

362 provides information and supports the implementation of the NLCA Article 5 to the wildlife  
363 co-management partners as required.

364 **Hunters & Trappers Organizations and Hunters & Trappers Committees:**

365 The **Hunters and Trappers Organizations** (HTOs) in Nunavut and the **Hunters and**  
366 **Trappers Committees** (HTCs) in the NWT, while not necessarily management authorities,  
367 are each responsible for ensuring harvest reporting by members, allocating TAH among  
368 members where appropriate, and conducting community-based monitoring and research  
369 with the support of the other co-management partners. The Nunavut HTOs can set by-laws  
370 for their members and the NWT HTCs can make by-laws that become regulations  
371 enforceable under the *NWT Wildlife Act*. The following HTOs and HTCs were included in  
372 the development of the Dolphin and Union Caribou management plan: Kugluktuk HTO,  
373 Ekaluktutiak HTO (Cambridge Bay), Omingmaktok HTO (Bay Chimo), Burnside HTO  
374 (Bathurst Inlet), Olohaktomiut HTC (Ulukhaktok), and Paulatuk HTC.

375 **Government of the Northwest Territories**

376 The **Government of the Northwest Territories** (GNWT), represented by the Minister of  
377 Environment and Natural Resources (ENR), has ultimate responsibility for the  
378 conservation and management of wildlife and wildlife habitat in the NWT, in accordance  
379 with land claims and self-government agreements, and having due regard for existing,  
380 pending, and future interests in land. It is the ultimate responsibility of the Minister of ENR  
381 to prepare and complete a management plan for Dolphin and Union Caribou under the  
382 *Species at Risk (NWT) Act*.

383 **Wildlife Management Advisory Council (NWT):**

384 The **Wildlife Management Advisory Council (NWT)** [WMAC (NWT)] is the main  
385 instrument of wildlife management in the Inuvialuit Settlement Region (Western Arctic  
386 Region) of the NWT. The WMAC (NWT) advises the federal and territorial governments on  
387 wildlife policy, management, regulation, and administration of wildlife, habitat and  
388 harvesting in the Inuvialuit Settlement Region (ISR) (IFA, sections 14). The  
389 recommendations of this co-management group provide the foundation for caribou  
390 management in the ISR. These recommendations are based on best available information  
391 including TK, local knowledge and science. The WMAC (NWT) works collaboratively with  
392 the Inuvialuit Game Council, HTCs, and other governments in research, monitoring and  
393 management of caribou and their habitat. The WMAC (NWT) consults regularly with  
394 Inuvialuit Game Council and HTCs, and these groups assist the WMAC (NWT) in carrying  
395 out its functions. The WMAC (NWT) recommends appropriate quotas for Inuvialuit wildlife  
396 harvesting, including TAH for caribou when appropriate. The WMAC (NWT) also provides  
397 comments during environmental screening and review processes regarding the monitoring  
398 and mitigation of impacts of development on Dolphin and Union Caribou and their habitat.

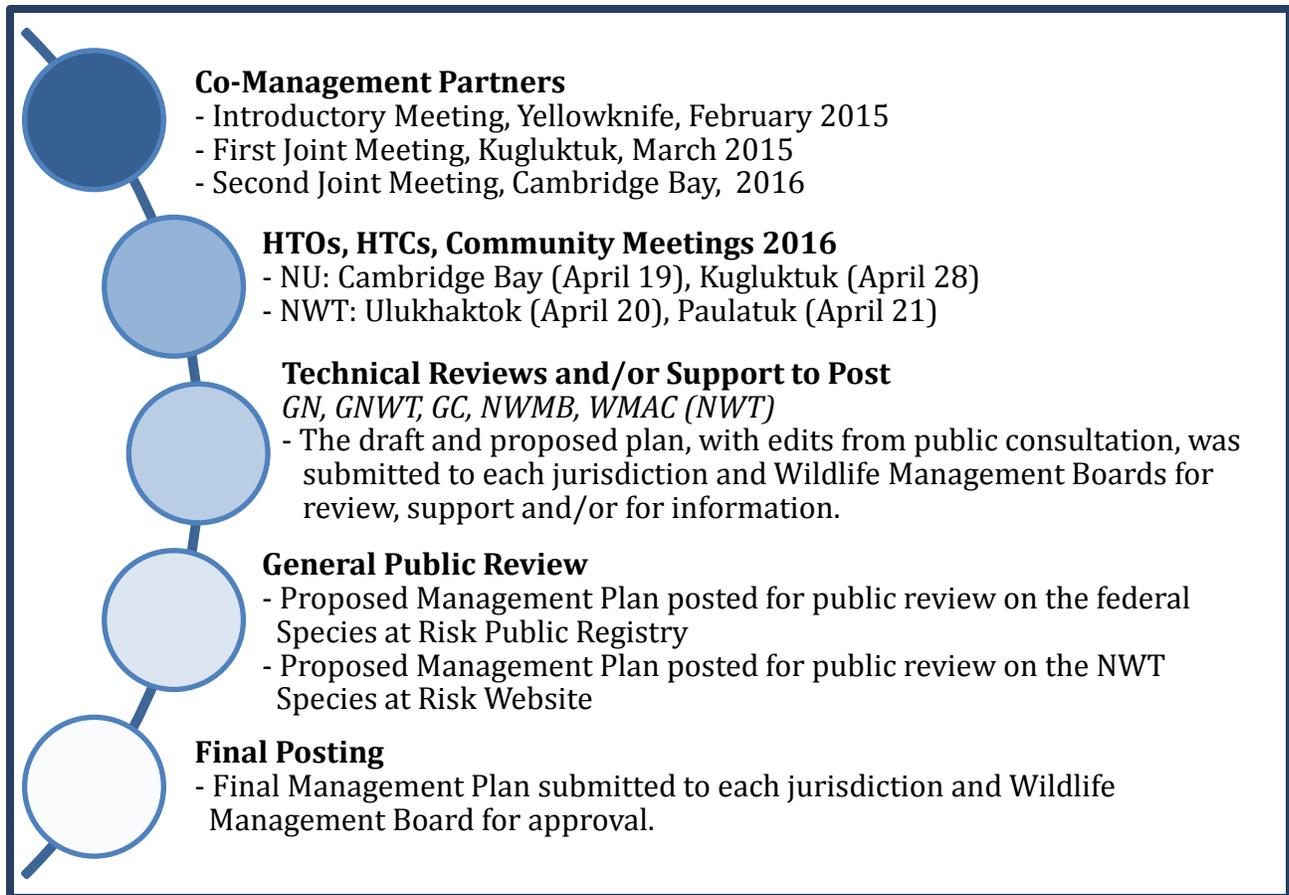
399 **Inuvialuit Game Council:**

400 Under the IFA, the **Inuvialuit Game Council** (IGC) represents the collective Inuvialuit  
401 interest in all matters pertaining to the management of wildlife and wildlife habitat in the  
402 ISR. This responsibility gives the IGC authority for matters related to harvesting rights,  
403 renewable resource management, and conservation.

### 404 ***2.3 Management Planning Process***

405 Due to the multiple jurisdictions and agencies involved in managing Dolphin and Union  
406 Caribou, management must be carried out as a team to be successful. The management plan  
407 was prepared jointly by the GNWT-ENR and GN-DOE, in collaboration with the GC  
408 Environment and Climate Change, the Parks Canada Agency and co-management partners  
409 mentioned in Section 2.2.

410 To facilitate the plan development, an introductory meeting outlining the management  
411 planning process took place in February 2015 with representatives of communities and co-  
412 management partners within the range of Dolphin and Union Caribou. Two joint meetings  
413 were held in Nunavut: in Kugluktuk (March 2015) and Cambridge Bay (January 2016) with  
414 representatives of KRWB, KIA, NTI, WMAC (NWT), IGC, HTOs from Cambridge Bay,  
415 Kugluktuk, and Bathurst Inlet, and HTC's from Paulatuk and Ulukhaktok. GN, GNWT and GC  
416 also attended the meetings. The meeting participants discussed the content and framework  
417 of the management plan, new information on Dolphin and Union Caribou, threats to the  
418 population, approaches to address threats, and options for harvest management. The joint  
419 meetings provided opportunities for harvesters and co-management partners from  
420 Nunavut and the NWT to discuss Dolphin and Union Caribou issues and to share their  
421 knowledge. IQ, TK and local knowledge were shared to help form the foundation of this  
422 management plan and inform the document throughout. Notes were produced after each  
423 meeting that summarized the input and guidance provided by co-management partners  
424 (First Joint Meeting 2015; Second Joint Meeting 2016). As each draft of the management  
425 plan was completed, it was provided to all co-management partners for their review and  
426 input. The planning process is summarized in Figure 1.



427

428 Figure 1. Management Planning Process for Dolphin and Union Caribou.

429 In addition, the GNWT and the WMAC (NWT) visited Ulukhaktok and Paulatuk in July 2014  
 430 to discuss listing the Dolphin and Union Caribou. They returned to the community of  
 431 Ulukhaktok in June 2015 to discuss the Dolphin and Union Caribou Management  
 432 Framework. Comments and feedback were considered and incorporated into the  
 433 management plan.

434 Community meetings were held in Cambridge Bay, Kugluktuk, Paulatuk and Ulukhaktok in  
 435 April 2016 to review the draft management plan. Each section of the plan was summarized  
 436 and explained with the goal of collecting feedback from HTO and HTC board members and  
 437 from community members. Notes were later produced that summarized the input and  
 438 guidance provided by each community (Ekaluktutiak HTO 2016; Kugluktuk HTO 2016;  
 439 Paulatuk HTC 2016; Olohaktomiut HTC 2016).

440 Input from all parties including the general public was solicited once more through the  
 441 posting of the proposed draft plan for comment on the federal Species at Risk Public  
 442 Registry and on the NWT species at risk website. GNWT also consulted on the draft  
 443 management plan with relevant Indigenous organizations including the IGC and NTI with  
 444 respect to potential infringement of established or asserted Indigenous or treaty rights.

445 Feedback received during engagement and consultation was considered when drafting the  
446 final plan. The final plan was then submitted to GN, GNWT, GC, WMAC (NWT), and NWMB  
447 for approval.

## 448 ***2.4 Inuit Qaujimaqatugangit, Traditional Knowledge and Local*** 449 ***Knowledge***

450 This management plan incorporates scientific knowledge and local knowledge, and is  
451 guided equally by IQ and TK principles.

452 The term local knowledge used in this document fits the definition of Local Ecological  
453 Knowledge defined by Charnley et al. (2007): “Local ecological knowledge is defined here  
454 as knowledge, practices, and beliefs regarding ecological relationships that are gained  
455 through extensive personal observation of and interaction with local ecosystems, and  
456 shared among local resource users”.

457 IQ is the system of values, knowledge, and beliefs gained by Inuit through generations of  
458 living in close contact with nature. For Inuit, IQ is an inseparable part of their culture and  
459 includes rules and views that affect modern resource use.

460 Inuvialuit prefer the term TK (Armitage and Kilburn 2015). TK is “a cumulative body of  
461 knowledge, know-how, practices and presentations maintained and developed by the  
462 peoples over a long period of time. This encompasses spiritual relationships, historical and  
463 present relationships with the natural environment, and the use of natural resources. It is  
464 generally expressed in oral form, and passed on from generation to generation by  
465 storytelling and practical teaching” (Smith 2006).

466 Recommendations for the management of Dolphin and Union Caribou will continue to be  
467 guided by the best available local knowledge, and IQ and TK information. Observations  
468 from elders and other knowledgeable community members, including local harvesters, are  
469 fully integrated into this management plan along with scientific research.

470 The practical application of IQ, TK, and local knowledge demonstrates the value of local  
471 consultations in order to document and preserve IQ and TK before it is lost. The  
472 communities of the western Kitikmeot region and the eastern ISR will continue to be  
473 engaged on an ongoing basis to ensure that IQ and TK as well as local knowledge are  
474 utilized in conjunction with scientific information in the management of the Dolphin and  
475 Union Caribou.

476

## 477 **3. HISTORICAL AND SOCIAL PERSPECTIVE**

478 For thousands of years, the northern Indigenous Peoples have subsisted off the land, using  
479 all available resources, including caribou. Caribou have formed the foundation for the Inuit  
480 and Inuvialuit lifestyle and culture.

481 For many western Arctic communities, the Dolphin and Union Caribou have traditionally  
482 provided an important source of food and raw material. In earlier times, caribou bones and  
483 antlers were shaped into tools, sinew was used for thread and hides were used to make  
484 winter parkas, summer tents, and sleeping skins. Dolphin and Union Caribou continue to  
485 provide a strong social and economic base for the Inuit and Inuvialuit who live in their  
486 range by providing subsistence food and economic opportunities for local guides.  
487 Relationships in the communities are established and enhanced by sharing and exchanging  
488 the harvest.

489 On a spiritual level, the Inuit and Inuvialuit people hold tremendous respect toward  
490 caribou. This carries with it certain obligations not to unduly harm or disrespect the  
491 animal. Prayer and leaving offerings before hunting are important aspects of this belief.  
492 Respecting rules about the use of meat and hides, including sharing of harvest and not  
493 wasting meat, are also considered essential to this approach.

### 494 ***3.1 Communities that Harvest Dolphin and Union Caribou***

495 The distribution of Dolphin and Union Caribou crosses two jurisdictions - Nunavut and  
496 NWT. They are harvested by Indigenous, resident<sup>1</sup>, and non-resident<sup>2</sup> harvesters in both  
497 territories. Dolphin and Union Caribou are harvested by the communities of Kugluktuk,  
498 Umingmaktok, and Bathurst Inlet in the winter/spring as well as Paulatuk during the  
499 winter. They are harvested in Ulukhaktok in the summer/fall, and Cambridge Bay in all  
500 seasons. During the spring season, some Cambridge Bay hunters cross to the mainland and  
501 can access Dolphin and Union Caribou as they migrate back to Victoria Island. This  
502 population may also be harvested by people from other communities, other Canadian  
503 provinces and territories, as well as non-Canadians (with restrictions).

### 504 ***3.2 Use of the Population and History of Harvest Management***

505 Opportunities to harvest caribou are highly dependent on caribou movement and  
506 distribution of the population in relation to human settlements. At the beginning of the last  
507 century, the Dolphin and Union Caribou range was closely tied with the Dolphin and Union

---

<sup>1</sup> NWT Resident: A Canadian citizen or landed immigrant who has been living in the NWT for 12 continuous months.

Nunavut Resident: A Canadian citizen or landed immigrant who has been living in Nunavut for at least three months.

<sup>2</sup> Non-resident (NWT): A Canadian citizen or landed immigrant who lives outside the NWT or has not resided in the NWT for 12 months.

Non-Resident (Nunavut): A Canadian citizen or landed immigrant who lives outside Nunavut or has not resided in Nunavut for at least three months.

508 Strait, where caribou migrated from Victoria Island to the mainland. There, they were  
509 available for harvesting from outpost camps at Read Island and Bernard Harbour (First  
510 Joint Meeting 2015). During the 1920s, the caribou population began dwindling and at the  
511 same time, their migration to the mainland ceased. An eastward shift of caribou winter  
512 range made it possible for the community of Cambridge Bay, on the eastern side of Victoria  
513 Island, to rely on this population, as highlighted by IQ holders (First Joint Meeting 2015).  
514 Dolphin and Union Caribou were not available to the communities located on the Canadian  
515 mainland until the 1980s. At that point, they resumed their migration, this time through the  
516 Coronation Gulf, becoming accessible to hunters from Paulatuk, Kugluktuk, Umingmaktok  
517 and Bathurst Inlet.

518 There are challenges to evaluating the historical and present harvest pressure on this  
519 population. Past harvest reporting through harvest studies was voluntary in both  
520 jurisdictions and there are several sources of error that are common between the Inuvialuit  
521 and Nunavut harvest studies (Inuvialuit Harvest Study 2003; NWMB 2004). Some  
522 harvesters declined to be interviewed; this can be an issue, particularly if those hunters are  
523 very active. Some harvesters may have under-reported in order to avoid the survey or  
524 because of a misunderstanding of use of the data. Also, some harvesters may have been  
525 overlooked and not included in the harvest interviews. There is also the potential issue of  
526 inconsistent reporting and inability of harvesters to recall their harvest accurately. Further  
527 details on the errors and how they could have impacted results are found in the reports for  
528 each harvest study (Inuvialuit Harvest Study 2003; NWMB 2004). Current reporting of  
529 harvest is either voluntary or not collected; therefore harvest numbers are often unreliable  
530 and incomplete. This uncertainty was one of the reasons that the Committee on the Status  
531 of Endangered Wildlife in Canada (COSEWIC) assessed Dolphin and Union Caribou as a  
532 species of special concern in 2004 (COSEWIC 2004), since a harvest of 2,000 to 3,000  
533 caribou was estimated at this time based on the Kitikmeot Harvest study. This estimate did  
534 not necessarily account for the likely under-reporting of harvest (Gunn and Nishi 1998;  
535 Nishi and Gunn 2004).

536 The Inuvialuit Harvest study ran from 1988 to 1997. During that time the estimated  
537 harvest by the community of Ulukhaktok (Holman - calculated using reported harvest and  
538 response rates) was 189 to 681 caribou per year, with a mean of 441 (Inuvialuit Harvest  
539 Study 2003). However, the type of caribou was not specified. Based on the seasonal  
540 migrations, if it is assumed Dolphin and Union Caribou are only on Victoria Island between  
541 June and November, the maximum estimated annual Dolphin and Union Caribou harvest  
542 was 178 to 509 per year, with a mean of 329. In 1994/95, an Olokhatomiut HTC by-law was  
543 put in place for Peary caribou north of Minto Inlet (I/BC/03 area). The Inuvialuit Harvest  
544 Study data reflects this change in harvest with the overall caribou harvest declining to  
545 approximately 30% of levels at the beginning of the study (1988) but the proportion of  
546 caribou harvest in the winter (assuming Peary caribou) declining from > 45% in 1988 to  
547 less than 1% in 1997. Another harvest data collection took place in Ulukhaktok from 2001  
548 to 2009. According to that study, reported harvest (not corrected for response rate) ranged  
549 from 32 to 360 caribou harvested per year in I/BC/04 (area south of Minto inlet and  
550 around Prince Albert Sound) (ENR 2015a). Based on Inuvialuit Harvest Study data and

551 community comments, there is likely a small harvest of caribou north-east of Paulatuk  
552 along the coast.

553 The Nunavut Harvest Study - from 1996 to 2001 - revealed that Kugluktuk harvested on  
554 average 1,575 caribou annually, Cambridge Bay: 811, Bathurst Inlet: 93, and Umingmaktok:  
555 176 caribou (NWMB 2004). In other words, this study shows a total annual subsistence  
556 harvest of 2,655 caribou from these four communities. However, the accuracy of the  
557 Nunavut harvest study has been questioned since hunters did not specify the type of  
558 caribou harvested or the population/herd from which they were harvested. Therefore, the  
559 proportion of Dolphin and Union Caribou taken annually in each of the communities still  
560 remains unknown. It is well known that the proportion of the harvest made up by each  
561 population/herd is very inconsistent and varies widely from year to year, based on  
562 distribution and the accessibility of each population/herd to the communities (Second Joint  
563 Meeting 2016). The preliminary results from the harvest of Dolphin and Union Caribou  
564 from 2010 to 2014, revealed a harvest of only 10 to 80 caribou. These were voluntarily  
565 reported as harvested on an annual basis around Kugluktuk (GN-DOE, in prep).

566 In both Nunavut and NWT, while subject to conservation principles, there are currently no  
567 harvest limitations on the Dolphin and Union Caribou for beneficiaries<sup>3</sup>; they can harvest  
568 this caribou to the full extent of their economic, social and cultural needs. Community  
569 members from both Ulukhaktok and Kugluktuk explained that they increase their harvest  
570 of Dolphin and Union Caribou in response to a decrease in access or availability of other  
571 populations/herds (Second Joint Meeting 2016). Some hunters agree that the cost of gas  
572 and food is so high that it limits or prevents them from harvesting. Fewer hunters go out  
573 now and fewer caribou are harvested as store bought food is available and the need to feed  
574 dog teams has diminished (First Joint Meeting 2015). Thus, there is a pressing need to have  
575 a stronger effort to monitor and manage harvest so future actions can address the current  
576 harvest pressure.

## 577 **4. SPECIES INFORMATION**

### 578 ***4.1 Species Status and Assessment***

#### 579 **COSEWIC Species Assessment Information (COSEWIC 2004)**

---

<sup>3</sup> A Beneficiary is an Aboriginal person who is on an enrollment list of a specified comprehensive land claim agreement and is entitled to certain rights under that agreement.

**Date of Assessment:** May 2004

**Common Name (population):** Barren-ground caribou (Dolphin and Union population)

**Scientific Name:** *Rangifer tarandus groenlandicus*

**COSEWIC Status:** Special Concern

**Reason for Designation:** This population of caribou is endemic to Canada. Once thought to be extinct, numbers have recovered to perhaps a quarter of the population historic size. They have not been censused since 1997 and are subject to a high rate of harvest, whose sustainability is questioned by some. They migrate between the mainland and Victoria Island and climate warming or increased shipping may make the ice crossing more dangerous. The population, however, increased substantially over the last three generations and was estimated at about 28000 in 1997.

**Canadian Occurrence:** Northwest Territories, Nunavut

**COSEWIC 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, *Rangifer tarandus pearyi*, was assessed separately from the Dolphin and Union Caribou, *Rangifer tarandus groenlandicus*. The Dolphin and Union Caribou is comprised of a portion of the former "Low Arctic population", and it was designated Special Concern in May 2004.

580

581 **Assessment of Dolphin and Union Caribou in the NWT by the Species at Risk**  
582 **Committee (SARC 2013)**

The Northwest Territories Species at Risk Committee met in Yellowknife, Northwest Territories on December 11, 2013 and assessed the biological status of Dolphin and Union Caribou in the Northwest Territories. The assessment was based on this approved status report. The assessment process and objective biological criteria used by the Species at Risk Committee are available at [www.nwtspeciesatrisk.ca](http://www.nwtspeciesatrisk.ca).

**Assessment: Special Concern in the Northwest Territories**

*The species is particularly sensitive to human activities or natural events but is not Endangered or Threatened.*

**Reasons for the assessment: Dolphin and Union Caribou fits criteria (a) and (b) for**

**Special Concern.**

(a) – *The species has declined to a level at which its survival could be affected by population characteristics, genetic factors or environmental factors but the decline is not sufficient to qualify the species as Threatened.*

(b) – *The species may become Threatened if negative factors are neither reversed nor managed effectively.*

**Main Factors:**

- Although there is too little information to assess long-term population trends of Dolphin and Union Caribou, there is evidence that the population has declined between 1997 and 2007.
- There is no possibility of rescue from neighbouring populations. Dolphin and Union Caribou are considered to be discrete from Peary caribou and barren-ground caribou, based on their morphology, genetics and behaviour (i.e., the distinct rutting area as well the herd's seasonal migrations across the sea ice of the Dolphin and Union Strait).
- Dolphin and Union Caribou are vulnerable to major environmental events such as changes in the timing of sea ice formation, changes to the thickness of sea ice, and icing and crusting events on their fall and winter range.

583

584 **NatureServe Ranks:** NatureServe ranks Dolphin and Union Caribou as unranked at the  
585 global level (TNR<sup>4</sup>) and imperiled-vulnerable at the national level (N2N3; , NatureServe  
586 2015). Dolphin and Union Caribou are ranked as imperiled-vulnerable (S2S3) in the NWT  
587 and as unranked (SNR) in Nunavut.

588 **Legal listing:** Dolphin and Union Caribou is listed as Special Concern (2011) under  
589 Canada's SARA and is listed as Special Concern (2015) under the territorial *Species at Risk*  
590 *(NWT) Act*.

591 In Nunavut, Dolphin and Union Caribou are not assessed or listed under territorial  
592 endangered species legislation. The *Nunavut Wildlife Act* has provisions for species at risk  
593 but regulations are not enacted.

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<sup>4</sup> Types of ranks: T = subspecies. Definitions: NR = unranked.

594 Table 1. Summary of status designations.

Jurisdiction	NatureServe Rank <sup>2</sup>	Status Assessment	Legal Listing
Canada	N2N3	Special Concern (COSEWIC 2004)	Special Concern (SARA 2011)
Nunavut	SNR	N/A	N/A
NWT	S2S3	Special Concern (SARC 2013)	Special Concern ( <i>NWT Species at Risk (NWT) Act 2015</i> )

595 <sup>2</sup> Types of ranks: N = national conservation status rank; S = sub-national (provincial or territorial) ranks.  
 596 Definitions: 2 = imperiled; 3 = vulnerable; NR = unranked.

597

598 **4.2 Species Names**599 **Common name used in this report:** Dolphin and Union Caribou

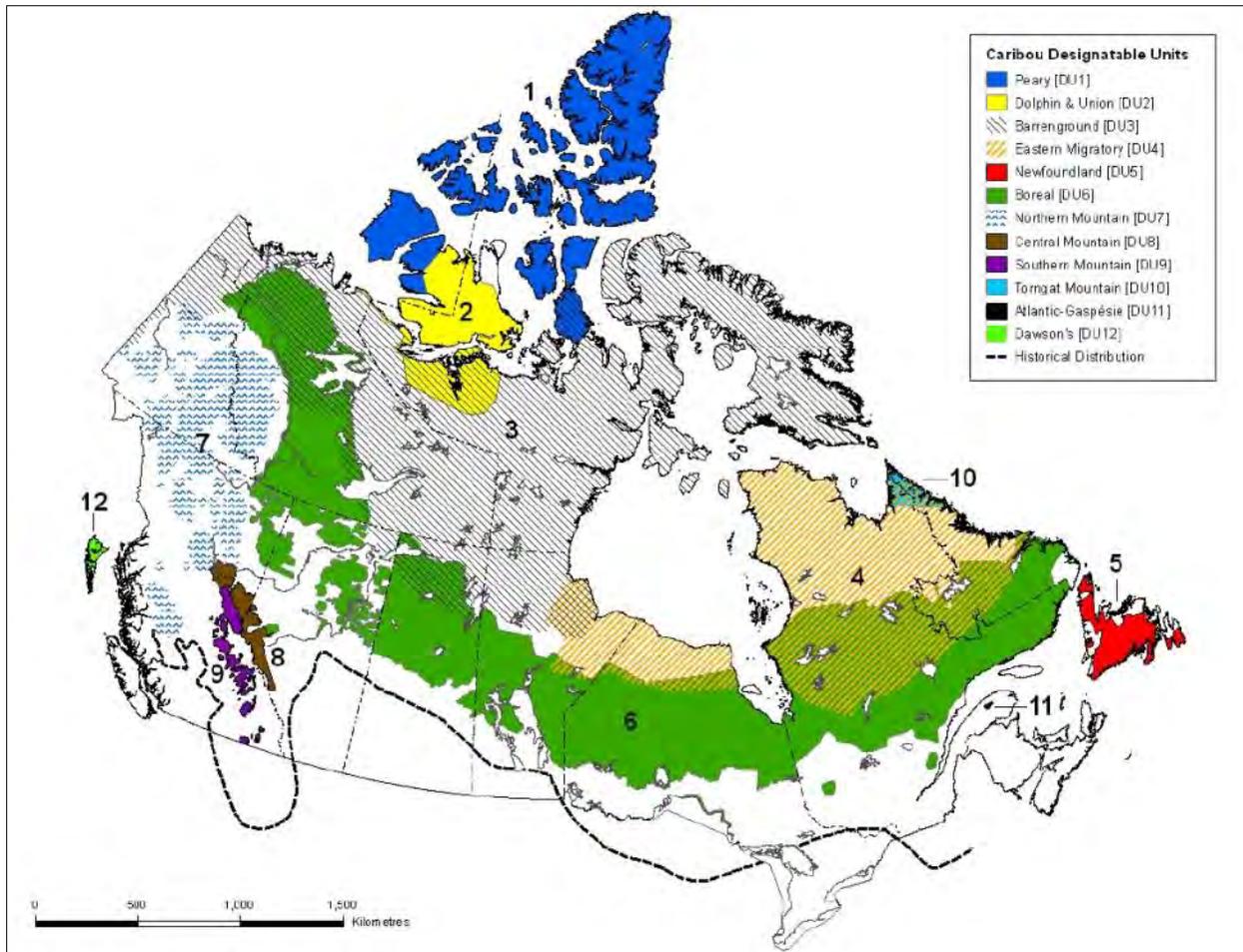
600 **Other common names:** Island caribou (NWT and Nunavut; English), Arctic-island caribou  
 601 (NWT and Nunavut; English), Mainland caribou (Ulukhaktok, NWT; English), Barren-  
 602 ground caribou (Dolphin and Union population) (English), caribou du troupeau Dolphin-et-  
 603 Union (French), Tuktuk (Inuktituk), Tuktu (Inuinnaqtun), Tuktu/tuktut (Siglitun), Tuttu  
 604 (Ummarmiutun)

605 **Scientific name:** In 2004, COSEWIC designated Barren-ground Caribou (*Rangifer tarandus*  
 606 *groenlandicus*), Dolphin and Union population, as special concern. The species was added  
 607 to the List of Wildlife Species at Risk (Schedule 1) of SARA. In 2011, COSEWIC created  
 608 'Designatable Units' (DU) for caribou (*Rangifer tarandus*) in Canada using a number of  
 609 variables to classify the different herds or groups of herds (Figure 2, COSEWIC,  
 610 2011). These DU descriptions provided a clear and consistent scheme for identifying DUs  
 611 due to the complexity of *Rangifer tarandus* in Canada. The Dolphin and Union population of  
 612 Barren-ground Caribou was determined to belong to *Rangifer tarandus groenlandicus*  
 613 (DU2), and was simply referred to as Dolphin Union Caribou. Although this naming  
 614 convention differs slightly from the COSEWIC assessment (2004) and Schedule 1 of SARA,  
 615 the common name used henceforth in the management plan will follow the suggested 2011  
 616 DU name: Dolphin and Union Caribou.

617

618 The GNWT's Species at Risk Committee (SARC) used *Rangifer tarandus groenlandicus x*  
 619 *pearyi* in their 2013 Status Report (SARC, 2013), and the GN also uses this naming  
 620 convention to identify Dolphin and Union Caribou. Despite what is suggested by the  
 621 Dolphin and Union Caribou's subspecies designation, genetic evidence reveals that it is

622 distinct from the Peary caribou and from the migratory barren-ground caribou that is also  
 623 of subspecies *groenlandicus* (McFarlane et al 2016).  
 624  
 625



626  
 627 Figure 2. Caribou Range Map in Canada, broken down into Designatable Units (COSEWIC,  
 628 2011).

629 **Occurrence:** Dolphin and Union Caribou occur in Canada and are restricted to Victoria  
 630 Island and the mainland opposite Victoria Island. They cross two jurisdictions: Nunavut  
 631 and NWT.

632 **4.3 Species Description and Biology**

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Figure 3. Dolphin and Union Caribou near High Lake, west of Bathurst Inlet, April 2008. Photo by K. Poole, used with permission.

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Dolphin and Union Caribou are morphologically and behaviourally different from other barren-ground caribou (*Rangifer tarandus groenlandicus*) populations and from Peary caribou (*Rangifer tarandus pearyi*) (COSEWIC 2011). They are best identified using a combination of characteristics (Kugluktuk HTO 2016). They are mostly white in winter, and are grey with white underparts in summer (Figure 3). They have grey down the front of their legs, unlike the white legs of Peary caribou, and the shape of their muzzle is different from barren-ground caribou. They are also larger than Peary caribou, but smaller than the darker brown barren-ground caribou. The antler velvet of the Dolphin and Union Caribou is most commonly pale grey, similar to Peary caribou; this is a striking distinguishing characteristic compared to the brown velvet of barren-ground or boreal woodland (*R.t. caribou*) caribou. Genetic analysis confirms that Dolphin and Union Caribou are genetically distinct from Peary and barren-ground caribou. Their physical similarity to Peary caribou suggests similar evolutionary pressures having evolved in a similar environment, but they share haplotypes with the neighbouring barren-ground caribou herds which suggests a certain degree of inter-breeding (Zittlau 2004; Eger et al. 2009; McFarlane et al. 2009; McFarlane et al. 2016).

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One particular behaviour that distinguishes Dolphin and Union Caribou from the mainland barren-ground caribou populations is their seasonal migrations. Twice a year, thousands of Dolphin and Union Caribou cross the sea ice in a synchronous and coordinated way to reach their summer and winter grounds. Below a certain population threshold, migration may cease; in fact, this took place in the early 1920s when population numbers were very low. At the time, Dolphin and Union Caribou remained on Victoria Island year-round.

#### 658 **4.3.1 Life cycle and reproduction**

659 Dolphin and Union Caribou population dynamics are not well-documented although the  
660 population shares some life-history strategies similar to barren-ground caribou. The rut  
661 starts in mid-October, concurrently with their fall staging and migration. It is typical for a  
662 Dolphin and Union Caribou bull to mate with more than one cow.

663 Accessibility of forage can impact a caribou cow's body condition, which then determines  
664 the age of first pregnancy and the annual likelihood that a cow will conceive (Thomas 1982;  
665 Gerhart et al. 1997). Under good conditions such as abundant forage, low stress and low  
666 parasitism, a female caribou can have a single calf every year (Heard 1990; Thorpe et al.  
667 2001). Pregnancy rates are annually variable (Nishi 2000; Hughes 2006; CARMA 2012;  
668 SARC 2013).

669 Dolphin and Union Caribou are relatively long-lived with a reproductive lifespan of about  
670 12 years (SARC 2013). Hughes (2006) found the age of harvested Dolphin and Union  
671 Caribou cows ranged from 1.8 to 13.8 years with a mean age of 6.5 years. One caribou with  
672 a marked ear was observed approximately 20 years after the marking program had  
673 stopped (First Joint Meeting 2015).

#### 674 **4.3.2 Natural mortality and survival**

675 There are challenges in measuring natural mortality, and details on survival rates of  
676 Dolphin and Union Caribou are limited. Cow survival, measured using a small number of  
677 collared cows between 1999 and 2006, was relatively low (76%; Poole et al. 2010). Causes  
678 of mortality include drownings, predation, harvest, and malnutrition associated with both  
679 icing events as well as parasites and disease (Gunn and Fournier 2000; Miller 2003;  
680 Patterson unpubl. data 2002; Poole et al. 2010). These sources of mortality are discussed in  
681 detail in Section 5.

#### 682 **4.3.3 Diet**

683 Caribou eat a variety of plants, depending on the time of year and plant availability. They  
684 are known to eat lichens, willows, grasses, dwarf birch, mountain avens, Arctic sorrel,  
685 mushrooms, moss campion and berries (Thorpe et al. 2001; Dumond et al. 2007;  
686 Olohaktomiut Community Conservation Plan 2008; Badringa 2010; Ulukhaktok TK  
687 interviews 2011-2013).

688 In the 1990s, rumen contents of Dolphin and Union Caribou were investigated in early and  
689 late winter on Victoria Island. In November, sedges, dwarf shrubs (mountain avens and  
690 willow) and forbs dominated their diet, while lichen and moss formed only a small fraction.  
691 In April, dwarf shrubs continued to dominate their diet. This is unusual, as winter caribou  
692 diets are usually dominated by lichen such as reindeer lichen, snow lichen and worm lichen  
693 (Staaland et al. 1997). However, the low lichen proportion in the Dolphin and Union  
694 Caribou diet is similar to that of Peary caribou, where lichen constitutes a small part of the  
695 available biomass and their diet (Miller and Gunn 2003). After the snow melts in mid-July,  
696 Dolphin and Union Caribou feeding generally focuses on moist sites and their diets include

697 grasses and green willows (Dumond et al. 2007). Although their summer diet has not been  
 698 investigated through science, Dolphin and Union Caribou have been described as having a  
 699 very green stomach in the summer (Ulukhaktok TK interviews 2011-2013).

#### 700 **4.3.4 Habitat needs**

701 Due to migrations between Victoria Island and the mainland (Table 2), a key habitat  
 702 requirement for Dolphin and Union Caribou is the seasonal connectivity of the sea ice.

703 Table 2. Approximate timing of spring and fall migrations for Dolphin and Union Caribou

<b>Time of year</b>	<b>Migration on land or sea ice</b>	<b>Direction of the migration</b>
Late March - April	Land	Move northward to mainland coast.
April	Sea ice	Migrate from mainland coast to Victoria Island and also to ancillary islands.
September - October	Land	Migrate to southern part of Victoria Island and gather in staging areas near southern coast.
End of October - December	Sea ice	Cross the sea ice to their winter range on the mainland.

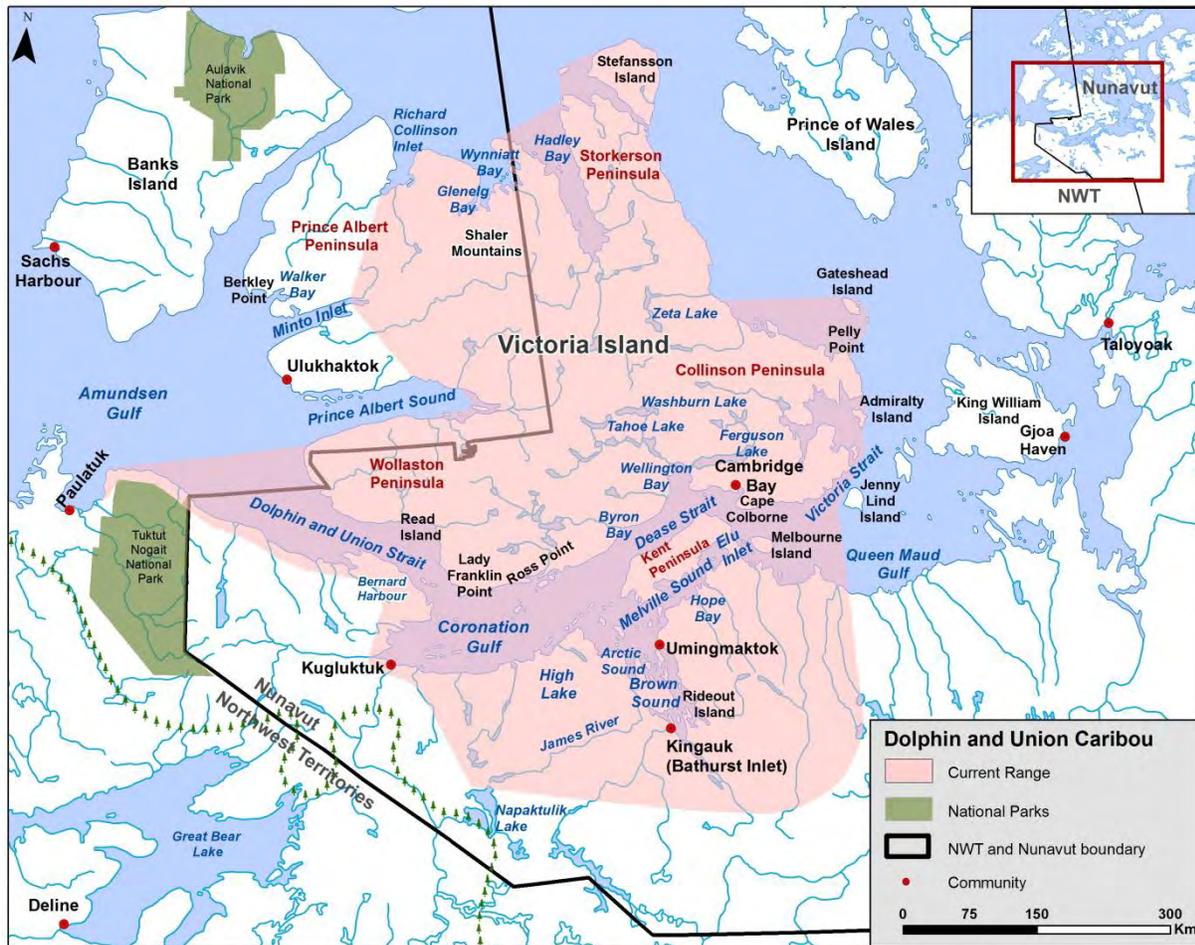
704

#### 705 Spring migration

706 In late March and April, Dolphin and Union Caribou begin moving northward to the coast  
 707 for their migration to Victoria Island (Figure 4). Some Indigenous Peoples have observed  
 708 that prior to migration, Melbourne Island is an important area for staging (Gunn et al.  
 709 1997). During the migration, the Inuit indicate that Dolphin and Union Caribou leave  
 710 Brown Sound area in April, moving from Arctic Sound and Rideout Island toward Elu Inlet  
 711 and then across to Cambridge Bay. They also observe caribou crossing the Coronation Gulf,  
 712 via the Kent Peninsula and arriving on Victoria Island, either north of Bathurst Inlet or  
 713 further east at Cambridge Bay (Archie Komak, Ikaluktuuttiak in Thorpe et al. 2001). Poole  
 714 et al. (2010) found a mean ice crossing distance northwards for collared cows of 40 km  
 715 ( $\pm 7.2$  km).

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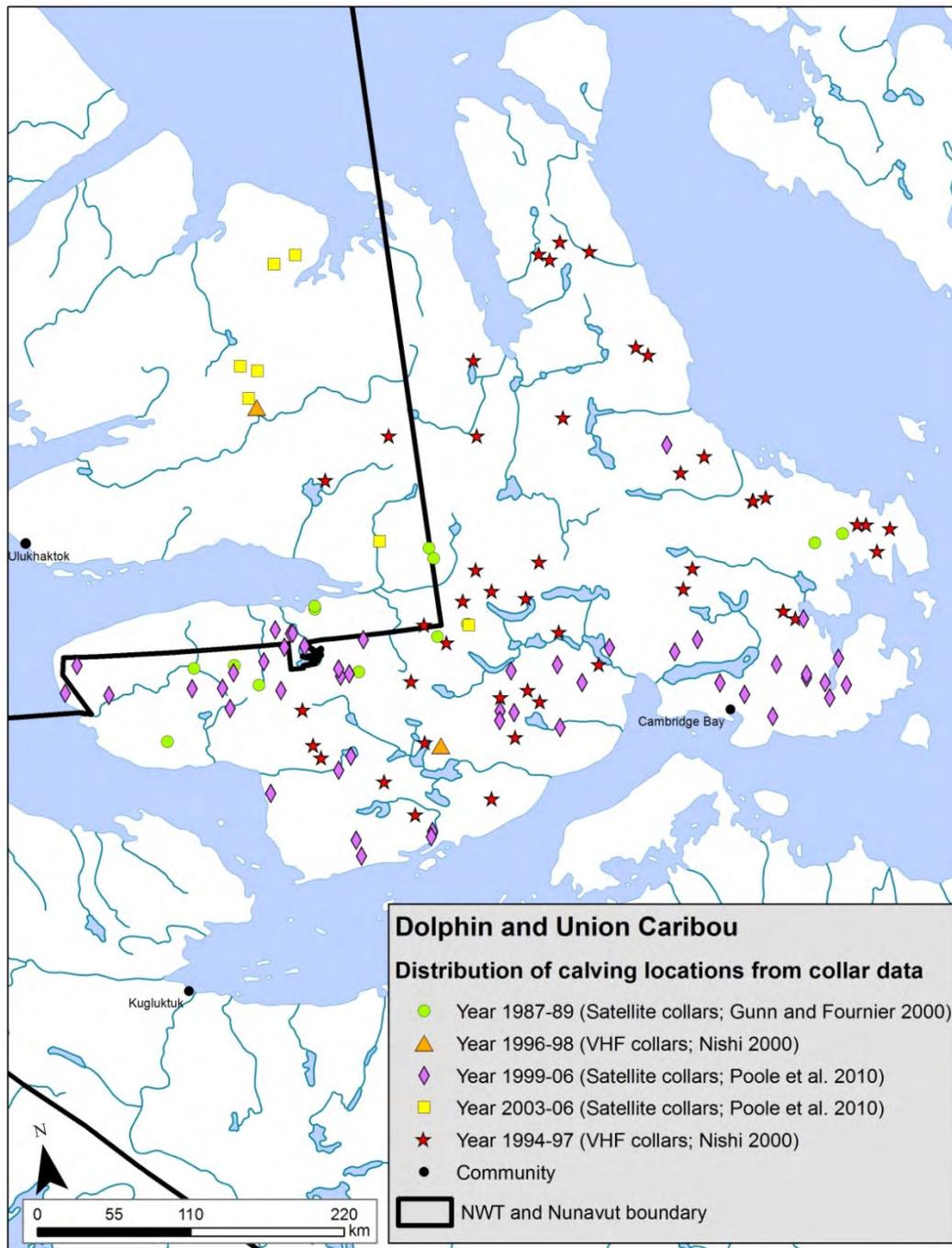
718  
 719 Figure 4. Notable place names and the current range of Dolphin and Union Caribou (NWT  
 720 Environment and Natural Resources, range data developed for Species at Risk program  
 721 2016).

722 Summer

723 Although Dolphin and Union Caribou usually spend their summers on Victoria Island, they  
 724 have also been found on the ancillary islands: Read Island, Gateshead Island, Jenny Lind  
 725 Island and Admiralty Island. Their summer range is known to extend to the northern part  
 726 of Victoria Island, in the Wynniatt Bay area, the Shaler Mountains and the northern extent  
 727 of Storkerson Peninsula with rare sightings on Stefansson Island (Figure 4).

728 During the summer, Dolphin and Union Caribou adopt an individualistic calving strategy in  
 729 which they give birth at locations dispersed across the island. They might calve alone or in  
 730 small groups, but they do not form a large aggregation or use a distinct calving ground that  
 731 can be delineated with confidence (Figure 5). Typically for other caribou such as the  
 732 barren-ground caribou, large flat areas are chosen for calving, likely to facilitate effective  
 733 detection of predators (Thorpe et al. 2001). Although barren-ground caribou females come  
 734 back to the same site to give birth, this calving site fidelity has not been scientifically

735 demonstrated for Dolphin and Union Caribou. The condition of the tundra may also impact  
 736 where caribou cows choose to calve (Thorpe et al. 2001).  
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738  
 739 Figure 5. Distribution of calving locations from collared caribou. Data from 1987-89  
 740 (green dots; Gunn and Fournier 2000), 1994-97 (orange triangles; Nishi 2000),  
 741 1994-97 (red stars; Nishi 2000), 1999-2006 (purple diamonds; Poole et al. 2010)  
 742 and 2003-06 (yellow squares; Poole et al. 2010). Figure modified from SARC 2013,  
 743 by B. Fournier, GNWT-ENR 2016.

744 Food supply for the newborn calf and its mother is highly important, as newborns and  
745 mothers have high nutritional needs. During the summer, calves must grow quickly and  
746 store fat for the winter; therefore access to high quality vegetation is important (Thorpe et  
747 al. 2002). Caribou will often seek out areas where the snow has melted and fresh green  
748 growth is available. After their mother's milk, cottongrass may be the first vegetation  
749 consumed by calves (Thorpe et al. 2001).

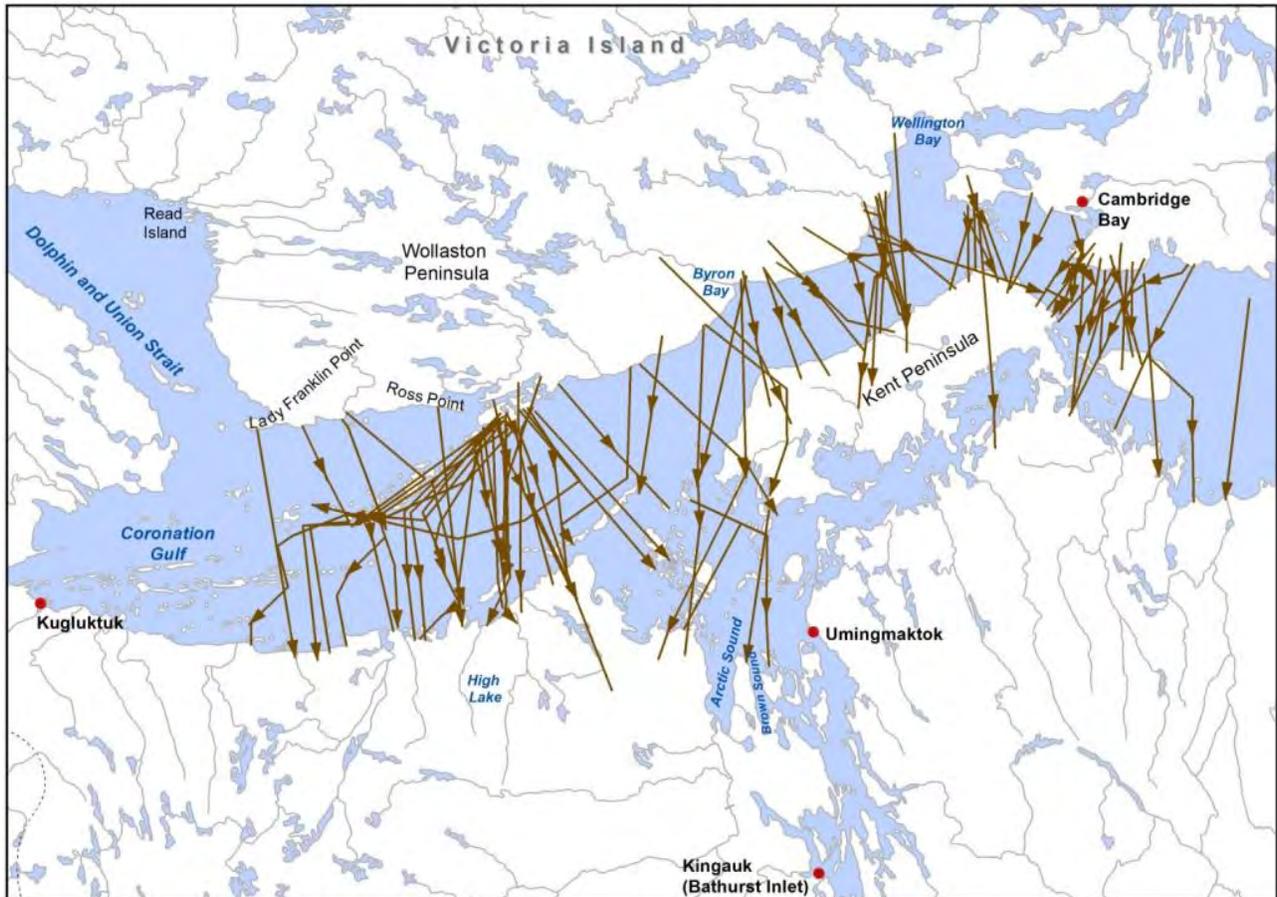
750 During the summer, caribou typically seek cooler and damp areas where high winds  
751 provide relief from insects and the summer heat. They frequently find wet, marshy areas  
752 and may sometimes stand in water, or swim to escape the summer heat and insects. They  
753 also seek out shorelines as these areas provide protection from wolves at night and  
754 opportunities for grazing (Thorpe et al. 2001).

#### 755 Fall migration

756 Between September and October, Dolphin and Union Caribou migrate to the southern part  
757 of Victoria Island to cross the sea ice to their winter range on the mainland (Figure 6). As  
758 they wait for sea ice to form, they gather in staging areas to feed and rest before making  
759 their migration. It is believed Dolphin and Union Caribou use their staging time for  
760 intensive feeding before their fall migration (Gunn et al. 1997).

761 Dolphin and Union Caribou typically cross the sea ice to the mainland between the end of  
762 October and early December, and the majority will cross in a short window of time. Caribou  
763 are seen crossing from Cape Colborne to Kent Peninsula within a few days (Nishi and Gunn  
764 2004). Poole et al. (2010) observed caribou to take 4.0 days ( $\pm 0.53$  d) to cross from  
765 Victoria Island to the mainland, while another observed this crossing to occur in one day  
766 (L. Leclerc Regional Biologist, GN, DOE, pers. comm. 2016). Poole et al. (2010) also found a  
767 mean ice crossing distance southwards for collared cows of 48.1 km ( $\pm 7.8$  km).

768



769 Figure 6. Dolphin and Union Caribou fall migration between Victoria Island and the  
 770 mainland (modified from Poole et al. (2010), by B. Fournier, GNWT-ENR 2016).

#### 771 Winter

772 Historically, Victoria Island was used as a wintering area for Dolphin and Union Caribou  
 773 when caribou numbers were low and the sea ice crossing had temporarily ceased (see  
 774 Section 4.4). Since the migration has resumed, the mainland has now become their  
 775 wintering ground, where it typically offers rich winter feeding opportunities (Thorpe et al.  
 776 2001). Snow cover influences habitat selection as it is linked to the energy costs associated  
 777 with digging through snow to access forage, as well as travelling within and among habitat  
 778 patches. They typically avoid deep or “sleet-covered” snow as it is more difficult to access  
 779 food (Thorpe et al. 2001). Therefore, one key habitat requirement is terrain and vegetation  
 780 that offers choices to caribou as they adjust their foraging to changing snow conditions  
 781 (Larter and Nagy 2001; SARC 2013).

#### 782 **4.4 Population and Distribution**

783 Observations of the population and distribution of Dolphin and Union Caribou through TK,  
 784 IQ, local knowledge, and from science observations up to 1990, are described in Table 3. As

785 seen in Table 3, limited scientific information is available for Dolphin and Union Caribou,  
786 with the majority of information provided through TK, IQ, and communities.

787 Table 3. Summary of observations on the population and distribution of Dolphin and Union  
788 Caribou, from IQ, TK, local knowledge, and science up to 1990.

<b>Timeline</b>	<b>Population</b>	<b>Distribution</b>
Beginning of 20 <sup>th</sup> century	<ul style="list-style-type: none"> <li>- Little scientific information on population</li> <li>- Information derived from explorers' log books, records from trading posts, observations from geologists during exploration trips (Manning 1960)</li> <li>- Population thought to be abundant (100,000) and small portion of population remained on Victoria Island throughout the year while others migrated to mainland (Manning 1960)</li> </ul>	<ul style="list-style-type: none"> <li>- Known for seasonal migration across the Dolphin and Union Strait (First Joint Meeting 2015)</li> <li>- Humans harvested caribou along this Strait for centuries (Manning 1960; Savelle and Dyke 2002; Brink 2005)</li> <li>- Caribou stopped sea ice crossing to mainland, wintered on Victoria Island in 1920s (Gunn 2008)</li> <li>- Caribou were not seen around Read Island and Byron Bay in 1950s (First Joint Meeting 2015)</li> </ul>
First half of 20 <sup>th</sup> century	<ul style="list-style-type: none"> <li>- Population declined (Gunn 1990)</li> <li>- Caribou stopped migrating between mainland and Victoria Island (Nishi and Gunn 2004)</li> <li>- Almost no caribou sightings in 1900s (Gunn 1990)</li> <li>- 1920s caribou disappeared (Gunn 1990)</li> </ul>	<ul style="list-style-type: none"> <li>- 1960s caribou began expanding their range to Cambridge Bay (First Joint Meeting 2015).</li> <li>- Cambridge Bay hunters travelled up to 100 miles north/west on Victoria Island, to hunt Dolphin and Union Caribou or to hunt Peary Caribou on the northern part of the island (First Joint Meeting 2015; Olohaktomiut HTC 2016).</li> </ul>
1970s – early 1980s	<ul style="list-style-type: none"> <li>- Caribou sightings increased, particularly on southern/central Victoria Island (Gunn 1990)</li> </ul>	<ul style="list-style-type: none"> <li>- 1970s – 1997 saw a winter range expansion extending to southern Victoria Island (Figure 8)</li> <li>- Winter migration across the sea ice to the mainland in 1980s (Nishi 2000)</li> </ul>
1990s	<ul style="list-style-type: none"> <li>- Population decreasing around Ulukhaktok (Ulukhaktok TK Interviews, 2011-2013)</li> </ul>	<ul style="list-style-type: none"> <li>- Caribou observed to winter on mainland coast and southern coast of Victoria Island (south of Cambridge Bay) in early 1990s (Figure 8)</li> </ul>
1960s – 1990s	<ul style="list-style-type: none"> <li>- Cambridge Bay local knowledge (Tomaselli et al. 2016a): population increasing around Cambridge Bay</li> </ul>	<ul style="list-style-type: none"> <li>- Early and mid-1990s - Hunter observations from outpost camps suggest the annual fall migration</li> </ul>

Timeline	Population	Distribution
		was consistent and extensive (Nishi and Gunn 2004)
1990s – 2005	- Cambridge Bay local knowledge (Tomaselli et al. 2016a): pre-declining period with high caribou numbers observed around Cambridge Bay.	-Caribou observed to winter on mainland (Figure 8) -Winter range extending further south than in the past (TK and community knowledge sources cited in SARC 2013)
Mid-2005 – end of 2014	Cambridge Bay local knowledge (Tomaselli et al. 2016a): - Population declined but more evident since 2010 - Observed 80% less caribou in 2014 compared to 1990s - Decrease in calves and yearlings - Poorer body condition - Increased observations of abnormalities/diseases in caribou	
2011 – 2015	- Decrease in numbers around Cambridge Bay (First Joint Meeting 2015)	

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790 **Population:**

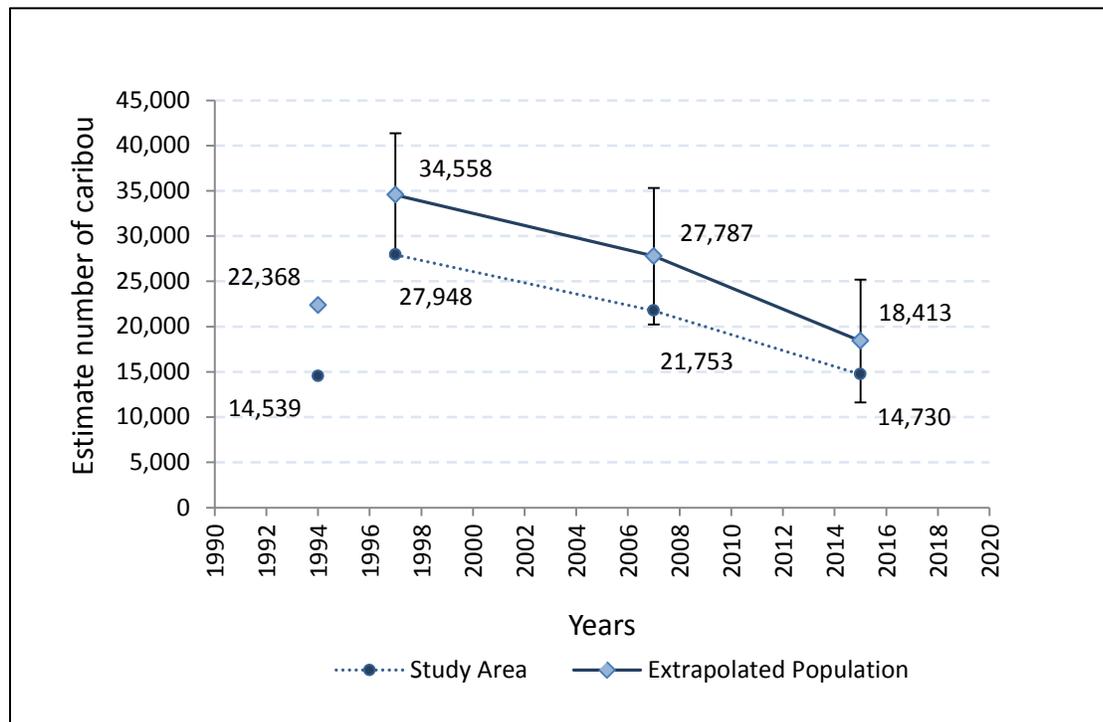
791 In June 1994, an aerial survey was undertaken in the western two-thirds of Victoria Island  
792 and estimated a total of  $14,539 \pm SE 1,016$  caribou which was later extrapolated to 22,368  
793 caribou (Dumond and Lee 2013) (Figure 7). Aerial census during the fall rut is the best  
794 approach for population surveys of Dolphin and Union Caribou, and this method was first  
795 developed and used in 1997 by Nishi and Gunn (2004). They surveyed the south coast of  
796 Victoria Island when Dolphin and Union Caribou were gathered, waiting for freeze up and  
797 estimated the population at  $27,948 \pm SE 3,367$  caribou. In 2007, Dumond estimated the  
798 population at  $21,753 \pm SE 2,343$  in the survey area on the south part of Victoria  
799 Island. Dumond later extrapolated his estimate by increasing it to  $27,787 \pm CI^5 7,537$ , to

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<sup>5</sup> Confidence Interval: "A confidence interval accompanies a survey estimate, to represent the variation that exists with this method. It means that if the survey were to be done repeatedly under the same conditions, the estimates would fall within that range. So with a 95% confidence interval, if the survey was repeated many

800 account for caribou that were outside the survey zone (Dumond 2013; Dumond and Lee  
 801 2013). This was completed by using information on collared caribou that had not yet  
 802 reached the coast at the time of the aerial survey. The same analysis was applied to the  
 803 1997 estimates resulting in a revised extrapolated estimate of  $34,558 \pm \text{CI } 6801$  caribou  
 804 (Dumond and Lee 2013). Statistically this decline is not significant ( $z = 1.21, p = 0.23$ ), but  
 805 when combined with other factors, it is thought that a decline is present for Dolphin and  
 806 Union Caribou (SARC 2013). A trend in the population is difficult to establish from two  
 807 estimates. Based on the 1997 and 2007 surveys, the conclusion to be made was that the  
 808 population remained at best stable over that decade, although without monitoring it is  
 809 impossible to consider how the herd number varied on an annual basis.

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812 Figure 7. Population estimates from 1994 to 2015.

813 An aerial population assessment was completed in fall 2015, with the extrapolated  
 814 population of Dolphin and Union Caribou estimated at  $18,413 \pm 6,795$  (95% CI, 11,664-  
 815 25,182) when using information for the current collared caribou (Leclerc and Boulanger in  
 816 prep.). This estimate shows signs of decline relative to the 2007 survey estimates (z-test,

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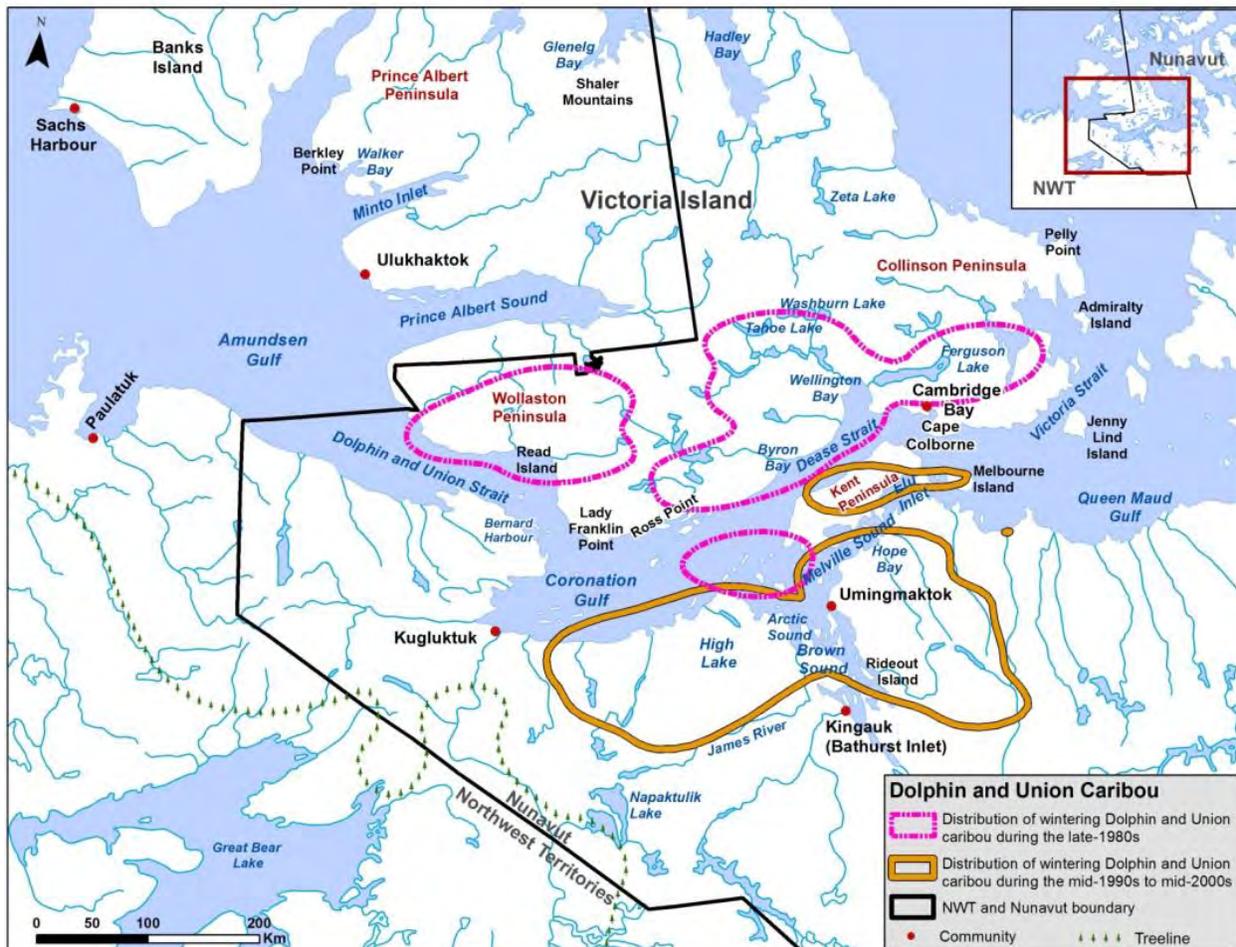
times, 95% of the time the estimates would fall within that range.” (Advisory Committee for Cooperation on Wildlife Management 2016, p. 8)

817 Z=-2.19, p=0.036). There has been an overall decline of 33.8%, or 5% annually since 1997.  
818 More research and monitoring of this population are needed to better understand the rate  
819 of decline. This compares with IQ and local knowledge collected in a study conducted from  
820 summer to winter 2014 in the community of Ikaluktutiak (Cambridge Bay) on Victoria  
821 Island, Kitikmeot Region, Nunavut. By the end of 2014, community residents reported  
822 observing 80% (IQR<sup>6</sup>: 75-90%) fewer Dolphin and Union Caribou in the Ikaluktutiak area  
823 (Cambridge Bay area) compared to what they used to see in the 1990s (Tomaselli et al.  
824 2016a). According to IQ and local knowledge, caribou began to decline around 2005, in  
825 conjunction with the decline of muskoxen observed in the same area. In addition, since the  
826 start of the decline, participants observed a decrease of the juvenile age class (calves and  
827 yearlings) that transitioned from 35% (IQR: 30-35) observed prior the decline to 20%  
828 (IQR: 15-30) during the decline; an overall decrease of the body condition status; and,  
829 finally, an overall increase in animals with abnormalities (morbidity) from 7.5% (IQR: 5-  
830 45) prior caribou decline to 30% (IQR: 10-47) during the decline (Tomaselli et al. 2016a).  
831 Thus, it will be important to monitor the Dolphin and Union Caribou herd closely over the  
832 next several years to obtain demographic characteristics and assess any further signs of  
833 decline in productivity and health of the population. More research and monitoring are  
834 planned by the GN.

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<sup>6</sup> IQR, or interquartile range, is a measure used in descriptive statistics to represent the variability or spread of the observations. In particular, it represents the spread of the 50% of the observations around the median value (Upton and Cook 1996).

836 **Distribution:**

837 Figure 8. Approximate distribution of wintering Dolphin and Union Caribou during the late  
 838 1980s (pink line), and the mid-1990s to mid-2000s (gold line), based on radio-collared  
 839 caribou. Data from Poole et al. (2010); figure reproduced from the SARC (2013) by B.  
 840 Fournier, GNWT-ENR 2016.

841 From their contracted distribution in the first half of the 20<sup>th</sup> century, the Dolphin and  
 842 Union Caribou range expanded eastward and southward (First Joint Meeting 2015) (see  
 843 Figures 4 and 8). Although most of this population crossed the Dolphin Strait at the  
 844 beginning of the century, the caribou are now more likely to cross closer to the Western  
 845 Queen Maud Gulf and Dease Strait (Poole et al. 2010). In addition, some Indigenous Peoples  
 846 indicate that over the last decade, they have observed Dolphin and Union Caribou outside  
 847 of the species' regular winter range, as far south as the treeline and north of Great Bear  
 848 Lake (Philip Kadlun of Kugluktuk, cited in Golder Associates Ltd. 2003). In the past 3-4  
 849 years around Cambridge Bay, Elders felt that the caribou were using a different migration  
 850 route (First Joint Meeting 2015). Although speculative, these changes may be related to  
 851 climate change as the caribou need to find safe ice to cross the strait. They may also need  
 852 to extend their winter range farther south to find available forage.

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## **5. THREATS AND LIMITING FACTORS**

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### ***5.1 Threat Assessment***

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The process of determining threats to Dolphin and Union Caribou was initiated at a joint meeting of co-management partners in Kugluktuk in March 2015 (First Joint Meeting 2015). This meeting included local communities, organizations and government agencies and was followed up by a second joint meeting in January 2016 in Cambridge Bay (Second Joint Meeting 2016). The threats identified during these meetings are documented and explained in this section.

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The Dolphin and Union Caribou threat assessment (Table 4) is based on the International Union for the Conservation of Nature (IUCN) - Conservation Measures Partnership unified threats classification system (2006). Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (population, species, community, or ecosystem) in the area of interest (global, national, or subnational). Limiting factors are not considered during this assessment process. Historical threats, indirect or cumulative effects of the threats, or any other relevant information that would help understand the nature of the threats are presented in Section 5.2. The threat classification table for Dolphin and Union Caribou (Table 4; Appendix A) was completed by a panel of IQ, TK and scientific experts on Dolphin and Union Caribou in December 2014 and updated in February 2016.

873 Table 4. Threat calculator assessment

Threat #	Threat	Impact <sup>a</sup>	Scope <sup>b</sup>	Severity <sup>c</sup>	Timing <sup>d</sup>	Description
1	Residential & commercial development	Negligible	Negligible	Extreme	High	
1.1	Housing & urban areas	Negligible	Negligible	Extreme	High	
3	Energy production & mining	Low	Restricted	Slight		
3.1	Oil & gas drilling	Not Calculated			Insignificant/ Negligible	
3.2	Mining & quarrying	Low	Restricted	Slight	High	• Mining (excluding roads / flights / shipping)
4	Transportation & service corridors	High	Pervasive - Large	Serious	Moderate	
4.1	Roads & railroads	Low	Restricted	Slight	Moderate	• Roads
4.2	Utility & service lines	Negligible	Negligible	Negligible	Unknown	
4.3	Shipping lanes	High	Pervasive - Large	Serious	High	• Marine traffic / ice breaking
4.4	Flight paths	Low	Restricted	Slight	High	• Scheduled flights
5	Biological resource use	Medium - Low	Pervasive	Moderate - Slight	High	
5.1	Hunting & collection	Medium - Low	Pervasive	Moderate - Slight	High	• Harvest
6	Human intrusions & disturbance	Negligible	Restricted	Negligible	High	
6.1	Recreational activities	Negligible	Negligible	Negligible	High	
6.2	War, civil unrest, & military exercises	Not Calculated			Insignificant/ Negligible	
6.3	Work & other activities	Negligible	Restricted	Negligible	High	• Unscheduled flights
8	Invasive & other problematic species & genes	High - Low	Pervasive	Serious - Slight	High	
8.1	Invasive non-native/alien species	Medium - Low	Large - Restricted	Moderate	High	• Parasites and diseases (both native and non-native)
8.2	Problematic native species	High - Low	Pervasive	Serious - Slight	High	• Predation (eg wolves, grizzly) • Competition (eg muskoxen) • Insect harassment
8.3	Introduced genetic material	Unknown	Large - Small	Unknown	High	• Interbreeding
9	Pollution	Not Calculated				
9.4	Garbage & solid waste	Not Calculated				
11	Climate change & severe weather	Medium - Low	Pervasive	Moderate - Slight	High	
11.1	Habitat shifting & alteration	Medium - Low	Pervasive	Moderate - Slight	High	• Sea ice loss • Vegetation changes
11.4	Storms & flooding	Medium - Low	Large	Moderate - Slight	Moderate	• Icing Events
<b>Overall Threat Impact: Very High - High</b>						

874 <sup>a</sup> Impact is calculated based on scope and severity. Categories include: very high, high, medium, low, unknown, negligible  
 875 <sup>b</sup> Scope is the proportion of the population that can reasonably be expected to be affected by the threat within the next 10 years. Categories include: Pervasive (71-100%); Large (31-70%); Restricted  
 876 (11-30%); Small (1-10%); Negligible (<1%), Unknown. Categories can also be combined (e.g., Large-Restricted = 11-70%).  
 877 <sup>c</sup> Severity is, within the scope, the level of damage to the species (assessed as the % decline expected over the next three generations [7years = 1 generation for Dolphin and Union Caribou]) due to  
 878 threats that will occur in the next 10 years. Categories include: Extreme (71-100%); Serious (31-70%); Moderate (11-30%); Slight (1-10%); Negligible (<1%), Unknown. Categories can also be  
 879 combined (e.g., Moderate to slight = 1-30%).  
 880 <sup>d</sup> Timing describes the immediacy of the threat. Categories include: High (continuing); Moderate (possibly in the short term [<10 years or three generations]); Low (possibly in the long term [>10  
 881 years or three generations]); Negligible (past or no direct effect); Unknown.

## 882 **5.2 Description of Threats**

883 Threats are the proximate activities or processes that directly and negatively affect the  
884 Dolphin and Union Caribou population. There are a variety of threats that affect Dolphin  
885 and Union Caribou and their habitat across Victoria Island and the mainland. The threats  
886 presented here represent those found in both the NWT and Nunavut.

887  
888 The overall calculated Threat Impact for this population is Very-High to High (Table 4).  
889 The most significant threats to Dolphin and Union Caribou are shipping lanes and  
890 predation. Other important threats are habitat change due to climate change (particularly  
891 sea ice loss), icing events, harvest, parasites, diseases and insect harassment. Mining, roads  
892 and aircraft flights are also threats to this species. Each threat discussed by the panel is  
893 described below from high to low impact and each threat category has a standard number  
894 that correlates to the IUCN classification system.

### 895 **5.2.1. Changes to sea ice affecting migration**

896 The threats that result in changes to sea ice affecting caribou migration (marine traffic  
897 [IUCN #4.3] and sea ice loss due to climate change [IUCN #11.1]) are discussed sequentially  
898 here due to their similar impacts, even though the causes differ.

#### 899 IUCN Threat #4.3 Shipping Lanes (High Impact)

900 An increase in shipping traffic when sea ice is forming or during the ice season poses a  
901 grave threat to Dolphin and Union Caribou. The threat is exacerbated by a continually  
902 growing shipping season (due to a shorter sea ice season) that allows more access through  
903 the straits for marine traffic. Combined, these two factors interfere with the formation of  
904 sea ice and increase the risk of caribou drowning.

905  
906 An increase in shipping, including icebreaking, is already evident in the straits between  
907 Victoria Island and the mainland - the primary migration route for Dolphin and Union  
908 Caribou (Poole et al. 2010; Dumond et al. 2013; ENR 2015b; ENR 2016; First Joint Meeting  
909 2015; Ekaluktutiak HTO 2016; Second Joint Meeting 2016). Similar observations were  
910 made with Peary Caribou (Miller et al. 2005), which can be related to Dolphin and Union  
911 Caribou. The number of transits through the Northwest Passage increased from four per  
912 year in the 1980s to 20-30 per year in 2009-2013 (ENR 2015b). The greater portion of  
913 these transits are icebreakers on coast guard and research duties, small vessels or  
914 adventurers, cruise ships, and tug and supply vessels with the majority of trips being made  
915 between August and October. A large portion of the rise in transits since the late 1980s is  
916 due to a rise in tug-supply vessels for the oil and gas industry, half of which have  
917 icebreaking capacity (ENR 2015b). The majority of ships travel through the Amundsen  
918 Gulf, Dolphin and Union Strait and Dease Strait, close to the Arctic mainland. Only 8% of  
919 transits travel the Beaufort Sea through the northern routes around Banks Island (ENR  
920 2015b). Overall, annual commercial use of the Northwest Passage by ships with  
921 icebreaking capacity or that are escorted by icebreakers has been increasing rapidly.  
922 Higher risk of oil or waste spills, changes in ice conditions due to leads by ship wakes, and

923 impacts on wildlife and marine species are some potential effects of increased shipping  
924 activities (ENR 2015b; ENR 2016).

925  
926 Indigenous communities have observed this rise in marine traffic and are concerned about  
927 its impacts on sea ice formation. They have already noted an increase in the number of  
928 caribou drownings in recent years, sometimes hundreds of caribou (Thorpe et al. 2001;  
929 Miller et al. 2005; First Joint Meeting 2015; Second Joint Meeting 2016). One harvester  
930 mentioned that he had seen a ship break through 12 inches of ice in the third week of  
931 October during fall migration (Ekaluktutiak HTO 2016). Another community member  
932 explained that a further increase in shipping will likely not allow adequate time for the ice  
933 to re-freeze, since three inches of ice is needed to allow caribou to cross (First Joint Meeting  
934 2015). The community's concerns extend to the safety of harvesters and others out on the  
935 ice as well as other species including muskox (Ekaluktutiak HTO 2016).

936  
937 Researchers have also noted an increase in shipping, changes in timing and patterns of sea  
938 ice formation and its impact on caribou migration. Dumond et al. (2013) documented a  
939 delay in migratory movements due to the temporary maintenance of an open-water boat  
940 channel at Cambridge Bay in 2007. Shipping during the ice free season (June to August)  
941 has a negligible impact on Dolphin and Union Caribou. However, if shipping were to  
942 become year round, or earlier in the spring or late fall, there could potentially be further  
943 consequences for Dolphin and Union Caribou. An increase in shipping activities in October  
944 would impact sea ice formation, which could then impact Dolphin and Union migration  
945 (Table 2). Some researchers suggest that year round marine traffic and ice breaking  
946 activities could ultimately prevent the Dolphin and Union Caribou's fall and spring  
947 migrations altogether and fragment the Dolphin and Union range (Miller et al. 2005).

948  
949 There is a strong economic incentive to allow more shipping and ice breaking activity in  
950 Canada's Arctic, particularly through the Northwest Passage. Nationally, it would provide  
951 opportunities for exploration and extraction of natural resources. It would also allow more  
952 access to tourism, particularly cruise ships traveling through the open channels.

953 Internationally, the appeal of the Northwest Passage lies in the 11,000 km that would be  
954 removed from the Europe-Asia route through the Panama Canal and the 19,000 km that  
955 would be cut off the trip around Cape Horn for the supertankers that are too big to use the  
956 Panama Canal (Kerr, as cited in Miller et al. 2005). In fact, year-round shipping, and/or the  
957 creation of shipping lanes through Arctic waters have already been proposed as part of  
958 some resource extraction projects (Miller et al. 2005; Dumond et al. 2013) and the  
959 Canadian Coast Guard has been tasked with developing Northern Marine Transportation  
960 Corridors (Canadian Coast Guard 2014).

961 IUCN Threat #11.1 Habitat Shifting and Alteration\* (Medium - Low Impact)

962 \*Note - This threat as assessed includes vegetation changes, discussed in Section 5.2.5.

963  
964 Among the many impacts of climate change across the Arctic (see the other aspects of IUCN  
965 Threat #11.1 Habitat Shifting and Alteration, below), the most significant impact for

966 Dolphin and Union Caribou is the change in sea ice along their migratory route. As noted in  
967 the threat listed above (shipping lanes), thinner and/or unstable ice cannot support the  
968 weight of caribou during their migration.

969  
970 Warming temperatures in the Arctic are causing ice freeze-up to take place later in the fall,  
971 and spring thaw to take place earlier in the season (Miller et al. 2005; Gunn 2008; Poole et  
972 al. 2010; First Joint Meeting 2015; Kugluktuk HTO 2016; Second Joint Meeting 2016). On  
973 the south coast of Victoria Island, warmer fall temperatures have been recorded over the  
974 last sixty years, resulting in delays in sea ice formation. New ice formation (newly formed,  
975 less than 10 cm thick) occurred 10 days later in 2008 than in 1982, and grey ice formation  
976 (10-15 cm thick) formed 8 days later during the same period (Poole et al. 2010). Warmer  
977 temperatures diminish the chances of sea ice achieving uniform thickness and Inuit have  
978 reported high mortality among Dolphin and Union Caribou due to migration over thin,  
979 unstable and freshly formed sea ice (First Joint Meeting 2015; Second Joint Meeting 2016).  
980 Although caribou can swim, they are unlikely to cross distances longer than a few  
981 kilometres (Dumond et al. 2013) and sometimes cannot pull themselves out of the water  
982 (SARC 2013).

983  
984 Climate change is seen by some Inuit as the most important threat for Dolphin and Union  
985 Caribou (First Joint Meeting 2015; Kugluktuk HTO 2016). With the change in sea ice  
986 formation, some Dolphin and Union Caribou may not complete their migration to the  
987 mainland and instead are left stranded on the ice, where they drift out to sea. They  
988 eventually perish from starvation and/or exhaustion, while attempting to swim back to  
989 land (Kugluktuk HTO 2016). There are hunters who have seen up to 150 caribou floating  
990 on a piece of ice in the Coronation Gulf and sometimes they are even found frozen into the  
991 sea ice with their head protruding from the ice (First Joint Meeting 2015). Other caribou  
992 have been known to swim to land but have perished soon after emerging from the water  
993 (Allen Niptanatiak and Dustin Fredlund, as cited in Dumond et al. 2013). Of the caribou  
994 who survive, in recent years, hunters have observed an increasing number on the mainland  
995 with a thick coat of ice on their fur, indicating that caribou fell through the ice but were able  
996 to make it to the nearby shore of the mainland (Poole et al. 2010; Dumond et al. 2013;  
997 Kugluktuk HTO 2016). Ice build-up on their fur is challenging for caribou and adds to their  
998 stress (Kugluktuk HTO 2016).

999  
1000 With the delay in freeze up, caribou may waste energy changing their movement pattern in  
1001 the east-west direction looking for an ice formation that will allow them to start migration.  
1002 One community member noted that Dolphin and Union Caribou were still migrating past  
1003 Cambridge Bay in January of 2016, which was surprising since the caribou have usually  
1004 finished their migration by January (Second Joint Meeting 2016). Other harvesters have  
1005 noticed that some caribou try to cross the sea ice earlier than in the past, which is  
1006 becoming increasingly dangerous (Kugluktuk HTO 2016).

1007  
1008 The delay in freeze-up and milder fall conditions could also result in a longer staging time  
1009 on the south coast of Victoria Island. This delay forces Dolphin and Union Caribou to use

1010 summer fat reserves and may also increase grazing pressure on portions of their range  
1011 (Poole et al. 2010). A longer staging time, particularly on the southern coast of Victoria  
1012 Island, also results in increased vulnerability to predation and harvest (Poole et al. 2010).

1013

#### 1014 Cumulative Impacts of Changes to Sea Ice

1015 Given their migration patterns, seasonal connectivity of the sea ice between Victoria Island  
1016 and the mainland is essential to Dolphin and Union Caribou. Combined, marine traffic  
1017 (calculated as a high impact threat) and climate change (calculated as a medium-low  
1018 impact threat) can affect ice formation to the point where this species may be forced to  
1019 stop their migrations. It is questionable whether Victoria Island could support a self-  
1020 sustaining population if the ability to cross the ice is lost (Miller et al. 2005; Dumond et al.  
1021 2013). Although there was a time historically when migration across the sea ice stopped  
1022 and caribou remained on Victoria Island year-round, caribou numbers at that time were  
1023 extremely low, possibly due to icing events and the introduction of rifles (Manning 1960;  
1024 Gunn 1990). Later in the 20<sup>th</sup> century, as the population increased, their migration  
1025 resumed. It is believed that the sea ice connection may have been fundamental to the  
1026 recovery of the Dolphin and Union Caribou (see Section 4.4).

1027

### 1028 **5.2.2 Predation and competition**

#### 1029 IUCN Threat #8.2 Problematic Native Species (High - Low Impact)

1030 There are various species that may negatively affect the Dolphin and Union Caribou  
1031 through predation or competition, but there is still uncertainty around their impacts at a  
1032 population level.

1033

#### 1034 ***Arctic Wolves (Canis lupus arctos)***

1035 Wolves are the primary predators of Dolphin and Union Caribou and their pressure on the  
1036 population size is difficult to measure. Community members have noticed an increase in  
1037 wolf numbers over the last 10 to 20 years. In interviews conducted in the 1990s, it was felt  
1038 this increase did not have a negative effect on caribou (Adjun 1990); but more recently,  
1039 Inuit and Inuvialuit have expressed serious concerns over a rise in wolf numbers and its  
1040 potential impacts (Ulukhaktok TK interviews 2011-2013; First Joint Meeting 2015;  
1041 Ekaluktutiak HTO 2016; Kugluktuk HTO 2016; Second Joint Meeting 2016). One hunter  
1042 reported that he saw seven or eight caribou taken down by wolves within one mile (Second  
1043 Joint Meeting 2016). Some Indigenous Peoples have voiced concern that wolf predation is  
1044 not being given enough attention, considering that wolves are the primary predators of  
1045 Dolphin and Union Caribou (Ekaluktutiak HTO 2016).

1046

1047 In the 1960s, Inuit would traditionally track down wolf dens and kill wolf pups as a  
1048 measure to control wolf numbers. Nowadays, this practice is becoming less common and  
1049 these specific skill sets are slowly vanishing (First Joint Meeting 2015).

1050

1051 There is little scientific information available on wolf abundance or its impacts on caribou.  
1052 Sightings of wolves during aerial surveys for caribou and muskoxen have increased (SARC  
1053 2013), although it is important to note that predator observations during aerial surveys are  
1054 not indicative of a species' population size. Numbers of muskoxen increased on Victoria  
1055 Island in the 1990s (Gunn and Patterson 2012) and it has been theorized that the muskox  
1056 population may support more wolves, leading to a potential increase in predation of  
1057 Dolphin and Union Caribou (SARC 2013). However, there is no direct scientific information  
1058 on predation rates. More research is needed to learn about wolf interactions with Dolphin  
1059 and Union Caribou.

1060

### 1061 ***Grizzly Bear (Ursus arctos)***

1062 Since the early 2000s, more grizzly bears have been observed on Banks Island and Victoria  
1063 Island than in the past (Dumond et al. 2007; Slavik 2011; SARC 2013; First Joint Meeting  
1064 2015; Joint Secretariat 2015; Ekaluktutiak HTO 2016; Olohaktomiut HTC 2016). This  
1065 increase could be related to fewer bears being shot for food (Dumond et al. 2007) and/or a  
1066 northward expansion of their range, perhaps due to changes in habitat and prey availability  
1067 (SARC 2012a; SARC 2012b; SARC 2013; First Joint Meeting 2015). Grizzly bears usually  
1068 focus their predation efforts on young caribou, particularly newborn calves. However, with  
1069 the dispersed calving practices of Dolphin and Union Caribou, the impact of grizzly bears  
1070 on this population may be limited (SARC 2013).

1071

### 1072 ***Other predators***

1073 Indigenous Peoples are also seeing more bald eagles. This presents further challenges to  
1074 Dolphin and Union Caribou because bald eagles, like golden eagles, feed on calves  
1075 (Kugluktuk HTO 2016).

1076

### 1077 ***Muskoxen (Ovibos moschatus) and other herbivores***

1078 Some Indigenous Peoples cite muskoxen as having a negative influence on Dolphin and  
1079 Union Caribou due to competition for forage and/or avoidance (Gunn 2005; Ekaluktutiak  
1080 HTO 2016; Olohaktomiut HTC 2016). According to IQ and TK sources, muskoxen have  
1081 been known to trample the ground and dig up plants, decreasing available forage for  
1082 caribou (Ulukhaktok TK interviews 2011-2013). Some TK holders have expressed concern  
1083 over the relationship between caribou and muskox, noting that muskoxen are known to  
1084 displace the caribou by their smell (Ulukhaktok TK interviews 2011-2013). Other TK  
1085 holders such as those near Umingmaktok, say that for the last 25 years, they have observed  
1086 caribou and muskox sharing habitat and grazing next to each other during the winter  
1087 months (First Joint Meeting 2015).

1088

1089 There are differing opinions in the scientific literature about whether and under what  
1090 conditions muskoxen and other herbivores (e.g., hare, ptarmigan and lemming) compete  
1091 with caribou for forage or space (Larter et al. 2002; Gunn and Adamczewski 2003). Muskox  
1092 abundance increased on Victoria Island in the 1980s and 1990s (Gunn and Paterson 2012),  
1093 but showed a decline from 2013-2014 (L. Leclerc, pers. comm. 2016). Schaefer et al.  
1094 (1996) found that the habitat use patterns of muskoxen, hares and ptarmigan foraging on

1095 southeast Victoria Island in the 1990s did not overlap with caribou. However, Hughes  
1096 (2006) found overlap in diet and habitat use between muskoxen and caribou on southern  
1097 Victoria Island in the mid-2000s and suggested that inter-specific competition was taking  
1098 place. It has also been suggested that muskoxen (as alternate prey) could sustain wolf  
1099 predation on Dolphin and Union Caribou, or could influence caribou-parasite relationships  
1100 (Hughes et al. 2009; SARC 2013).

1101

### 1102 **Geese**

1103 Populations of Snow Geese (*Chen caerulescens*) and Ross's Geese (*Chen rossii*) on the east  
1104 side of the Dolphin and Union Caribou wintering range have increased to well above their  
1105 population objectives; they have now been designated as overabundant (CWS Waterfowl  
1106 Committee 2014; 2015). The population of Greater White-fronted Geese (*Anser albifrons*)  
1107 has also increased substantially since the late 1980s (CWS Waterfowl Committee 2015). In  
1108 the Queen Maud Gulf, geese have become so abundant, they have expanded beyond prime  
1109 nesting sites to marginal sites. Their substantial populations are affecting the vegetation,  
1110 which raised concerns that arctic ecosystems were possibly imperiled through intensive  
1111 grazing (Batt 1997). Their impacts include vegetation removal through the alteration or  
1112 elimination of plant communities, which can transform the soil into mud and can cause  
1113 changes to soil salinity, nitrogen dynamics and moisture levels (CWS Waterfowl Committee  
1114 2014; 2015). Communities indicate that these changes compromise Dolphin and Union  
1115 Caribou forage during winter (First Joint Meeting 2015; Second Joint Meeting 2016). Snow  
1116 geese and Ross's geese are subject to special conservation measures to control their  
1117 abundance but success of the measures to date has been mixed (CWS Waterfowl  
1118 Committee 2014).

1119

1120 Inuit and Inuvialuit have also noted an overabundance of geese over the past decade (First  
1121 Joint Meeting 2015). In particular, they point out the resulting habitat destruction on  
1122 Victoria Island. To date, there has been no scientific research examining the impacts of  
1123 habitat destruction on caribou specifically, but community members have voiced concern  
1124 over this trend (First Joint Meeting 2015).

1125

### 1126 **5.2.3 Harvest**

#### 1127 IUCN Threat #5.1 Hunting and Collecting (Medium – Low Impact)

1128 Although this threat was assessed according to IUCN criteria as having a medium-low  
1129 impact, arguments could be made to rank the threat as a high-low impact due to  
1130 uncertainty of harvest levels. At the December 2014 meeting of scientific and TK experts,  
1131 the impact classification was high-low. This was later changed to medium-low impact in  
1132 February 2016 as the panel of experts felt this was more representative of the current  
1133 impact of harvesting, given that the population has been less accessible to communities in  
1134 recent years.

1135

1136 Harvest is important to beneficiaries in the communities within the range of the Dolphin  
1137 and Union Caribou population. Dolphin and Union Caribou can currently be lawfully  
1138 harvested by Indigenous Peoples and resident and non-resident hunters (defined in  
1139 Section 3.1) throughout the Nunavut and NWT<sup>7</sup> range. Harvesting directly affects the  
1140 caribou population by removing individuals from the herd. The impact of harvest is less  
1141 important when caribou are abundant and numbers are increasing, particularly if the rate  
1142 of harvest is low. However, harvest can have a negative impact when the population is  
1143 declining or low, particularly if the rate of harvest is high. The effects of harvest on a  
1144 population depend not just on the total number of caribou taken, but also on the sex ratio  
1145 and age structure of the harvest, and whether the population is increasing, decreasing or  
1146 stable.

1147  
1148 Currently, harvest levels and overall harvest rate for the Dolphin and Union Caribou  
1149 population are unknown. Therefore, there is uncertainty around how harvest affects the  
1150 population trend. Harvest can have a greater impact on the population trend when the  
1151 population is declining, since it exacerbates the decline, but the magnitude and extent of  
1152 the impact is unknown. Previous harvest studies provide an indication of harvest levels at  
1153 the time (see Section 3.2), but reporting was not (and still is not) mandatory for  
1154 subsistence harvest. Therefore, the lack of recent data on harvest numbers and the  
1155 challenges of identifying harvested caribou according to their population, creates  
1156 considerable uncertainty in estimating harvest levels.

1157

#### 1158 **5.2.4 Parasites, diseases and insect harassment**

##### 1159 *IUCN Threat #8.1 Invasive Non-native\* Alien Species (Medium - Low Impact)*

1160 \*Note – both native and non-native diseases/parasites were considered in this category

1161

1162 Parasites, disease and insect harassment pose a moderate threat to Dolphin and Union  
1163 Caribou through effects on body condition, pregnancy rates, and survival. Warmer  
1164 temperatures allow for transmission of new parasites and diseases, and a longer staging  
1165 time before fall migration creates prolonged exposure to these parasites and a potential  
1166 increase in the rate of infection (Poole et al. 2010; Kutz et al. 2015; Tomaselli et al. 2016a).  
1167 Local communities have reported a rise in diseased caribou (Poole et al. 2010; First Joint  
1168 Meeting 2015; Tomaselli et al. 2016a) and some Inuit have expressed concern about its  
1169 potential impacts on human health when consuming the meat (Kugluktuk HTA 2016;  
1170 Olohaktomiut HTC 2016; Leclerc and Boulanger in prep.).

---

<sup>7</sup> At the time of publication of this document, in the NWT, non-resident harvest is not taking place since there are no tags allocated for non-resident hunters.

1171  
1172 Concern has been expressed by researchers and communities about brucellosis in Dolphin  
1173 and Union Caribou and its potential impacts (Ekaluktutiak HTO 2016; First Joint Meeting  
1174 2015; Kutz et al. 2015; Olohaktomiut HTC 2016; Second Joint Meeting 2016). The *Brucella*  
1175 bacterium (which causes Brucellosis) is known to circulate in northern caribou and is  
1176 endemic in many populations. It was recently confirmed in Dolphin and Union Caribou  
1177 (Kutz et al. 2015). Its confirmation was not surprising, as it is known that caribou across  
1178 the barrenlands are periodically infected. Brucellosis is an important cause of infertility in  
1179 caribou and may play an important role in population declines (Kutz et al. 2015). For  
1180 example, *Brucella* was associated with the population decline of the Southampton barren-  
1181 ground caribou population after it was newly introduced to that population (Government  
1182 of Nunavut 2013). The bacterium also causes swollen joints, which can make caribou more  
1183 susceptible to predation. Since the mid-2000s, more caribou have been observed with  
1184 swollen joints and/or limping in the Cambridge Bay area (Tomaselli et al. 2016a). The  
1185 bacterium has also been found in muskoxen in the same area (Tomaselli et al. 2016b;  
1186 Tomaselli, PhD candidate, Faculty of Veterinary Medicine, University of Calgary, pers.  
1187 comm. 2017).

1188  
1189 Another bacterium, *Erysipelothrix rhusiopathiae*, appears to cause rapid death of animals in  
1190 muskoxen and has been implicated in widespread muskox mortalities in the Western  
1191 Canadian Arctic and Alaska (Kutz et al. 2015). Its impact on caribou is less clear, however  
1192 the bacterium has been implicated as the cause of death in some barren-ground caribou  
1193 and woodland caribou in Nunavut, Alberta and B.C. (Kutz et al. 2015; Schwantje et al.  
1194 2014). Serology shows that some Dolphin and Union Caribou have been exposed to the  
1195 bacterium, indicating that it is circulating in the Dolphin and Union Caribou population  
1196 (Kutz et al. 2015). It has been suggested that this pathogen might play a role in future  
1197 Dolphin and Union Caribou population dynamics (Kutz et al. 2015).

1198  
1199 Two types of lungworms and muscle worms have been detected in Dolphin and Union  
1200 Caribou. Previously absent in the Arctic islands, *Varestrongylus eleguneniensis* was first  
1201 discovered on Victoria Island in 2010 and affects both caribou and muskoxen (Kutz et al.  
1202 2014). The impacts on caribou are not known; however, it is not likely a major cause of  
1203 disease (Kutz et al. 2015). It is believed this parasite was introduced by Dolphin and Union  
1204 Caribou migrations to Victoria Island and warming temperatures have allowed its survival  
1205 and spread. With warmer temperatures and a longer staging time on the island due to later  
1206 freeze-up, there is now greater opportunity for exposure to the *Varestrongylus* parasite and  
1207 greater risk of transmission of both this and potentially other diseases (Kutz et al. 2014;  
1208 Poole et al. 2010; Tomaselli et al. 2016a).

1209  
1210 The second species which was recently detected in Dolphin and Union Caribou is  
1211 *Parelaphostrongylus andersoni* (Kafle et al. in review). Found in caribou across the North  
1212 American mainland, this parasite lives in the muscles of caribou and travels to the lungs via  
1213 the bloodstream. In high numbers, the *Parelaphostrongylus* parasite can cause muscle  
1214 inflammation and wasting as well as lung disease as the eggs and larvae migrate through

1215 the lungs (Kutz et al. 2015). The recent detection of this species is the first report of this  
1216 parasite in Dolphin and Union Caribou and could signal a possible range expansion (Kafle  
1217 et al. in review).

1218  
1219 Nematode roundworms are commonly found as gastrointestinal parasites in caribou and  
1220 muskoxen and at least two species are shared between muskoxen and Dolphin and Union  
1221 Caribou (Kutz et al. 2014). At high levels, nematode parasites can cause reduced body  
1222 condition and pregnancy rates (Hughes et al. 2009; Kutz et al. 2014). In recently collected  
1223 Dolphin and Union Caribou samples, *Marshallagia marshalli* was detected, but at low levels  
1224 that are not cause for concern (Kutz et al. 2015).

1225  
1226 Warming trends in the Arctic are responsible for longer summers associated with a rise in  
1227 insect harassment (First Joint Meeting 2015; Russell and Gunn 2016). This trend has been  
1228 observed since the 1970's (Thorpe et al. 2001; Dumond et al. 2007). In particular, warm  
1229 and dry weather is responsible for an increase in mosquitos while warm and wet summers  
1230 produce more warble flies and nose bot flies (Dumond et al. 2007). Warmer temperatures  
1231 have also allowed for an increase in the number of biting flies and the length of time they  
1232 are out. Indigenous Peoples have observed an increase in warble flies, nasal bot flies and  
1233 mosquitos on Victoria Island; where warble flies were previously observed only in the  
1234 summer, they are now being seen in the spring as well (Bates 2007; Dumond et al. 2007).  
1235 In the mainland part of the range, from 2000-2014 there was an increasing trend in  
1236 cumulative January-June growing degree days, reflecting warming temperatures, as well as  
1237 an increasing trend in the warble fly index (based on temperature and wind) (Russell and  
1238 Gunn 2016).

1239  
1240 With this increase in insects, caribou have been seen constantly running from or shaking  
1241 off swarms of insects (Kugluktuk HTO 2016). In one severe case, a community member  
1242 observed caribou running non-stop, back and forth over the period of a day as they tried to  
1243 seek relief (First Joint Meeting 2015). The insects can sometimes be numerous enough that  
1244 the caribou are forced to move kilometres back and forth. This avoidance behaviour uses  
1245 energy and prevents caribou from eating, which affects both fat stores and body condition  
1246 (First Joint Meeting 2015; Kugluktuk HTO 2016; Second Joint Meeting 2016). Lack of body  
1247 fat influences the ability of Dolphin and Union Caribou to become pregnant, survive water  
1248 crossings, migration and the winter season. Hughes et al. (2009) found that female Dolphin  
1249 and Union Caribou with a high burden of warble infestation had less fat and a lower  
1250 probability of being pregnant.

1251

## 1252 **5.2.5 Other habitat changes due to climate change**

### 1253 IUCN Threat #11.1 Habitat Shifting and Alteration\* (Medium - Low Impact)

1254 \*Note - This threat as assessed includes sea ice loss, discussed above under Section 5.2.1.

1255

1256 There are already many observations of warming temperatures caused by climate change  
1257 across the Arctic (Riedlinger and Berkes 2001; Nichols et al. 2004; Hinzman et al. 2005;  
1258 Barber et al, as cited in Poole et al. 2010; IPCC 2014; First Joint Meeting 2015) and warmer  
1259 summer temperatures have been documented in the range of Dolphin and Union Caribou  
1260 (Poole et al. 2010). The impacts of climate change on Dolphin and Union Caribou include  
1261 sea ice loss (discussed in Section 5.2.1) increased insect harassment, and changes to  
1262 diseases and parasites (both discussed in Section 5.2.4). There has been very little  
1263 assessment of other changes to Dolphin and Union Caribou habitat, but changes to  
1264 vegetation could impact the population, since the timing and amount of forage available  
1265 influences body mass, pregnancy rates and survival (Thomas 1982; Heard 1990; Gerhart et  
1266 al. 1997; Thorpe et al. 2001).

1267 The warming trend in the Arctic has created a measurable increase in plant productivity  
1268 (Normalized Difference Vegetation Index, or NDVI) across the western Arctic Islands  
1269 (Barber et al. 2008; Walker et al. 2011). Changes in plant growth on the tundra were  
1270 noticed by participants in an IQ study in the 1990s. They found that the vegetation on  
1271 Victoria Island was becoming more diverse and plentiful with warming temperatures  
1272 (Thorpe et al. 2001). Such observations suggest that more and better forage may be  
1273 increasingly available on Victoria Island for caribou. However, in TK interviews conducted  
1274 from 2011-2013 in Ulukhaktok, poor plant growth linked to dry conditions and freezing  
1275 was raised as a concern for caribou (Ulukhaktok TK interviews 2011-2013).

1276 Overall, the impacts of climate change on vegetation are complex and there is currently not  
1277 enough information available to determine whether the cumulative impacts from climate  
1278 change will generally prove positive or negative for Dolphin and Union Caribou.  
1279

## 1280 **5.2.6 Icing events**

### 1281 *IUCN Threat #11.4 Storms and Flooding (Medium – Low impact)*

1282 Freeze-thaw events and freezing rain can make a layer of ice on the ground or snow that  
1283 covers vegetation and makes it inaccessible to foragers (Elias 1993; Ulukhaktok TK  
1284 interviews 2011-2013). Since only part of the range is affected, these events are localized  
1285 and may affect only a portion of the population. Where there are large areas affected by  
1286 icing events, Dolphin and Union Caribou have to live off their fat reserves or move  
1287 elsewhere, and may perish from starvation (Elias 1993; Thorpe et al. 2001; Ulukhaktok TK  
1288 interviews 2011-2013). Researchers sometimes associate the years of frequent icing events  
1289 with a reduction in caribou numbers and fewer harvesting opportunities (Thorpe et al.  
1290 2001). For example, in the winter of 1987-88 Cambridge Bay hunters reported freezing  
1291 rain and caribou dying along the coast; caribou carcasses were later found that appeared to  
1292 have been malnourished (Gunn and Fournier 2000).

1293  
1294 There are indications that icing events are becoming more common in the Dolphin and  
1295 Union Caribou range. Knowledge holders from the Bathurst Inlet area interviewed by  
1296 Thorpe et al. (2001) reported an increase in the frequency of freezing rain and freeze-thaw

1297 cycles in the 1990s, and some knowledge holders from Ulukhaktok recently reported that  
1298 freezing rain was happening more now than in the past (Ulukhaktok TK interviews 2011-  
1299 2013). Scientists have also expressed concern that icing events will become more frequent  
1300 since climate change models predict warmer temperatures and greater precipitation in the  
1301 Arctic (e.g., Rinke and Dethloff 2008; Vors and Boyce 2009; Festa-Bianchet et al. 2011). As  
1302 such, icing events have the potential to become a serious threat to Dolphin and Union  
1303 Caribou.  
1304

## 1305 **5.2.7 Mining**

### 1306 IUCN Threat #3.2 Mining and Quarrying\* (Low Impact)

1307 \*Note - This threat as assessed does not include roads, flights or shipping associated with  
1308 mines. These are considered under IUCN Threats numbers: 4.1 - Roads and railroads, 4.3 –  
1309 Shipping Lanes, 4.4 – Flight paths and 6.3 – Work and other activities.  
1310

1311 Industrial development, particularly mining and activities related to mining, have been  
1312 identified as a threat to Dolphin and Union Caribou and on the mainland. There are mining  
1313 exploration projects located in their winter range and one mine is currently entering its  
1314 operational phase. There is evidence that mining impacts caribou distribution on a local  
1315 and regional scale as caribou respond to industrial projects by selecting habitat at  
1316 increasing distances up to the estimated zone of influence (area of reduced caribou  
1317 occupancy) (Boulangier et al. 2012). Even a small spatial disturbance can have a major  
1318 effect on caribou (Forbes et al. 2001) and impacts appear to be more important during the  
1319 calving and pre-calving period (Weir *et al.*, 2007; Dyer *et al.*, 2001; Nellemann *et al.*, 2001).  
1320 Some research has indicated a decrease in reproductive rates associated with an increase  
1321 in industrial activities due to habitat alteration, loss or fragmentation (Nellemann et al.  
1322 2003). If mines are developed or expanded, they could impact caribou movements, displace  
1323 caribou from winter foraging sites, and increase access for hunting (SARC 2013). Future  
1324 mining projects and possible expansion of current mining activities have the potential to  
1325 disrupt migration corridors and winter feeding grounds (Tuktoyaktuk Community Meeting  
1326 2014; First Joint Meeting 2015; Ekaluktutiak HTO 2016; Olohaktomiut HTC 2016; Paulatuk  
1327 HTC 2016; Second Joint Meeting 2016). Once industrial operations cease, concerns may be  
1328 raised during site cleanups; for example, a caribou was seen with barbed wire from an old  
1329 Distant Early Warning (DEW) line site caught in its antlers (First Joint Meeting 2015).  
1330 Although the overall impact of mines to Dolphin and Union Caribou was assessed as low, it  
1331 was recognized that a higher percentage of the caribou population may be directly affected  
1332 by mines in the future (Appendix A).  
1333

## 1334 **5.2.8 Roads**

### 1335 IUCN Threat #4.1 Roads and Railroads (Low Impact)

1336 Roads currently have a very small effect on the Dolphin and Union Caribou population, but  
1337 they could become more of an issue within the next 10 years if the mines and associated  
1338 roads that are currently being proposed are developed. For example, KIA and the  
1339 Government of Nunavut have proposed a mine with an all-weather road ending at Grays  
1340 Bay, west of Bathurst Inlet; the transportation system is known as the Grays Bay Road and  
1341 Port Project (GBRP). Once completed, it will include 227 km of road connecting the rich  
1342 mineral resources of Canada to the Arctic shipping routes.

1343  
1344 Permanent or temporary roads such as winter roads may influence the spring migration by  
1345 crossing the caribou migration route (Olohaktomiut HTC 2016). A proposed road to  
1346 connect mines to a new port in Bathurst Inlet could also impact caribou (Back River Project  
1347 2015). Even a single road in the range of Dolphin and Union Caribou could be encountered  
1348 by a large proportion of the caribou population. Roads also allow increased access for  
1349 hunters – something that has proven to be a serious issue for other caribou (Vistnes and  
1350 Nellemann 2008; J. Adamczewski Wildlife Biologist, Ungulates, GNWT, ENR, pers. comm.  
1351 2016) and for animals in general (Benítez-López et al. 2010).

1352  
1353 Combined with direct mortality, there could be indirect effects from roads, such as changes  
1354 to caribou movements, and/or displacement from winter foraging sites (SARC 2013).  
1355 Disturbances such as vehicles can increase energetic costs for caribou if the disturbances  
1356 interrupt caribou feeding or cause them to move away (Weladji and Forbes 2002).

1357

### 1358 **5.2.9 Flights**

1359 This section refers to scheduled flights [IUCN #4.4] and flights for other purposes such as  
1360 research, outfitting and industrial activities [IUCN #6.3].

1361  
1362 Caribou are not necessarily disturbed by all air traffic, but low-level aircraft flights and the  
1363 associated noise can disturb them and lead to increased energetic costs (Weladji and  
1364 Forbes 2002; First Joint Meeting 2015; Ekaluktutiak HTO 2016; Olohaktomiut HTC 2016;  
1365 Second Joint Meeting 2016;). Community members have voiced concern over aircraft,  
1366 emphasizing that flights, particularly around mining sites, are already bothering Dolphin  
1367 and Union Caribou. Some communities note there appears to be an increase in unscheduled  
1368 aircraft and helicopter flights, and they have voiced unease about the impacts in terms of  
1369 flight frequency, height and noise (Ekaluktutiak HTO 2016; Kugluktuk HTO 2016;  
1370 Olohaktomiut HTC 2016). Communities are also worried about industry failing to respect  
1371 guidelines (Ekaluktutiak HTO 2016; Kugluktuk HTO 2016; Olohaktomiut HTO 2016;  
1372 Second Joint Meeting 2016). It has been suggested that flights should be at high altitude  
1373 over calving areas or should not be allowed at all where caribou are calving (SARC 2013;  
1374 First Joint Meeting 2015; Ekaluktutiak HTO 2016; Kugluktuk HTO 2016; Second Joint  
1375 Meeting 2016).

1376  
1377 From 2010 to 2014, the average number of airplane and helicopter takeoffs and landings  
1378 per day at airports was 3.7 in Ulukhaktok, 9.1 in Kugluktuk, and 14.1 in Cambridge Bay

1379 (Statistics Canada 2014). This statistic does not include flights taking off from other  
1380 locations such as field camps and mine sites.

1381 *IUCN Threat #4.4 Flight Paths\* (Low Impact)*

1382 \*Note - This threat as assessed includes scheduled flights only.  
1383

1384 An increase in mining activities may result in more scheduled flights, which could increase  
1385 the level of disturbance to Dolphin and Union Caribou. In the future, scheduled flights to  
1386 mines could outnumber flights to communities, although flights would be mostly at high  
1387 altitude and would disturb caribou during takeoff and landing. Caribou may also be  
1388 disturbed if current flight paths for scheduled flights were altered to overlap with calving  
1389 areas.

1390 *IUCN Threat #6.3 Work and Other Activities (Negligible Impact)*

1391  
1392 Helicopters and fixed-wing aircraft used by surveyors, mine workers, outfitters, the  
1393 military, and researchers can be disruptive to Dolphin and Union Caribou, particularly  
1394 during the calving season. Flights around mine sites to move equipment and workers, and  
1395 conduct other mine-related work, creates disturbance, and flights around field camps to  
1396 carry out research can also be disruptive to Dolphin and Union Caribou.  
1397

1398 **5.2.10 Other threats**

1399 A number of other possible threats were considered and deemed to have unknown impact,  
1400 negligible impact, or no direct effect at the present time (i.e. impact not calculated by the  
1401 IUCN threat calculator). These threats are explored in Appendix A, with the following  
1402 results. Airborne pollutants were thought to have no direct effect at the present time and  
1403 introduced genetic material was thought to have an unknown impact although some  
1404 exchange with mainland herds had occurred. Recreational activities / housing and urban  
1405 areas / utilities and service lines had a negligible impact. Garbage and solid waste / oil and  
1406 gas drilling / war, civil unrest and military exercise did not calculate an impact.  
1407

1408 ***5.3 Knowledge Gaps***

1409 There are knowledge gaps about Dolphin and Union Caribou that need to be addressed to  
1410 assist in management. The key knowledge gaps are listed below.

1411 **High Priority:**

- 1412 1. Population/demography: Demographic information such as pregnancy, survival and  
1413 recruitment rates are all important indicators of population trend that can inform  
1414 management decisions. These data are lacking for Dolphin and Union Caribou.
- 1415 2. Health of caribou, including disease parasites, toxicology and contaminant load. This  
1416 would also include examining transfer of disease through migratory bird droppings

- 1417 and/or insects. Research was conducted in 2015 on caribou health, including disease  
1418 and parasites; the results of this research should be analyzed and reported, and  
1419 monitoring of caribou health should continue.
- 1420 3. Harvest: In order to establish an appropriate harvest rate that allows for a self-  
1421 sustaining population, accurate harvest data is necessary. Harvest reporting is currently  
1422 not mandatory so precise harvest numbers, including sex ratio, are unknown.  
1423 Therefore, accurate harvest data is needed in order to determine appropriate harvest  
1424 rates by local communities.
- 1425 4. Predator-prey relationships: There has been very little research carried out on the  
1426 relationship between Dolphin and Union Caribou and their predators (wolves and  
1427 grizzly bears). Scientific information is lacking on predation rates and how predators  
1428 affect Dolphin and Union Caribou at the population level. It was agreed that further  
1429 research should be carried out on these relationships (First Joint Meeting 2015).
- 1430 5. Potential impact of future development on Dolphin and Union Caribou: Since Dolphin  
1431 and Union Caribou winter in an area of high mineral potential where future mine sites  
1432 and roads may be built, knowledge should be gathered focusing on the impact of these  
1433 potential developments on herd resilience and population trend.
- 1434 **Medium Priority:**
- 1435 6. Vegetation changes and diet: Climate change may impact Dolphin and Union Caribou  
1436 through changes to vegetation including the timing, growth, and types of plants. These  
1437 changes are not well understood. There is also a need for more information on the diet  
1438 of Dolphin and Union Caribou, to better understand these changes.
- 1439 7. Changes to insect population and distribution: Climate change may lead to an increase  
1440 in insect harassment, transfer of disease through insects and potentially the  
1441 establishment of new insect species in Dolphin and Union Caribou range. Research on  
1442 these topics would be helpful for understanding the potential impacts on Dolphin and  
1443 Union Caribou.
- 1444 **Low Priority:**
- 1445 8. Competition: Concerns have been raised about the impacts of muskoxen and over-  
1446 abundant geese on Dolphin and Union Caribou and their habitat. More research  
1447 examining the impacts of these interactions would assist in managing Dolphin and  
1448 Union Caribou.
- 1449 9. Interbreeding: There has been concern expressed over potential interbreeding between  
1450 Dolphin and Union Caribou and other subspecies and populations of caribou. There is  
1451 very little research on the degree of interbreeding (if any) and its possible impacts.  
1452 More knowledge on this topic would benefit Dolphin and Union Caribou.

1453 **6. MANAGEMENT**1454 **6.1 Management Goal**

1455 Recognizing the ecological, cultural and economic importance of Dolphin and Union  
 1456 Caribou, the goal of this management plan is to maintain the long term persistence of a  
 1457 healthy and viable Dolphin and Union Caribou population that moves freely across its  
 1458 current range and provides sustainable harvest opportunities for current and future  
 1459 generations.

1460 **6.2 Management Objectives**

1461 There are five objectives for the management of Dolphin and Union Caribou. These  
 1462 objectives apply broadly across the population's range in both NWT and Nunavut. They are  
 1463 listed in Table 5 in no particular order.

1464

Table 5. Management objectives	
Objective 1	Adaptively co-manage Dolphin and Union Caribou using a community-based approach.
Objective 2	Communicate and exchange information on an ongoing basis between parties using a collaborative and coordinated approach.
Objective 3	Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ and TK, community monitoring and scientific methods.
Objective 4	Minimize disturbance to habitat and preserve sea ice crossings to maintain the ability of Dolphin and Union Caribou to move freely across their range.
Objective 5	Ensure management is based on population level so future generations can benefit from sustainable harvesting opportunities.

1465 **6.3 Approaches to Management of the Dolphin and Union Caribou**

1466 This management plan recommends the approaches discussed below (Table 6) to achieve the management objectives. It  
 1467 provides additional information for each management approach including the relative priority, time frame, threats and/or  
 1468 knowledge gaps addressed, and performance measures and indicators. More specific recommended actions under each  
 1469 approach are provided in Appendix B. All management partners will need to work collaboratively on these approaches, and  
 1470 depending on the partner’s mandate, some could work more closely on specific approach(es) or action(s). Individual  
 1471 community level plans and/or HTO/HTC initiatives can also be carried out to implement these approaches.

1472 Table 6. Approaches to management of the Dolphin and Union Caribou.

Objective	Management Approaches	Threats and/or knowledge gaps addressed	Relative Priority <sup>8</sup> / Time frame <sup>9</sup>	Performance Measures <sup>10</sup>
<b>Objective #1: Adaptively co-manage Dolphin and Union Caribou using a community-based approach.</b>	1.1 Hold regular meetings with co-management partners, Indigenous governments and organizations, and local harvesting committees to make recommendations on Dolphin and Union Caribou management, and to implement these, using co-management processes and adaptive management principles.	Enables adaptive management. <ul style="list-style-type: none"> <li>• Potential to address all threats and provide information on all knowledge gaps</li> </ul>	Critical / Ongoing	<ul style="list-style-type: none"> <li>• Co-management partners share IQ, TK, local and scientific knowledge with each other on an ongoing basis.</li> <li>• All co-management partners review and discuss management practices &amp; recommendations through attending regular meetings.</li> </ul>

<sup>8</sup> **Relative priority** can be *critical, necessary* or *beneficial*. Critical approaches are the highest priority for the conservation of Dolphin and Union Caribou and should be implemented sooner rather than later. Necessary approaches are important to implement for the conservation of Dolphin and Union Caribou but with less urgency than critical. Beneficial approaches help to achieve management goals but are less important to the conservation of the species compared to critical or necessary.

<sup>9</sup> **Relative timeframe** can be short-term, long-term, or ongoing. Short-term approaches should be completed within five years (2023) and long-term approaches require more than five years to complete (2028). Ongoing approaches are long-term actions carried out repeatedly on a systematic basis

<sup>10</sup> **Performance Measures:** This table represents guidance from all partners as to the priority of the approaches and appropriate measure of performance.

Objective	Management Approaches	Threats and/or knowledge gaps addressed	Relative Priority <sup>8</sup> / Time frame <sup>9</sup>	Performance Measures <sup>10</sup>
<p><b>Objective #2:</b>  <b>Communicate and exchange information on an ongoing basis between parties using a collaborative and coordinated approach.</b></p>	<p>2.1 Encourage flow and exchange of information between management partners, communities, industry, regulatory boards, non-governmental organizations (NGOs), and the public, using various approaches to promote better understanding of Dolphin and Union Caribou and the threats they face.</p>	<ul style="list-style-type: none"> <li>• Potential to address all threats and provide information on all knowledge gaps</li> </ul>	<p>Necessary/ Ongoing</p>	<ul style="list-style-type: none"> <li>• Community members such as teachers, elders, and others detect an increased knowledge level by youth regarding traditional hunting practices and overall Dolphin and Union Caribou management.</li> <li>• Knowledge level of industry and regulatory boards increases with respect to Dolphin and Union Caribou management, by considering Dolphin and Union Caribou in project proposals.</li> <li>• Knowledge level of public increases with regard to Dolphin and Union Caribou (possibly via NGO public education).</li> <li>• More communities share harvesting information with one another.</li> <li>• Increase in information collected and information products (e.g., e-mails/pamphlets/presentations) available to managers and communities.</li> </ul>
<p><b>Objective #3:</b>  <b>Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ and TK, community monitoring and scientific methods.</b></p>	<p>3.1 Monitor Dolphin and Union Caribou population number, distribution, and demographic indicators to determine population level and trend.</p>	<p>Enables adaptive management</p> <p><b>Knowledge Gaps:</b></p> <ul style="list-style-type: none"> <li>• Population/demography</li> <li>• Interbreeding</li> </ul>	<p>Critical / Ongoing</p>	<ul style="list-style-type: none"> <li>• Maintain a long term monitoring program for population level, distribution and demographic indicators; trends in population are monitored using IQ, TK, local knowledge and scientific methods.</li> <li>• Increase in monitoring information that is collected.</li> <li>• Increased knowledge with respect to knowledge gaps.</li> </ul>
	<p>3.2 Improve our overall understanding of Dolphin and Union Caribou</p>	<p>Enables adaptive management</p>	<p>Critical / Ongoing</p>	<ul style="list-style-type: none"> <li>• Increase knowledge of how climate change, parasites, diseases, insects, muskoxen/geese competition, and</li> </ul>

Objective	Management Approaches	Threats and/or knowledge gaps addressed	Relative Priority <sup>8</sup> / Time frame <sup>9</sup>	Performance Measures <sup>10</sup>
	health, biology and habitat requirements, diet, and effects of climate change.	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Habitat changes due to climate change</li> <li>• Predation and competition (muskoxen and geese)</li> <li>• Parasites, diseases and insect harassment</li> <li>• Changes to sea ice affecting migration</li> </ul> <p><b>Knowledge Gaps:</b></p> <ul style="list-style-type: none"> <li>• Health of caribou</li> <li>• Vegetation changes and diet</li> <li>• Changes to insect population and distribution</li> <li>• Competition from muskoxen and geese</li> <li>• Interbreeding</li> </ul>		<p>interbreeding impact the Dolphin and Union Caribou population.</p> <ul style="list-style-type: none"> <li>• Increase co-management partner knowledge of these impacts on Dolphin and Union Caribou and of their biology through meetings and information products.</li> </ul>
	3.3 Assess cumulative impacts on Dolphin and Union Caribou population and habitat.	<ul style="list-style-type: none"> <li>• Potential to address all threats and provide information on all knowledge gaps</li> </ul>	Necessary/ Ongoing	<ul style="list-style-type: none"> <li>• Cumulative effects model is developed and used.</li> </ul>
	3.4 Co-ordinate the gathering of information and research among different co-management partners and research institutions.	<ul style="list-style-type: none"> <li>• Potential to address all threats and provide information on all knowledge gaps</li> </ul>	Necessary/ Ongoing	<ul style="list-style-type: none"> <li>• Increase in number of collaborative research projects carried out.</li> <li>• Results shared with co-management partners.</li> <li>• Relevant information compiled.</li> </ul>

Objective	Management Approaches	Threats and/or knowledge gaps addressed	Relative Priority <sup>8</sup> / Time frame <sup>9</sup>	Performance Measures <sup>10</sup>
<p><b>Objective #4:</b>  <b>Minimize disturbance to habitat and preserve sea ice crossings to maintain the ability of Dolphin and Union Caribou to move freely across their range.</b></p>	<p>4.1 Monitor changes to habitat from anthropogenic and natural disturbances on an ongoing basis.</p>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Changes to sea ice affecting migration</li> <li>• Mining</li> <li>• Roads</li> <li>• Predation and Competition (geese and muskoxen)</li> </ul> <p><b>Knowledge Gaps:</b></p> <ul style="list-style-type: none"> <li>• Diet and vegetation changes (climate change)</li> <li>• Competition (geese and muskoxen)</li> </ul>	<p>Critical / Ongoing</p>	<ul style="list-style-type: none"> <li>• Information on changes to habitat (natural &amp; man-made) is collected and shared frequently with co-management partners.</li> </ul>
	<p>4.2 Proactively work with marine/industry/transportation organizations and regulators to minimize human and industrial disturbance and seek ways to preserve sea ice crossings.</p>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Changes to sea ice affecting migration (climate change, shipping, ice-breaking)</li> <li>• Mining</li> <li>• Roads</li> <li>• Flights</li> </ul> <p><b>Knowledge Gaps:</b></p> <ul style="list-style-type: none"> <li>• Diet and vegetation changes (climate change)</li> </ul>	<p>Critical / Ongoing</p>	<ul style="list-style-type: none"> <li>• Potential partners and mechanisms are identified for collaborative work on appropriate actions listed under 4.2, including seeking ways to preserve sea ice crossings.</li> <li>• Guidelines, standard advice and best practices are developed, accepted, and used, including during project reviews.</li> <li>• Dolphin and Union Caribou concerns are brought forward in regulatory processes.</li> <li>• Dolphin and Union Caribou habitat needs are incorporated into land use planning (including terrestrial and marine areas).</li> </ul>
	<p>4.3 Manage populations of other species that affect Dolphin and Union Caribou habitat.</p>	<p><b>Threats:</b></p> <ul style="list-style-type: none"> <li>• Predation &amp; Competition (geese, muskoxen)</li> </ul>	<p>Necessary/ Short Term</p>	<ul style="list-style-type: none"> <li>• Decrease in populations of overabundant species (e.g., geese).</li> <li>• Periodic reports on population level of overabundant species.</li> </ul>

Objective	Management Approaches	Threats and/or knowledge gaps addressed	Relative Priority <sup>8</sup> / Time frame <sup>9</sup>	Performance Measures <sup>10</sup>
		<b>Knowledge Gaps:</b> <ul style="list-style-type: none"> <li>• Competition (geese and muskoxen)</li> </ul>		
<b>Objective #5: Ensure management is based on population level so future generations can benefit from sustainable harvesting opportunities.</b>	5.1 Obtain accurate harvest data.	<b>Threats:</b> <ul style="list-style-type: none"> <li>• Harvesting beyond a sustainable rate</li> </ul> <b>Knowledge Gaps:</b> <ul style="list-style-type: none"> <li>• Population/ demography</li> <li>• Harvest</li> <li>• Health of caribou (disease, toxicology and contaminant load)</li> <li>• Interbreeding</li> </ul>	Critical / Ongoing	<ul style="list-style-type: none"> <li>• Increased awareness among community members of the importance of reporting accurate and complete harvest data.</li> <li>• Accurate harvest data is collected and shared among all co-management partners.</li> <li>• Increased awareness and use of caribou sample kits among harvesters. Basic kits could ask for information on the date/location of harvest, assessment of body condition, measurements of back fat depth, skin, hair and feces collection etc.</li> </ul>
	5.2 Manage harvesting activities within acceptable limits using adaptive management techniques included in Section 6, to ensure that harvesting opportunities are available in the future and treaty rights are fully respected.	<b>Threats:</b> <ul style="list-style-type: none"> <li>• Harvesting beyond a sustainable rate</li> </ul> <b>Knowledge Gaps:</b> <ul style="list-style-type: none"> <li>• Population/ demography</li> <li>• Harvest</li> </ul>	Critical / Ongoing	<ul style="list-style-type: none"> <li>• Refine and adapt Dolphin and Union Caribou harvest management guidance as new information becomes available.</li> <li>• Recommendations on harvest management are put forward to the respective wildlife management boards and territorial Minister for decision and potential implementation.</li> </ul>
	5.3 Manage predators using adaptive management techniques included in Section 6 as a natural and necessary part of the ecosystem. (Note that establishing specific actions of a predator management program, and implementing such a program is beyond the scope of this management plan.)	<b>Threats:</b> <ul style="list-style-type: none"> <li>• Predation and Competition</li> </ul> <b>Knowledge Gaps:</b> <ul style="list-style-type: none"> <li>• Predator/Prey relationships</li> </ul>	Necessary / Ongoing	<ul style="list-style-type: none"> <li>• Development and delivery of hunter education and training takes place that focuses on harvesting of wolves and proper handling of hides.</li> </ul>

## 1473 **6.4 Approaches to Achieve Objectives**

1474 Some of the threats to Dolphin and Union Caribou such as climate change, pollution and  
1475 contaminants are broad in scope and cannot be directly addressed by this management  
1476 plan. Since these range-wide threats are caused by humankind, national and international  
1477 cooperation and collaboration should be promoted to help mitigate them. The impact of  
1478 these threats on Dolphin and Union Caribou should be highlighted through the appropriate  
1479 regional, national and international fora. In addressing these threats, all management  
1480 partners will need to work collaboratively and can choose to work on approaches and  
1481 actions that are most suitable for their particular organisation's mandate.

### 1482 **Objective #1:**

1483 **Adaptively co-manage Dolphin and Union Caribou using a community-based**  
1484 **approach.**

### 1485 **Approaches to achieve Objective #1:**

1486 1.1 Hold regular meetings with co-management partners, Indigenous governments and  
1487 organizations, and local harvesting committees to make recommendations on Dolphin  
1488 and Union Caribou management, and to implement these recommendations using co-  
1489 management processes and adaptive management<sup>11</sup> principles.

1490 The natural environment is always changing; accordingly, threats may change and a  
1491 species' reaction to these threats may also change. Using adaptive management practices  
1492 allows managers to cope with these changes. Regular meetings, rotating among NWT and  
1493 Nunavut communities, would provide a strong foundation for adaptive management. These  
1494 meetings would allow co-management partners to jointly review the most up-to-date  
1495 information on the state of Dolphin and Union Caribou, and the results of new research.  
1496 The management plan will be reviewed at least every five years but more frequent reviews  
1497 and meetings in NWT and Nunavut communities could take place when needed  
1498 (Ekaluktutiak HTO 2016; Olohaktomiut HTC 2016). This would help to work towards a  
1499 management plan that is used and where management actions are adjusted as necessary.  
1500 Regular trans-boundary meetings of the management partners are recommended.  
1501 Continuing to work collaboratively with Inuit and Inuvialuit governments and  
1502 organizations, wildlife management boards, communities, harvesters and industry is  
1503 essential to adapt management practices. Just as IQ, TK and local knowledge form the  
1504 foundation of this management plan, management partners should help ensure this

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<sup>11</sup> Adaptive management is a systematic approach for continually improving management policies or practices by deliberately learning from the outcomes of management actions

1505 knowledge continues to be brought to the decision-making table and guides the  
1506 management of Dolphin and Union Caribou. This is reiterated by Indigenous Peoples since,  
1507 as they point out, they are the main voice for wildlife in the communities (Ekaluktutiak  
1508 HTO 2016; Paulatuk HTC 2016; Olohaktomiut HTC 2016). One harvester mentioned that  
1509 the Dolphin and Union Caribou Management Plan was a good example of collaborative co-  
1510 management (Paulatuk HTC 2016).

1511 **Objective #2:**

1512 **Communicate and exchange information on an ongoing basis between parties using a**  
1513 **collaborative and coordinated approach.**

1514 **Approaches to achieve Objective #2:**

1515 2.1 Encourage flow and exchange of information between management partners,  
1516 communities, industry, regulatory boards, non-governmental organizations (NGOs),  
1517 and the public, using various approaches to promote better understanding of  
1518 Dolphin and Union Caribou and the threats they face.

1519 Nunavut and NWT communities, management partners, elders, hunters, youth, industry  
1520 and the public each have a role to play in management of Dolphin and Union Caribou.  
1521 Exchanging information helps all parties to appreciate their roles and responsibilities and  
1522 helps to build and maintain support for the successful management of Dolphin and Union  
1523 Caribou. It also helps ensure that all perspectives are integrated into management, and that  
1524 caribou managers are aware of on-the-ground matters such as the population and health  
1525 status of the caribou and the state of its habitat.

1526 A variety of methods can be used to communicate information. For example, meetings with  
1527 industry can be held, and within communities, outreach and education can take place  
1528 through various meetings and workshops with co-management partners. Outreach can also  
1529 happen more informally through one-on-one communication between community  
1530 members and staff employed in co-management organizations. Other methods of outreach  
1531 may be used depending on the demographic, such as home visits, school visits, social  
1532 media, and out on the land trips.

1533 These community venues can be used to teach hunters about recognizing disease and  
1534 parasites in caribou, how to determine if meat is edible and how to prepare it accordingly  
1535 (Kugluktuk HTO 2016). To further alleviate concern over diseased caribou and its impacts  
1536 on human health, communities have suggested that harvesters bring back a tissue sample  
1537 to the conservation officer or regional biologist to test for parasites and/or disease when  
1538 anomalies are observed (Ekaluktutiak HTO 2016; Olohaktomiut HTC 2016). The suggestion  
1539 was also made that hunters should take a disease/parasite booklet with them while out on  
1540 the land (Kugluktuk HTO 2016). Other communication links can be built by supporting  
1541 community monitoring programs and by finding ways to work with industry on  
1542 contributing information to research and monitoring.

1543 **Objective #3:**

1544 **Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ**  
 1545 **and TK, community monitoring and scientific methods.**

1546 **Approaches to achieve Objective #3**

1547 3.1 Monitor the Dolphin and Union Caribou population number, distribution, and  
 1548 demographic indicators to determine population level and trend. (Knowledge Gaps #  
 1549 1, 3).

1550 3.2 Improve our overall understanding of Dolphin and Union Caribou health, biology and  
 1551 habitat requirements, diet, and effects of climate change. (Knowledge Gaps # 2, 4, 5).

1552 3.3 Assess cumulative impacts on Dolphin and Union Caribou population and habitat.  
 1553 (Knowledge Gaps # 1-8).

1554 3.4 Co-ordinate the gathering of information and research among different co-  
 1555 management partners and research institutions. (All Knowledge Gaps).

1556 There has been limited information available on the population abundance and trends of  
 1557 Dolphin and Union Caribou, but the development of a research program can provide the  
 1558 foundation to answer the defined knowledge gaps, such as the recent collaring and  
 1559 surveying of the population in Nunavut in 2015. Managers can build on this information  
 1560 through continued monitoring of population size and trend, including important  
 1561 demographic indicators such as pregnancy, survival (particularly females) and calf  
 1562 recruitment rates; this information should be shared with communities (Ekaluktutiak HTO  
 1563 2016). Geographic areas of importance to Dolphin and Union Caribou, including their  
 1564 preferred migratory sea ice routes, would also be identified through this initiative.

1565 At the time of writing this document (2015-2016), research on Dolphin and Union Caribou  
 1566 health including disease, parasites and contaminants is taking place and initial analyses  
 1567 have been completed. Some impacts from climate change include changes in vegetation  
 1568 growth and insect harassment, and research examining these impacts should be promoted.  
 1569 A better understanding of Dolphin and Union Caribou diet is needed to understand these  
 1570 impacts. Expanding community-based monitoring programs that provide information on  
 1571 Dolphin and Union Caribou, such as caribou sampling kits, will also improve knowledge on  
 1572 health, condition, diet, population trends and predators.

1573 Inuit and Inuvialuit have voiced concern that wolf populations appear to be increasing in  
 1574 Dolphin and Union Caribou range, and to some extent grizzly bears (First Joint Meeting  
 1575 2015; Second Joint Meeting 2016). However, there is little scientific information available  
 1576 on predator abundance or how predators impact Dolphin and Union Caribou populations.  
 1577 Management would benefit from an improved understanding of predator abundance and  
 1578 the relationship between Dolphin and Union Caribou and their predators. Dolphin and  
 1579 Union Caribou also interact with other herbivores such as other barren-ground caribou,

1580 muskoxen and geese. A stronger understanding of how these interactions affect Dolphin  
1581 and Union Caribou and their habitat would assist in managing this population.

1582 Threats that may have low or negligible impacts by themselves can have a significant effect  
1583 when they are combined. A cumulative effects model would be a valuable tool to help  
1584 managers understand the relative importance of different pressures on Dolphin and Union  
1585 Caribou and how they ultimately determine the state of the population. Such a model can  
1586 also be used in the co-management process (Objective #1) to help predict the  
1587 consequences of different management scenarios and to develop more effective mitigation  
1588 measures.

1589 Knowledge gaps should be prioritized and addressed by all parties to work toward a  
1590 collaborative and coordinated approach to research and monitoring activities. Some  
1591 questions can be addressed through community-based monitoring and surveys, while  
1592 other research questions can be explored through partnerships with academic researchers  
1593 or other agencies. Documenting IQ, TK and local knowledge on a continuing basis is  
1594 expected and can help to fill knowledge gaps and inform management. Industry may also  
1595 provide a potential source of data for management of Dolphin and Union Caribou. Local  
1596 communities should also be informed and kept up-to-date on the collected data including  
1597 numbers, body condition and overall health (Ekaluktutiak HTO 2016).

1598 **Objective #4:**

1599 **Minimize disturbance to habitat and preserve sea ice crossings to maintain the**  
1600 **ability of Dolphin and Union Caribou to move freely across their range.**

1601 **Approaches to achieve Objective #4**

1602 4.1 Monitor changes to habitat from anthropogenic and natural disturbances on an  
1603 ongoing basis.

1604 4.2 Proactively work with marine/industry/transportation organizations and  
1605 regulators to minimize human and industrial disturbance and seek ways to preserve  
1606 sea ice crossings.

1607 4.3 Manage populations of other species that affect Dolphin and Union Caribou habitat.

1608 Monitoring habitat change, which includes sea ice, will allow management partners to keep  
1609 track of the degree to which Dolphin and Union Caribou habitat has been disturbed, both  
1610 by climate change and more direct industry-based activities including ice-breaking  
1611 activities, shipping and mining exploration. This is a key step in ensuring that Dolphin and  
1612 Union Caribou needs are taken into account by organizations (e.g, Department of Fisheries  
1613 and Oceans, Transport Canada, or the Nunavut Marine Council) in decision-making about  
1614 shipping activities and land use, having due regard for existing, pending and future  
1615 interests in land allowed under territorial land legislation and precedent. A collective

1616 approach with all relevant management partners is required in decision-making about land  
1617 use, including land use planning.

1618 Some communities say that shipping should not be allowed through the Northwest Passage  
1619 from freeze-up to break-up; in other words, during the fall, winter or spring (Ekaluktutiak  
1620 HTO 2016; Second Joint Meeting 2016). Seeking out and collaborating with different  
1621 authorities such as government agencies, community organizations, shipping companies,  
1622 tourism operators and industry will be required in order to minimize disturbance to  
1623 Dolphin and Union Caribou and fragmentation of their habitat. A better understanding  
1624 about authorities that manage ship traffic is needed to inform this collaboration. Some  
1625 communities have expressed concern that industry is not following guidelines or  
1626 respecting important identified caribou habitat (Ekaluktutiak HTO 2016; Kugluktuk HTO  
1627 2016; Olohaktomiut HTC 2016; Paulatuk HTC 2016). As such, guidelines, standard advice  
1628 and best practices related to aircraft, shipping, tourism, and industry should be developed  
1629 including, if necessary, amendments to existing legislation. These should be promoted and  
1630 then followed by monitoring and an evaluation of compliance with these guidelines and  
1631 practices.

1632 Management of other species that may affect Dolphin and Union Caribou, such as  
1633 muskoxen or overabundant geese, requires collaboration with all levels of  
1634 governments. Promoting harvest of overabundant species such as geese may assist in  
1635 reducing habitat destruction.

1636 **Objective #5:**

1637 **Ensure management is based on population level so future generations can benefit**  
1638 **from sustainable harvesting opportunities.**

1639 **Approaches to achieve Objective #5**

1640 5.1 Obtain accurate harvest data.

1641 5.2 Manage harvesting activities within acceptable limits using adaptive management  
1642 techniques included in Section 6, to ensure that harvesting opportunities are  
1643 available in the future and treaty rights are fully respected.

1644 5.3 Manage predators using adaptive management techniques included in Section 6 as a  
1645 natural and necessary part of the ecosystem.

1646 This objective focuses on ensuring a long term harvest of Dolphin and Union Caribou by  
1647 beneficiaries and other harvesters. While carefully considering the limitations on harvest  
1648 data, population level, trend, and demographic indicators (from Objective #3) and harvest  
1649 rate should be considered in determining appropriate harvest management, as outlined in  
1650 Section 6.6. Other management in addition to harvest should also be adaptively informed  
1651 by population level and trend, as described within the approaches under Objective #1 and  
1652 in Section 6.6.

1653 The collection of accurate, complete and reliable harvest data, which includes the number  
1654 of caribou harvested and the sex ratio, is crucial. This can be achieved by proactively  
1655 working with local harvesting committees and other groups to estimate harvest levels of  
1656 Indigenous hunters. This has typically proven to be a difficult task; therefore educating  
1657 communities on the importance of reporting is an essential part of this approach.  
1658 Estimated total harvest levels should be reported annually to caribou management  
1659 authorities, HTOs/HTCs, and co-management partners, as the importance of communities  
1660 remaining informed with respect to new data was highlighted (Ekaluktutiak HTO 2016).  
1661 With this data, an appropriate harvest rate can be determined.

1662 With information on population level and trend, demographic indicators and harvest rate,  
1663 co-management partners can follow the processes outlined for wildlife management in  
1664 land claims. Management partners should annually review harvest information and  
1665 population information, to manage harvesting activities within acceptable limits that allow  
1666 for a viable, self-sustaining caribou population. This approach would use different  
1667 management techniques that correspond to different stages of the caribou population  
1668 cycle, as discussed in further detail in Section 6.6: *Managing based on Population Level*. If it  
1669 appears they are not doing so, then management partners may have to consider  
1670 management recommendations (such as harvesting limits) to achieve the management  
1671 goals.

1672 Responsible harvesting practices that minimize negative impacts on the Dolphin and Union  
1673 population should be promoted to sustain harvest for future generations. This includes  
1674 teaching youth and inexperienced hunters about responsible harvesting practices and good  
1675 marksmanship, since elders are noticing many wounded caribou from young and  
1676 inexperienced hunters (Second Joint Meeting 2016). In this situation, actions should be  
1677 community-based (Ekaluktutiak HTO 2016): by integrating IQ and TK into the school  
1678 system and/or taking youth/inexperienced hunters out on the land, more experienced  
1679 harvesters could assist in teaching them about traditional harvesting practices. Traditional  
1680 practices focus on avoiding harvest of both cows with calves, and the leaders of herds, good  
1681 marksmanship, ability to distinguish types of caribou, and avoiding wastage of meat. Less  
1682 experienced hunters would also benefit from learning about the harvest of prime bulls  
1683 during sport hunts and its negative impacts on the health of the population (Kugluktuk  
1684 HTA 2016). Hunters also suggest to avoid leaving gut piles out on the land to curb the  
1685 attraction of wolves (Olohaktomiut HTC 2016). Promoting harvest of alternative species  
1686 that are available can also provide an option in reducing harvest of Dolphin and Union  
1687 Caribou.

1688 Establishing specific actions of a predator management program, and implementing such a  
1689 program is beyond the scope of this management plan. However, educating and training  
1690 hunters about how to harvest predators can help with managing predators as a natural and  
1691 necessary part of the Dolphin and Union Caribou's ecosystem. At the time of writing this  
1692 plan, Inuit communities in Nunavut may harvest wolves legally with no harvest limits,  
1693 provided they follow the rules of the *Nunavut Wildlife Act*. In NWT, the Inuvialuit may also  
1694 lawfully harvest wolves with no harvest limits or conditions (NWT Summary of Hunting

1695 Regulations 2015), provided that they follow wastage provisions in the *NWT Wildlife Act*.  
 1696 At the first joint meeting in Kugluktuk, it was agreed that further research on predator-  
 1697 prey relationships is needed to inform management (First Joint Meeting 2015).

## 1698 ***6.5 Current Management and Other Positive Influences***

1699 Positive influences on Dolphin and Union Caribou are factors likely to promote population  
 1700 growth. These can be classified into two main categories: 1) management actions that are  
 1701 being implemented; and 2) positive environmental changes (such as an increase in  
 1702 vegetation) that may promote population growth.

### 1703 **Current management**

1704 In the NWT and Nunavut, there are some measures in place that assist in managing Dolphin  
 1705 and Union Caribou, including land claim agreements, legislation, regulations, community  
 1706 conservation plans, and land use planning. The collaborative, responsive co-management  
 1707 regimes set up under land claims have a positive influence on Dolphin and Union Caribou  
 1708 because they allow for concerns to be addressed through adaptive management with  
 1709 participation from all partners.

### 1710 **NWT**

#### 1711 *Co-management regime*

1712 The comprehensive land claim affecting the Western Arctic Region of the Northwest  
 1713 Territories was settled in 1984. The settlement was passed into federal law and is known  
 1714 as the Inuvialuit Final Agreement (IFA). In the NWT portion of the Inuvialuit Settlement  
 1715 Region (ISR), wildlife is managed in accordance with section 14 of the IFA. This section  
 1716 defines the principles of wildlife harvesting and management, identifies harvesting rights,  
 1717 and explains the co-management process and conservation principles. It defines the  
 1718 structure, roles, and responsibilities of the Wildlife Management Advisory Council (NWT)  
 1719 (WMAC (NWT)), governments, the Inuvialuit Game Council (IGC), the Inuvialuit HTC, the  
 1720 Environmental Impact Screening Committee (EISC) and the Environmental Impact Review  
 1721 Board (EIRB). WMAC (NWT) is responsible for listening to concerns raised about wildlife  
 1722 and addressing these concerns through the use of the adaptive management model, which  
 1723 allows management of a species to be adapted according to new circumstances.

#### 1724 *Harvest management*

1725 In the NWT, big game hunting regulations help to manage the harvest of Dolphin and Union  
 1726 Caribou (NWT Summary of Hunting Regulations 2015). There are harvest limits applied to  
 1727 NWT residents, meaning Canadian citizens or landed immigrants who have been living in  
 1728 the NWT for at least a year, but who are not beneficiaries of the IFA. At the time of  
 1729 publication of this document, hunting season for NWT residents runs from August 15<sup>th</sup> to  
 1730 November 15<sup>th</sup> and residents are allowed two bulls. For non-residents and non-Canadians,  
 1731 there is a sport hunting season from August 15<sup>th</sup> to October 31<sup>st</sup> and hunts must be guided;

1732 however there are currently no tags allocated for these hunters, so sport hunting is not  
1733 taking place (WMAC (NWT), pers. comm. 2016). There are presently no restrictions or  
1734 limitations on Indigenous harvest of Dolphin and Union Caribou in the NWT.

#### 1735 *Other conservation plans*

1736 Conservation priorities for the NWT portion of the range have been formalized through  
1737 Inuvialuit Community Conservation Plans. The Olohaktomiut (Ulukhaktok) Community  
1738 Conservation Plan (OCCP, 2008) identifies a number of specific areas important to Dolphin  
1739 and Union Caribou on northwestern Victoria Island and recommends that those “lands and  
1740 waters shall be managed so as to eliminate, to the greatest extent possible, potential  
1741 damage and disruption”. The Plan also recommends other actions that could bring positive  
1742 results for Dolphin and Union Caribou. These include:

- 1743 • Identify and protect important habitats from disruptive land uses.
- 1744 • Share your harvest with others in the community.
- 1745 • Do not harvest more than is needed.
- 1746 • Harvest on sustainable basis, and in a manner consistent with recommendations of  
1747 the HTC.
- 1748 • The HTC will encourage a voluntary ban on caribou hunting where required.
- 1749 • A management plan for Victoria Island Caribou will be developed.

1750 The IFA allows for land use planning (s.7.82), which can be pursued by communities within  
1751 the ISR if desired.

#### 1752 **Nunavut**

##### 1753 *Co-management regime*

1754 In Nunavut, wildlife is managed according to Article 5 of the NLCA. Article 5 sets out the  
1755 creation of the NWMB, which is the primary instrument of wildlife management in  
1756 Nunavut. Article 5 defines the roles of the NWMB, Government, HTOs, and the Regional  
1757 Wildlife Organization (RWO) which is the KRWB in the Kitikmeot Region. In Nunavut, each  
1758 of the co-management partners fulfills its respective role as defined in the NLCA.

##### 1759 *Harvest management*

1760 The *Nunavut Wildlife Act*, an additional management tool, sets out harvest management,  
1761 licensing, reporting and sample submission.

1762 According to the NLCA, Dolphin and Union Caribou are listed under schedule 5-1 as big  
1763 game. Because TAH is not set on this population, Inuit have the right to harvest to the full  
1764 level of their economic, social, and cultural needs. As long as there is no conservation  
1765 concern, Article 5 is constitutionally protected and trumps all other harvesting rules or  
1766 regulations for Inuit.

1767 The GN treats each caribou population, regardless of spatial overlap, separately and  
1768 distinctly for TAH recommendations. Non-beneficiaries, within three months of residency,  
1769 have an open hunting season to legally harvest five caribou per person per year with a valid  
1770 hunting license; however during their first two years as residents of Nunavut, non-  
1771 beneficiaries must hunt with a guide.

1772 In addition, harvest is regulated via a tag system available for sport hunts. The previous  
1773 NWT Big Game regulations (grandfathered into Nunavut legislation when Nunavut was  
1774 established), set a limit of 35 barren-ground caribou sport hunting tags on Victoria Island  
1775 and the Kent Peninsula on the mainland (R-118-98, Dated 14 August, 1998). These tags  
1776 were shared by Kugluktuk and Cambridge Bay. Although the Kugluktuk HTO made a  
1777 motion to suspend all caribou commercial and sport hunts for all herds, sport hunting for  
1778 non-residents (Canadian and non-Canadian) continues to take place in the fall out of  
1779 Cambridge Bay. The main outfitter for sport hunts for Dolphin and Union Caribou is the  
1780 Ekaluktutiak HTO, which allows up to two barren-ground caribou (including Dolphin and  
1781 Union Caribou) per person through an outfitter. There is currently no commercial harvest  
1782 of Dolphin and Union Caribou. No maximum hunting limits on barren-ground caribou exist  
1783 for beneficiaries.

#### 1784 *Other conservation plans*

1785 In the Nunavut portion of the range, the *Nunavut Land Use Plan* is currently under  
1786 development and contains conservation measures for Dolphin and Union Caribou.  
1787 Although the public hearing process is not yet complete and the plan is not finalized, it  
1788 provides recommendations to regulatory authorities to mitigate the impacts of shipping  
1789 traffic on spring and fall caribou sea ice crossings (Nunavut Planning Commission 2016).

1790 Communities, HTOs and government have been working with industry to limit the impacts  
1791 of human activities on Dolphin and Union Caribou. For example, the Cambridge Bay HTO  
1792 made recommendations regarding seasonal restrictions on shipping and at least one  
1793 mining company has made a voluntary commitment to limit shipping to the open water  
1794 season (Ekaluktutiak HTO 2016; Second Joint Meeting 2016). Some mining companies  
1795 have also created flight rules to minimize their impact on caribou.

1796 During the 1940s and 1950s, Inuit tried to reduce geese populations by picking white-  
1797 fronted and snow geese eggs, always ensuring that they left two eggs; if fewer eggs were  
1798 left, the geese would lay even more (First Joint Meeting 2015). This practice is still in  
1799 effect, as families come back each spring with the intent of taking eggs (First Joint Meeting  
1800 2015; Second Joint Meeting 2016).

#### 1801 **Environmental changes**

1802 Warming temperatures in the Arctic are changing the vegetation and presumably changing  
1803 the availability of forage for Dolphin and Union Caribou (see Section 5.2.5). The  
1804 relationships between local conditions (e.g., precipitation, air temperature), forage and

1805 population trend can be complex (e.g., Ozful et al. 2009) and it is unknown to what degree  
1806 any positive effects of climate change may or may not offset the negative effects.  
1807

## 1808 **6.6 Managing Based on Population Level**

1809 Many caribou populations/herds vary naturally in abundance (Zalatan et al. 2006;  
1810 Bergerud et al. 2008; Parlee et al. 2013) and there is still uncertainty about the parameters  
1811 of the Dolphin and Union Caribou cycle. Similar cycles occur in other wildlife and the  
1812 causes of these cycles are not known definitively, but predators, disease, vegetation and  
1813 weather each play a role (Caughley and Gunn 1993, Krebs 2009). The interaction of these  
1814 variables and/or their cumulative impacts may also play a role in population cycles. Based  
1815 on hunters' observations, the last low in the Dolphin and Union Caribou population cycle  
1816 seems to have occurred in the mid-1900s (Nishi and Gunn 2004), and the last high  
1817 occurred around 1997 (Tomaselli et al. 2016a), with a declining trend indicated in the 2015  
1818 population assessment (Leclerc and Boulanger in prep.). The necessary historical data to  
1819 accurately determine the natural range of variation of the Dolphin and Union Caribou may  
1820 be lacking, but there is now sufficient research to determine whether Dolphin and Union  
1821 Caribou have been increasing, stable or decreasing in the last 19 years (see Section 4.4 for  
1822 details).

1823 While developing this management plan, co-management partners discussed how  
1824 management actions should vary depending on where the Dolphin and Union Caribou  
1825 population is in its cycle. As a result, certain management actions are recommended below  
1826 for each population phase. These are intended as advice for decision-makers and a starting  
1827 point for management. Co-management partners would still follow their decision-making  
1828 process as outlined in the NLCA and IFA in order to implement management actions.

### 1829 **6.6.1. Determining population status**

1830 A population cycle can be divided into 4 phases: high, declining, low and increasing (Figure  
1831 9). All co-management partners agreed that the Dolphin and Union Caribou cycle involved  
1832 these four phases. IQ, TK, local knowledge and science were used to define the thresholds  
1833 and to outline parameters that allow co-management partners to determine when the  
1834 population is in each phase of the cycle. Although Figure 9 focuses on population levels,  
1835 other indicators may be considered when establishing the status of Dolphin and Union  
1836 Caribou. These would include demographic indicators, such as number of calves,  
1837 recruitment, survival (particularly females), pregnancy rates, and environmental indicators  
1838 (e.g., climate change, disease, anthropogenic pressure). Climate change will have an  
1839 indirect, but underlying influence on some of these indicators.

#### 1840 **High:**

1841 The population is considered in the high status when it is above 60% of the highest  
1842 recorded population estimates. For Dolphin and Union Caribou, this is considered to be  
1843 above 24,000 as the last population peak of the Dolphin and Union Caribou population was

1844 about 40,000. From the low number of caribou observed by community members in the  
1845 1950s, the corrected 1997 population estimate represented this first scientifically  
1846 measured high for the Dolphin and Union population (Nishi and Gunn 2004). The peak,  
1847 therefore set at 40,000, represents the high end of the confidence interval of the 1997  
1848 population estimate. At this phase, the population migrates in large numbers between  
1849 Victoria Island and the mainland. The population can sustain a greater harvest rate and the  
1850 range is at its maximum.

1851

1852 **Declining:**

1853 The declining phase represents between 20% and 60% of the highest population estimate,  
1854 with a declining trend. It is at the point that the population reaches approximately 24,000  
1855 Dolphin and Union Caribou, that concerns about the population trend should be raised. The  
1856 combination of negative anthropogenic and environmental factors could accelerate the rate  
1857 of decline in the population. Management recommendations to slow down the decrease in  
1858 population should be put forward at this point.

1859

1860 **Low:**

1861 The population is considered to be in the low phase when it is below 20% of the highest  
1862 population estimate, which would represent a population estimate of under 8,000 Dolphin  
1863 and Union Caribou. During this phase, the Dolphin and Union Caribou population is at  
1864 greater risk of overharvesting and its range is greatly contracted to the point where  
1865 migration between Victoria Island and the mainland may stop. Minimizing harvesting and  
1866 human impact on habitat would reduce pressure on this population and could help  
1867 increase the recovery rate of the population.

1868

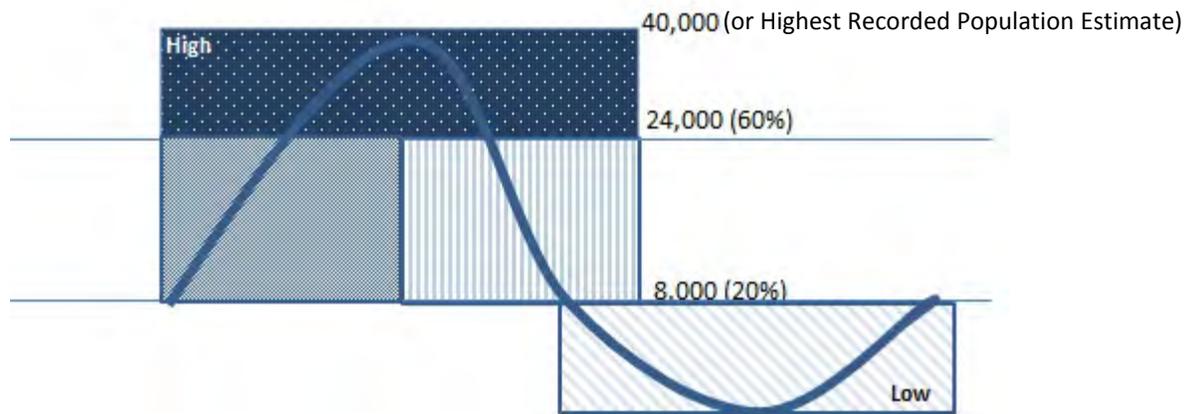
1869 **Increasing:**

1870 The increasing phase would be between 20% and 60% of the highest population estimate  
1871 (between 8,000 and 24,000 caribou) with an increasing trend. Caribou abundance and  
1872 range expands during this phase and the demographic indicators will show a positive  
1873 trend. If Dolphin and Union Caribou have halted their sea ice crossing during the declining  
1874 and low phases, it is during this phase that the migration between Victoria Island and the  
1875 mainland could resume.

1876

1877 As new pertinent information becomes available, it is recommended that co-management  
1878 partners plan a joint meeting to suggest a change from one phase to the next phase (Figure  
1879 9). At a minimum, every 5 years, all the new information should be collected and  
1880 considered to review the population level and trend.

1881



1882

1883 Figure 9. Dolphin and Union Caribou cycles: Determining the location of the Dolphin and  
 1884 Union Caribou population within its cycle. The Dolphin and Caribou population cycle is  
 1885 unpredictable and may vary due to changing magnitude and impact of threats.

1886

1887 **6.6.2. Management actions recommended**

1888 Despite the information gaps with respect to population status, basic management  
 1889 principles can still be applied to maintain a healthy sustainable caribou population. Co-  
 1890 management partners realize the need to use the best available information for managing  
 1891 Dolphin and Union Caribou. The management actions taken, and the point at which they  
 1892 are taken, depend on where the population is in its cycle. Managers should also be mindful  
 1893 of maintaining the population within its natural levels of variation.

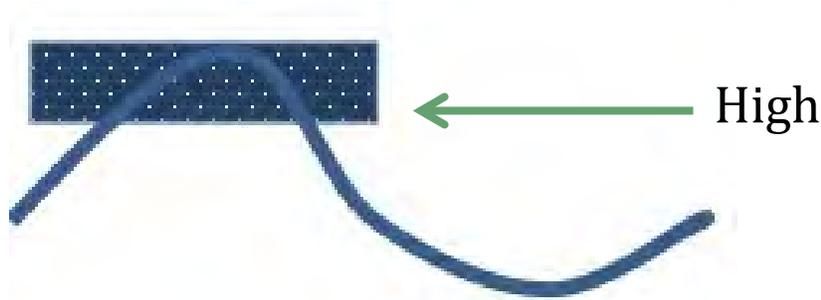
1894 Development of this plan required extensive discussion about management actions. For  
 1895 each phase of the Dolphin and Union Caribou cycle, the co-management partners came to  
 1896 an agreement to recommend certain actions, including harvest management to reflect  
 1897 potential conservation issues. These actions were developed by co-management partners  
 1898 at the Second Joint Meeting (2016) and reviewed and revised through consultation with all  
 1899 the communities, HTOs/HTCs that harvest Dolphin and Union Caribou, and other co-  
 1900 management partners (Ekaluktutiak HTO 2016; Kugluktuk HTO 2016; Olohaktomiut HTC  
 1901 2016; Paulatuk HTC 2016). These actions are described below.

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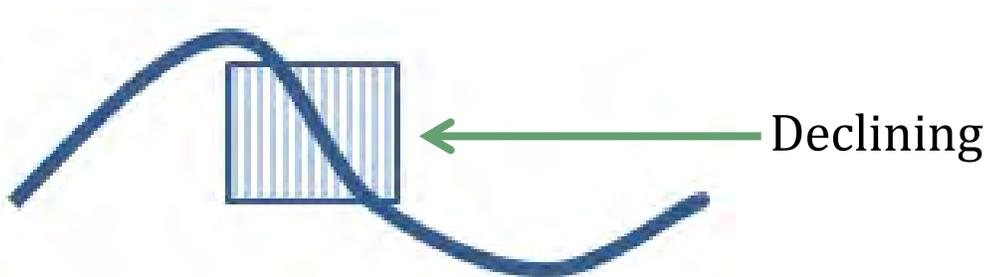
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**High Status:**

- Educate harvesters and youth on how to harvest respectfully and how to harvest alternative species that are available.
- No harvest restrictions on beneficiaries.
- Consider other types of harvests based on community and land claims, including the use of commercial harvest to control over-population.
- Support reporting of harvest and community-based monitoring programs.
- Conduct research and monitoring; have sample kits to monitor harvest.
- Encourage research on predators and ease management of predators.
- Working group of stakeholders meets.
- Industry activities should meet a baseline standard and follow their wildlife monitoring and mitigation plan.



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**Declining status:**

- Educating and integrating information into the school system on topics including: the importance of using the whole caribou, how to hunt alternative wildlife, and harvest of predators.
- No harvest restriction on beneficiaries.
- Consider harvest restriction on non-beneficiaries, such as no resident, outfitter or commercial harvest.
- Consider setting non-quota limitation; e.g., bull-dominated (selecting younger and smaller bulls), limited harvest of females (such as 5% cow harvest), or seasonal limits.
- Support reporting of harvest and community-based monitoring program.

- 1935 • Increase research and monitoring; have sample kits to monitor harvest.
- 1936 • Encourage research on predators, and manage predators as a natural and necessary part of the ecosystem, based on the jurisdiction’s needs.
- 1937
- 1938 • The working group of stakeholders should meet more frequently.
- 1939 • Consider adding more restrictions on industry activities that affect caribou.

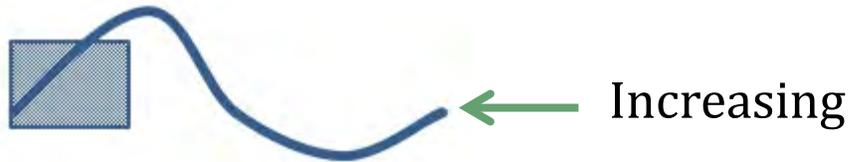
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**Low Status:**

- Educating and integrating information into the school system on topics including: the importance of using the whole caribou, how to hunt alternative wildlife, and harvest of predators.
- Educate people on new restrictions and management that may be in place.
- Consider establishing effective mandatory mechanisms to reduce overall harvest, as appropriate for the community (e.g., TAH). Mechanisms would be reviewed to determine if more reductions are needed.
- Resident, non-resident, outfitter or commercial harvest remain closed.
- Consider removing non-quota limitation; e.g., bull-dominated (selecting younger and smaller bulls), limited harvest of females (such as 5% cow harvest), or seasonal limits.
- Harvest from alternative healthy populations of wildlife available.
- Support reporting of harvest and community-based monitoring program.
- Increase research and monitoring; have sample kits to monitor harvest.
- Encourage research on predators, and manage predators as a natural and necessary part of the ecosystem, based on the jurisdiction’s needs.
- The working group of stakeholders should meet more frequently.
- Consider stricter restrictions for industry activities that affect caribou.



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**Increasing Status:**

- Educate harvesters and youth on how to harvest respectfully and how to harvest alternative species that are available.
- Educate on the restriction and management in place.
- Consider removing the TAH.
- Easing of harvest restrictions and consider implementing non-quota limitation.
- Support report of harvest and community-based monitoring program.
- Conduct research and monitoring; have sample kits to monitor harvest.
- Encourage research on predators and ease management of predators.
- Working group of stakeholders meets.
- Industry activities should meet a baseline standard and follow their wildlife monitoring and mitigation plan.

1981 These recommended management actions respect how Inuit and Inuvialuit have been  
1982 managing wildlife for hundreds of years and take into consideration input and knowledge  
1983 from the community members of each harvesting community. However, co-management  
1984 partners can take action to help the Dolphin and Union Caribou at any time, using their  
1985 powers and responsibilities laid out in land claim agreements (for example, the ability of  
1986 HTOs and HTC's to make by-laws; see Section 2.2). There is a need for increased community  
1987 involvement in the management and regulation of harvest and land use for Dolphin and  
1988 Union Caribou. If communities choose to implement their own restrictions, they are still  
1989 encouraged to discuss these restrictions with other co-management partners.

1990 The recommended management actions are intended as advice for decision-makers.  
1991 Co-management partners would still follow the decision-making processes outlined in  
1992 the NLCA and IFA in order to implement them.

1993

1994 **7. MEASURING PROGRESS**

1995 The performance indicators presented below provide a way to define and measure  
1996 progress toward achieving the management goal (Section 6.1)

- 1997 - The status of Dolphin and Union Caribou has not become threatened or endangered
- 1998 when reassessed by SARC every 10 years, and by COSEWIC every 10 years.
- 1999 - The Dolphin and Union Caribou population allows for continued subsistence
- 2000 harvests.

2001 - Dolphin and Union Caribou move freely throughout their range on Victoria Island and  
2002 the mainland.

2003 In addition to these performance indicators, the performance measures set out in Table 6  
2004 will provide pertinent information to assess interim progress towards achieving the  
2005 ultimate management goal.

2006

## 2007 **8. NEXT STEPS**

2008 Management partners will use this plan to help in assigning priorities and allocating  
2009 resources in order to manage human impacts on Dolphin and Union Caribou. This  
2010 management plan will be reviewed every five years and may be updated. At least every five  
2011 years, there will be a report on the actions undertaken to implement the plan and the  
2012 progress made towards meeting its objectives.

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2432 **APPENDIX A: IUCN THREAT CLASSIFICATION TABLE AND**  
 2433 **THREAT CALCULATOR RESULTS FOR DOLPHIN**  
 2434 **AND UNION CARIBOU**

2435 The threats classification is based on the IUCN – Conservation Measures Partnership  
 2436 unified threats classification system. These international standards for describing threats  
 2437 were utilized in order to provide consistency between different species, and improve data  
 2438 sharing and coordination among species at risk and other related wildlife programs. To  
 2439 reduce duplication of effort, GC and COSEWIC collaborated in organizing the completion of  
 2440 the threats calculator as it is required for both the management plan and the upcoming  
 2441 COSEWIC status assessment of Dolphin and Union Caribou. Co-management partners,  
 2442 scientific experts and representatives from the six HTOs/HTCs within the range of Peary  
 2443 caribou were invited to attend a teleconference to fill out the threats calculator. A training  
 2444 session for HTO and HTC representatives was held beforehand, and a teleconference in  
 2445 December 2014 as well as February 2016 were held to evaluate the threats. The  
 2446 teleconferences were attended by:

- 2447 • Joseph Oliktoak (Olohaktomiut HTC - Ulukhaktok)
- 2448 • Joeseeph Illasiak and Diane Ruben (Paulatuk HTC)
- 2449 • David Nivingaluk and Kevin Klengenberg (Kugluktuk HTO)
- 2450 • Jimmy Haniliak, Howard Greenley and George Angohiatok (Ekaluktutiak HTO –  
 2451 Cambridge Bay)
- 2452 • Ema Qaggutaq (KRWB)
- 2453 • Tracy Davison, Lisa Worthington Suzanne Carriere and Nic Larter (GNWT)
- 2454 • Lisa-Marie Leclerc and Melanie Wilson (GN)
- 2455 • Justina Ray (COSEWIC Terrestrial Mammals Specialist Subcommittee Co-chair)
- 2456 • Dave Fraser (COSEWIC, Government of British Columbia)
- 2457 • Donna Hurlburt (COSEWIC Indigenous Traditional Knowledge Subcommittee Co-chair)
- 2458 • Lee Harding (Report writer for COSEWIC)
- 2459 • Kim Poole (Aurora Wildlife Research)
- 2460 • Lisa Pirie, Donna Bigelow, Dawn Andrews, Amy Ganton and Isabelle Duclos (GC)
- 2461 • Peter Sinkins (Parks Canada Agency)

2462 Participants calculated an overall threat impact of Very High to High for Dolphin and Union  
 2463 Caribou. Threats were ranked in terms of scope, severity and timing, and the rankings  
 2464 were automatically rolled up into an impact for each threat as well as an overall impact.

2465 **Impact** of the threat on Dolphin and Union Caribou is calculated based on scope and  
 2466 severity. Categories include: very high, high, medium, low, unknown, negligible.

2467  
 2468 **Scope** is the proportion of the population that can reasonably be expected to be affected by  
 2469 the threat within the next 10 years. Categories include: Pervasive (71-100%); Large (31-  
 2470 70%); Restricted (11-30%); Small (1-10%); Negligible (<1%), Unknown. Categories can

2471 also be combined (e.g., Large-Restricted = 11-70%).

2472

2473 **Severity** is, within the scope, the level of damage to the species (assessed as the % decline  
2474 expected over the next three generations [7 years = 1 generation for Dolphin and Union  
2475 Caribou]) due to threats that will occur in the next 10 years. Categories include: Extreme  
2476 (71-100%); Serious (31-70%); Moderate (11-30%); Slight (1-10%); Negligible (<1%),  
2477 Unknown. Categories can also be combined (e.g., Moderate to slight = 1-30%).

2478

2479 **Timing** describes the immediacy of the threat. Categories include: High (continuing);  
2480 Moderate (possibly in the short term [<10 years or three generations]); Low (possibly in  
2481 the long term [>10 years or three generations]); Negligible (past or no direct effect);  
2482 Unknown.

2483

Species:	Dolphin & Union Caribou (DU2)
Date:	Meeting #1: 12/08/2014; Meeting #2: 08/02/2016
Assessor(s):	<p><u>Meeting #1:</u> Justina Ray (COSEWIC), Dave Fraser (COSEWIC, BC), Suzanne Carriere (COSEWIC, NWT), Nic Larter (COSEWIC, NWT), Donna Hurlburt (COSEWIC, Aboriginal Traditional Knowledge (ATK)), Lee Harding (report writer), Tracy Davison (GNWT), Lisa Worthington (GNWT), Lisa-Marie Leclerc (GN), Melanie Wilson (GN), Donna Bigelow (GC), Dawn Andrews (GC), Lisa Pirie (GC), Kim Poole (Aurora Wildlife Research), David Nivingalok (Kugluktuk HTO), Kevin Klengenber (Kugluktuk HTO), Ema Qaggutaq (KRWB), Joseph Oliktoak (Olohaktomiut HTC)</p> <p><u>Meeting #2:</u> Justina Ray (COSEWIC), David Fraser (COSEWIC), Lisa-Marie Leclerc (GN), Ema Qaggutaq (KRWB), Amy Ganton (GC), Isabelle Duclos (GC), Peter Sinkins (Parks Canada Agency), Jimmy Haniliak (Ekaluktutiak HTO), Howard Greenley (Ekaluktutiak HTO), George Angohiatok (Ekaluktutiak HTO), Joshua Oliktoak (Olohaktomiut HTC), Myles Lamont (GN), Diane Ruben (Paulatuk HTC), Joe Illasiak (Paulatuk HTC).</p>

484

**Overall Threat Impact Calculation Help:**

Threat Impact		Level 1 Threat Impact Counts	
		high range	low range
A	Very High	0	0
B	High	2	1
C	Medium	2	0
D	Low	1	4
Calculated Overall Threat Impact:		Very High	High

<b>Assigned Overall Threat Impact:</b>	AC = Very High - High
<b>Overall Threat Comments:</b>	Two threat calculator meetings were held (8/12/2014 and 8/2/2016), and results were combined

485

Threat		Impact (calculated)		Scope (next 10 Yrs)	Severity (10 Yrs or 3 Gen.)	Timing	Comments
1	<a href="#">Residential &amp; commercial development</a>		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. There is the possibility that municipal boundaries may increase in the coming years, but this still makes the scope very low. Although very few D&U animals are or will be exposed to this threat, any that come within a certain distance of human settlements will very likely be killed, hence the high severity.
3	<a href="#">Energy production &amp; mining</a>	D	Low	Restricted (11-30%)	Slight (1-10%)		
3.1	Oil & gas drilling		Not Calculated (outside assessment timeframe)			Insignificant/ Negligible (Past or no direct effect)	No seismic activity or O&G development at present, and not expected in the foreseeable future within the D&U range
3.2	Mining & quarrying	D	Low	Restricted (11-30%)	Slight (1-10%)	High (Continuing)	The scope is currently very low, but it is plausible for this to increase with a higher percentage of the population being directly affected by mines themselves within the next 10 years. This does not include shipping, flights, or roads associated with mines, which are counted elsewhere here. Most direct mortality from the mines themselves will be very low.
4	<a href="#">Transportation &amp; service corridors</a>	B	High	Pervasive - Large (31-100%)	Serious (31-70%)	Moderate (Possibly in the short term, < 10 yrs)	
4.1	Roads & railroads	D	Low	Restricted (11-30%)	Slight (1-10%)	Moderate (Possibly in the short term, < 10 yrs)	Currently the scope is negligible but if MMG/Izok Corridor proceeds with its project for a mine with an all-weather road from the coast 325 km inland, (or a similar one, e.g., within the Hope Bay greenstone belt) the impact of roads would greatly increase. It is possible that other development will happen in next 10 years. It is not believed that this project would include a network of winter roads coming off the all-

Threat		Impact (calculated)		Scope (next 10 Yrs)	Severity (10 Yrs or 3 Gen.)	Timing	Comments
							weather road. Even one road, depending on where it is situated, could be encountered by a large proportion of the population. The direct impact of that road (mortality) will still be low, even if indirect effects are high
4.2	Utility & service lines		Negligible	Negligible (<1%)	Negligible (<1%)	Unknown	
4.3	Shipping lanes	B	High	Pervasive - Large (31-100%)	Serious (31-70%)	High (Continuing)	Category includes both open water and ice-breaker shipping. Open water shipping (which currently occurs) is not an issue, rather impact is entirely from winter shipping that involves any ice breaking (including relatively thin ice that does not qualify as ice breaking by Transport Canada definitions). Currently most activity is local ice-breaking activity early season around Cambridge Bay, but occasional ships are passing through so this threat is already occurring. The current proposal for shipping out of the bottom of Bathurst inlet could affect half the D-U population. Impact of shipping depends on timing. Caribou can start crossing as early as October 15 and into December. 2-3 boats during migration could entirely stop migration and cause 40% of the animals to drown. On the other hand, the whole population doesn't cross at same time and ice can refreeze between crossings. Not every icebreaking event will cause massive fatalities.
4.4	Flight paths	D	Low	Restricted (11-30%)	Slight (1-10%)	High (Continuing)	Category is for regularly scheduled flights, i.e., to mines. The possibility of scheduled flights increasing significantly, especially when/if proposed projects start operating. Large planes to mines could be more than flights to communities. On the other hand, flights are mostly high, and only go only low for landing. Modelling work has shown relatively low direct impact. Severity is likely at the low end of slight (1-10%) range. If flight paths were to change to impact calving, the severity would increase.
5	<a href="#">Biological resource use</a>	CD	Medium - Low	Pervasive (71-100%)	Moderate - Slight (1-30%)	High (Continuing)	

Threat		Impact (calculated)		Scope (next 10 Yrs)	Severity (10 Yrs or 3 Gen.)	Timing	Comments
5.1	Hunting & collecting terrestrial animals	CD	Medium - Low	Pervasive (71-100%)	Moderate - Slight (1-30%)	High (Continuing)	Harvesting of Dolphin-Union caribou is unregulated. There is no hunting season or limit. Harvest levels change depending on location of caribou in a given year, and availability of other harvested species. 3 communities harvest Dolphin-Union caribou: Ulukhaktok (harvest in summer), Cambridge Bay (harvest in fall), and Kugluktuk (harvest in winter and spring when they come across the ice). There may be a shift in harvest from mainland caribou, which are in steep decline. D&U population has declined since the last surveys, but has also changed its distribution such that animals are not so accessible to these communities anymore. This will decrease harvest. Very large range of uncertainty in severity due to unknown harvest levels and uncertainty of population numbers in the future. Score for severity encompasses both worst and best case scenarios. Also, a change in distribution may expose animals to harvest elsewhere.
6	<a href="#">Human intrusions &amp; disturbance</a>		Negligible	Restricted (11-30%)	Negligible (<1%)	High (Continuing)	
6.1	Recreational activities		Negligible	Negligible (<1%)	Negligible (<1%)	High (Continuing)	
6.2	War, civil unrest & military exercises		Not Calculated (outside assessment timeframe)			Insignificant/ Negligible (Past or no direct effect)	Military exercises not a threat in this region; no seasonal overlap with D&U caribou
6.3	Work & other activities		Negligible	Restricted (11-30%)	Negligible (<1%)	High (Continuing)	Includes (primarily) research activities (e.g., surveys and capture/collaring)
8	<a href="#">Invasive &amp; other problematic species &amp; genes</a>	BD	High - Low	Pervasive (71-100%)	Serious - Slight (1-70%)	High (Continuing)	
8.1	Invasive non-native/alien species	CD	Medium - Low	Large - Restricted (11-70%)	Moderate (11-30%)	High (Continuing)	This category includes all diseases and pathogens (both native and non native). Climate change expected to increase parasites and disease. Parasites increasing and expected to increase further. Lungworm increasing in muskox, but not necessarily fatal. We do have to include that we seeing evidence that there is potential for more to occur. Biting flies are also an issue.

Threat		Impact (calculated)		Scope (next 10 Yrs)	Severity (10 Yrs or 3 Gen.)	Timing	Comments
8.2	Problematic native species	BD	High - Low	Pervasive (71-100%)	Serious - Slight (1-70%)	High (Continuing)	This category includes all predator/competitor interactions (both native and non-native). Grizzly bears have moved into Victoria Island in the last decade or so can have an impact on numbers. Wolves have increased on Victoria Island. Given the multi-prey interactions, predators like wolves have potential to wipe out caribou when muskox numbers are high. Impact is greater with a small population, and less when they have the opportunity to escape the predators. Severity and Scope could be high during the fall migration while they are waiting for the sea ice to form, but there is enormous uncertainty.
8.3	Introduced genetic material		Unknown	Large - Small (1-70%)	Unknown	High (Continuing)	Interbreeding with Barren-ground and Peary caribou. Although there are some claims that D&U is a hybrid ( <i>Rangifer groenlandicus</i> x <i>pearyi</i> ), this is not accurate. Genetics work over past decade shows Dolphin-Union as a genetically distinct population with a very small amount of Peary intergradation. A significant number of individuals would need to be inter-breeding to impact population. Communities have seen Peary caribou traveling with D&U, Barrenground traveling with D&U (more rare). Chances of hybridization are low due to the separation of the rutting grounds. Likely on the low end of both the scope and severity ranges, although the higher degree of uncertainty on severity reflects our lack of knowledge on the impacts of interbreeding. Really, particularly considering ATK, the impacts are unknown.
9	<a href="#">Pollution</a>						
9.4	Garbage & solid waste						Contaminants are not currently regarded as a threat, given successful clean-up of the Dew Line.
11	<a href="#">Climate change &amp; severe weather</a>	CD	Medium - Low	Pervasive (71-100%)	Moderate - Slight (1-30%)	High (Continuing)	
11.1	Habitat shifting & alteration	CD	Medium - Low	Pervasive (71-100%)	Moderate - Slight (1-30%)	High (Continuing)	Category includes changes to habitat (vegetation and ice) conditions due to climate change over the next decade. Scope will affect entire population. With respect to severity, there is and will be much variability (i.e., positive and negative effect). Could get a trophic shift where there is a mismatch of greening and caribou life cycle, which could affect calving and calf survival. There is also a possibility that forage could increase with climate change. In either case, severity is

Threat		Impact (calculated)		Scope (next 10 Yrs)	Severity (10 Yrs or 3 Gen.)	Timing	Comments
							not likely to be very severe. Could get a bad year or two, but will recover unless hits every year repeatedly, which is unlikely. With respect to ice, there is a small core area for Dolphin-Union, so ice conditions aren't as big a threat as they were to Peary Caribou.
11.4	Storms & flooding	CD	Medium - Low	Large (31-70%)	Moderate - Slight (1-30%)	Moderate (Possibly in the short term, < 10 yrs)	Icing events (storms) not as big an issue for Dolphin-Union as it is for Peary, and is currently unknown for D&U. Scope: Because winter range is a small area, one storm event could impact a large portion of the population. Over 3 generations, expect to be able to recover from a weather event, unless happens repeatedly year after year. Less likely to have bad weather events for multiple years in a row, which would knock back the population without a chance for recovery.

2486 Of the threats explored in Section 5.2, a number of issues were not assessed by the threat  
2487 assessment group, or were unknown / negligible / impact not calculated. Information  
2488 about these threats is provided below.

2489 *IUCN Threat #9.5 Air-borne Pollutants (impact not discussed by IUCN panel but discussed at*  
2490 *Kugluktuk and Cambridge Bay joint Dolphin and Union Caribou meetings)*

2491 Contaminants produced in other parts of the world are carried up to the Arctic by global air  
2492 currents and can enter Dolphin and Union Caribou through their food (Gamberg 2016).  
2493 Sampling in 1993 and 2006 found relatively low levels of organochlorine, heavy metal and  
2494 radio nuclide contaminants in Dolphin and Union Caribou, although Dolphin and Union  
2495 Caribou had higher mercury levels compared to the Porcupine herd of barren-ground  
2496 caribou (Macdonald et al. 1996; Gamberg 2008, 2016). Some Indigenous Peoples  
2497 expressed concern over potential contamination and pollution from mining sites that could  
2498 affect caribou and other wildlife (Ekaluktutiak HTO 2016). Contaminants do not appear to  
2499 be current threats to Dolphin and Union Caribou health (SARC 2013), but some community  
2500 members voiced concern over potential future contaminants, particularly if the levels and  
2501 types of contaminants grow (First Joint Meeting 2015; Second Joint Meeting 2016).  
2502 Therefore, continued monitoring is important since contaminants can change as 'new'  
2503 chemicals become more common, such as brominated flame retardants (PBDEs) and  
2504 fluorinated compounds (Gamberg 2016).

2505 *IUCN Threat #8.3 Introduced Genetic Material (Unknown Impact)*

2506 The impact of Dolphin and Union Caribou interbreeding with other types of caribou is  
2507 unknown. Some communities have observed Dolphin and Union Caribou travelling with  
2508 Peary caribou, and Kugluktuk hunters have observed Dolphin and Union Caribou travelling  
2509 with barren-ground caribou. Some elders report that interbreeding is occurring between  
2510 Peary caribou and barren-ground caribou and that Dolphin and Union Caribou are actually  
2511 the result of this interbreeding (Ekaluktutiak HTO 2016). More research is needed to  
2512 understand the impacts of interbreeding for Dolphin and Union Caribou, and the  
2513 implications it may have for the population.

2514 *IUCN Threat #6.1 Recreational Activities (Negligible Impact)*

2515 Concerns have been voiced over the potential impacts of tourism activities including  
2516 individuals disembarking from boats or vehicles and tourists walking on caribou grounds  
2517 (First Joint Meeting 2015; Second Joint Meeting 2016). These tourism activities usually  
2518 take place during the summer months when caribou are widely dispersed on Victoria  
2519 Island.

2520 *IUCN Threat #1.1 Housing and Urban Areas (Negligible Impact)*

2521 Human settlements are a threat because caribou that travel near human settlements are at  
2522 more risk of being harvested. However, human settlements are considered to have a  
2523 negligible impact because relatively few Dolphin and Union Caribou are exposed to these  
2524 settlements across their range.

2525 *IUCN Threat #4.2 Utility and Service Lines (Negligible Impact)*

2526 Utilities and service lines currently have a negligible impact on Dolphin and Union Caribou,  
2527 as there are very few utility and service lines in this population's range.

2528 *IUCN Threat #9.4 Garbage and Solid Waste (Impact Not Calculated)*

2529 With the successful clean-up of the DEW (Detection Early Warning) Line, garbage and solid  
2530 waste was not regarded as a threat to Dolphin and Union Caribou when the threat  
2531 classification table was completed. However, one community expressed concerns that  
2532 garbage and solid waste should not be restricted to DEW Line sites as garbage was  
2533 observed coming from the sea (Kugluktuk HTO 2016).

2534 *IUCN Threat #3.1 Oil and Gas Drilling (Impact Not Calculated)*

2535 According to one community member, in the 1970s and 1980s oil and gas exploration  
2536 caused caribou to avoid their area by moving 100 miles away from all the noise (First Joint  
2537 Meeting 2015). However, there is currently no oil and gas development or seismic activity  
2538 occurring in the range of Dolphin and Union Caribou, and these activities are not expected  
2539 within the foreseeable future.

2540 *IUCN Threat #6.2 War, Civil Unrest, and Military Exercises (Impact Not Calculated)*

2541 The time of year that military exercises occur does not overlap temporally or spatially with  
2542 caribou in the area. However some community members have voiced concern over DEW-  
2543 lines in this region disturbing the migration route of Dolphin and Union Caribou  
2544 (Olohaktomiut HTC 2016). Despite these concerns, military exercises overall were not  
2545 seen as a threat to Dolphin and Union Caribou when the threat classification table was  
2546 completed.

2547

2548

2549 **APPENDIX B: DOLPHIN AND UNION CARIBOU MANAGEMENT**  
2550 **FRAMEWORK**

2551  
2552  
2553 **Outline of goal, objectives, approaches and actions**  
2554 **Based on Group Discussions in Kugluktuk: March 25 – 27, 2015; and**  
2555 **Cambridge Bay: January 11 – 13, 2016**

2556  
2557  
2558 **MANAGEMENT GOAL/VISION:**

2559 Recognizing the ecological, cultural and economic importance of Dolphin and Union  
2560 Caribou, the goal of this management plan is to maintain the long term persistence of a  
2561 healthy and viable Dolphin and Union Caribou population that moves freely across its  
2562 current range and provides sustainable harvest opportunities for current and future  
2563 generations.

2564  
2565 **OBJECTIVES:**

2566 These are five objectives for the management of Dolphin and Union Caribou. These  
2567 objectives apply broadly across the population's range in both NWT and Nunavut.

- 2568
- 2569 1. Adaptively co-manage Dolphin and Union Caribou using a community-based  
2570 approach.
  - 2571
  - 2572 2. Communicate and exchange information on an ongoing basis between parties using  
2573 a collaborative and coordinated approach.
  - 2574
  - 2575 3. Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ  
2576 and TK, community monitoring and scientific methods.
  - 2577
  - 2578 4. Minimize disturbance to habitat and preserve sea ice crossings to maintain the  
2579 ability of Dolphin and Union Caribou to move freely across their range.
  - 2580
  - 2581 5. Ensure management is based on population level so future generations can benefit  
2582 from sustainable harvesting opportunities.
  - 2583

2584  
2585 **APPROACHES AND ACTIONS TO ACHIEVE THESE OBJECTIVES:**

2586 Recommended approaches (numbered as X.X.) are grouped on the following pages under  
2587 each objective. More specific actions (numbered as X.X.X) are grouped below under each  
2588 approach.

2589  
2590

2591 **Objective #1:**  
2592 **Adaptively co-manage Dolphin and Union Caribou using a community-based**  
2593 **approach.**

- 2594 1.1 Hold regular meetings with co-management partners, Indigenous governments  
2595 and organizations, and local harvesting committees to make recommendations on  
2596 Dolphin and Union Caribou management, and to implement these, using co-  
2597 management processes and adaptive management principles.
- 2598 1.1.1 Incorporate local knowledge, IQ and TK and ensure that plans and actions  
2599 for Dolphin and Union Caribou management are informed by this  
2600 knowledge.
- 2601 1.1.2 Continue to work with wildlife management advisory boards, game  
2602 councils and local HTO/HTCs on Dolphin and Union Caribou monitoring,  
2603 stewardship and management.
- 2604 1.1.3 Work with industry on best practices, mitigation, and research.
- 2605 1.1.4 Collaborate with industry and other partners on monitoring so that  
2606 information can be combined at a large spatial scale to give a big picture  
2607 view.
- 2608 1.1.5 Continue engaging hunters, industry and public about Dolphin and Union  
2609 Caribou management.
- 2610 1.1.6 Annually review new information on population status and habitat, and  
2611 adapt management practices accordingly.
- 2612 1.1.7 Conduct regular trans-boundary meetings of Dolphin and Union Caribou  
2613 co-management partners, rotating among NWT and Nunavut communities,  
2614 to review information and population level and trend and discuss  
2615 management.
- 2616 1.1.8 If necessary, recommend alternative management actions (e.g., stricter  
2617 habitat and/or harvest management) allowing for natural variation in  
2618 numbers.
- 2619 1.1.9 Every five years, report on management actions and progress made toward  
2620 meeting objectives in management plan.

2621  
2622 **Objective #2:**  
2623 **Communicate and exchange information on an ongoing basis between parties using a**  
2624 **collaborative and coordinated approach.**

- 2625 2.1 Encourage flow and exchange of information between management partners,  
2626 communities, industry, regulatory boards, non-governmental organizations  
2627 (NGOs), and the public, using various approaches to promote better understanding  
2628 of Dolphin and Union Caribou and the threats they face.
- 2629 2.1.1 Conduct out on the land trips, where experienced hunters (elders if they're  
2630 able) take youth out on the land.
- 2631 2.1.2 Use social media and the internet to reach out to youth.
- 2632 2.1.3 Conduct school visits (possibly elders if they're able) to educate youth  
2633 about managing Dolphin and Union Caribou.

- 2634 2.1.4 Conduct community meetings to exchange information with communities  
 2635 about management of Dolphin and Union Caribou.  
 2636 2.1.5 Investigate possible mechanisms to foster industry participation in  
 2637 research and monitoring.  
 2638 2.1.6 Ensure ongoing communication through supporting and improving  
 2639 community monitoring programs.  
 2640

2641 **Objective #3:**

2642 **Collect information to fill knowledge gaps on Dolphin and Union Caribou using IQ**  
 2643 **and TK, community monitoring and scientific methods.**

- 2644 3.1 Monitor Dolphin and Union Caribou population number, distribution and  
 2645 demographic indicators to determine population level and trend.  
 2646 3.1.1 Expand community monitoring programs that provide information on  
 2647 Dolphin and Union Caribou condition, population size and trends,  
 2648 predators, changes in distribution, and timing of seasonal movements.  
 2649 3.1.2 Develop and implement both a short and long term monitoring schedule, to  
 2650 monitor demographic indicators such as pregnancy, survival and  
 2651 recruitment rates.  
 2652 3.1.3 Develop and implement a schedule to assess population status every five  
 2653 years, based on the framework in Section 6.6.  
 2654 3.1.4 As technologies and research methods evolve, continue investigating  
 2655 alternative, effective methods to obtain population information.  
 2656  
 2657 3.2 Improve our overall understanding of Dolphin and Union Caribou health, biology  
 2658 and habitat requirements, diet, and effects of climate change.  
 2659 3.2.1 Identify geographic areas of importance to Dolphin and Union Caribou  
 2660 through research and community/TK.  
 2661 3.2.2 Monitor changes in predator abundance.  
 2662 3.2.3 Promote research on relationships between Dolphin and Union Caribou  
 2663 and predators (including relatively new predators such as the grizzly bear  
 2664 on Victoria Island).  
 2665 3.2.4 Promote research on relationships between Dolphin and Union Caribou  
 2666 and other species (e.g., other ungulates, geese).  
 2667 3.2.5 Promote and/or continue research on Dolphin and Union Caribou  
 2668 population, habitat, vital rates, and health and condition, including possible  
 2669 contaminants.  
 2670 3.2.6 Promote research on Dolphin and Union Caribou diet and vegetation  
 2671 growth, including changes as a result of climate change.  
 2672 3.2.7 Promote research on insects and insect harassment, particularly as it  
 2673 relates to climate change.  
 2674 3.2.8 Promote research on feasibility of alternative tools for population growth  
 2675 (e.g., translocation, domestication).  
 2676 3.2.9 Promote research of the impacts of climate change on Dolphin and Union  
 2677 Caribou habitat and population.

- 2678 3.2.10 Promote research on examining the impacts of road versus flight  
 2679 transportation on caribou.  
 2680
- 2681 3.3 Assess cumulative impacts on Dolphin and Union Caribou population and habitat.  
 2682 3.3.1 Develop an approach to modelling cumulative effects to help predict the  
 2683 consequences of different **anthropogenic** impacts and to develop more  
 2684 effective mitigation measures.  
 2685
- 2686 3.4 Co-ordinate the gathering of information and research among different co-  
 2687 management partners and research institutions.  
 2688 3.4.1 Identify knowledge gaps and establish high priority research questions.  
 2689 3.4.2 Co-ordinate research activities with different research institutions and  
 2690 promote high priority research.  
 2691 3.4.3 Ensure local involvement in research activities (planning, field research).  
 2692 3.4.4. Promote national and international cooperation and collaboration to  
 2693 mitigate range-wide threats in Canada, such as climate change, pollution  
 2694 and contaminants.  
 2695

2696 **Objective #4:**

2697 **Minimize disturbance to habitat and preserve sea ice crossings to maintain the**  
 2698 **ability of Dolphin and Union Caribou to move freely across their range.**  
 2699

- 2700 4.1 Monitor changes to habitat from anthropogenic and natural disturbances on an  
 2701 ongoing basis.  
 2702 4.1.1 Track human and industry-caused landscape changes.  
 2703 4.1.2 Monitor industrial and tourism activity including shipping traffic.  
 2704 4.1.3 Track changes to sea ice and potential impacts to Dolphin and Union  
 2705 Caribou.  
 2706
- 2707 4.2 Proactively work with marine/industry/transportation organizations and  
 2708 regulators to minimize human and industrial disturbance and seek ways to  
 2709 preserve sea ice crossings.  
 2710 4.2.1 Investigate mechanisms and authorities that manage shipping traffic within  
 2711 federal government and industry (e.g., Transport Canada) to discuss and  
 2712 move forward shipping concerns (e.g., amending legislation, establishing  
 2713 regulations including seasonal limitations for industry shipping and cruise  
 2714 ships during migration season, and adjusting these in response to caribou  
 2715 level and trend, if necessary).  
 2716 4.2.2 Collaborate with federal government departments (e.g., Department of  
 2717 Fisheries and Oceans) to examine the potential role that marine protected  
 2718 areas could play in protecting the sea ice component of the migration route.  
 2719 4.2.3 Develop guidelines, regulations, standard advice, and best practices for  
 2720 shipping, tourism and industry (including flights) that can be regulated and  
 2721 evaluated.

- 2722 4.2.4 Monitor and evaluate compliance with (or implementation of) regulations,  
2723 guidelines standard advice, and best practices mentioned in 4.2.3.
- 2724 4.2.5 Identify organizations (e.g., HTOs, NWMB, Nunavut Marine Council, and  
2725 communities) who could/would play a lead role in promoting standard  
2726 advice and guidelines for shipping, tourism and industry.
- 2727 4.2.6 Ensure important areas for Dolphin and Union Caribou (including sea ice  
2728 crossings) are brought forward in the Nunavut land-use planning process.
- 2729 4.2.7 For lands in the NWT that overlap with the NWT-portion of the Dolphin  
2730 and Union Caribou range, explore how a land use planning process under  
2731 the IFA (s.7.82) might be used to provide greater certainty to land  
2732 management while maintaining habitat for the population.
- 2733 4.2.8 Bring forward Dolphin and Union Caribou concerns through Interventions  
2734 in Nunavut Environmental Impact Review Board and NWT's EIRB  
2735 processes.
- 2736 4.2.9 Work with industry, researchers, regulators, governments, HTOs/HTCs and  
2737 communities to minimize aircraft flights over Dolphin and Union Caribou  
2738 areas during calving and post-calving season.
- 2739 4.2.10 Work with federal-provincial-territorial committees/working groups so  
2740 that Canada 2020 goals and objectives can help inform approaches to  
2741 management of Dolphin and Union Caribou.
- 2742
- 2743 4.3 Manage populations of other species that affect Dolphin and Union Caribou  
2744 habitat.
- 2745 4.3.1 Promote traditional harvesting of overabundant species through  
2746 subsistence and sport hunts.
- 2747 4.3.2 Approach other governments to open hunting season earlier for geese.
- 2748 4.3.3 Promote collection of geese eggs within communities.
- 2749

2750 **Objective #5:**

2751 **Ensure management is based on population level so future generations can benefit**  
2752 **from sustainable harvesting opportunities.**

- 2753 5.1 Obtain accurate harvest data.
- 2754 5.1.1. Increase awareness of the importance of reporting accurate and complete  
2755 harvest data.
- 2756 5.1.2. Work with local HTOs/HTCs and regional Wildlife Management Boards to  
2757 collect accurate information on harvest levels, including submission of  
2758 harvest return sheet. .
- 2759 5.1.3. Report estimated total harvest levels, including the number harvested  
2760 and the sex ratio, to caribou co-management partners.
- 2761
- 2762 5.2 Manage harvesting activities within acceptable limits using adaptive management  
2763 techniques included in Section 6, to ensure that harvesting opportunities are  
2764 available in the future and treaty rights are fully respected.

- 2765 5.2.1. Investigate and consider defining acceptable harvest levels appropriate for  
2766 different population size and trend in the population.
- 2767 5.2.2. Elders teach youth and less experienced hunters about wise harvesting  
2768 practices that minimize negative impacts on caribou; includes no wasting of  
2769 meat, harvesting only what is needed, proper marksmanship, ability to  
2770 distinguish types and sex of caribou; avoid harvest of cows with calves as  
2771 well as population leader; submission of samples.
- 2772 5.2.3. Promote alternative food sources through encouraging harvest of other  
2773 species.
- 2774 5.2.4. Annually review harvest levels and make management recommendations if  
2775 necessary (e.g., temporary harvest limitations).
- 2776 5.3 Manage predators using adaptive management techniques included in Section 6,  
2777 as a natural and necessary part of the ecosystem.
- 2778 5.3.1. Educate and train hunters about how to harvest predators.
- 2779 5.3.2. Continue current management of predator harvesting, according to each  
2780 jurisdiction's needs.
- 2781

2782 **APPENDIX C: EFFECTS ON THE ENVIRONMENT AND OTHER**  
2783 **SPECIES**

2784 A strategic environmental assessment (SEA) is conducted on all federal SARA recovery  
2785 planning documents, in accordance with the Cabinet Directive on the Environmental  
2786 Assessment of Policy, Plan and Program Proposals (Canadian Environmental Assessment  
2787 Agency and Privy Council Office 2010). The purpose of a SEA is to incorporate  
2788 environmental considerations into the development of public policies, plans, and program  
2789 proposals to support environmentally sound decision-making and to evaluate whether the  
2790 outcomes of a recovery planning document could affect any component of the environment  
2791 or any of the *Federal Sustainable Development Strategy's* (Environment Canada 2013) goals  
2792 and targets.

2793 Conservation planning is intended to benefit species at risk and biodiversity in general.  
2794 However, it is recognized that plans may also inadvertently lead to environmental effects  
2795 beyond the intended benefits. The planning process based on national guidelines directly  
2796 incorporates consideration of all environmental effects, with a particular focus on possible  
2797 impacts upon non-target species or habitats. The results of the SEA are incorporated  
2798 directly into the plan itself, but are also summarized below in this statement.

2799 It is anticipated that the activities identified in this management plan will benefit several  
2800 species and the environment by promoting the conservation of Dolphin and Union Caribou.  
2801 A number of species listed under SARA are present within the range of Dolphin and Union  
2802 Caribou, including Peary caribou (*Rangifer tarandus pearyi*), polar bear (*Ursus maritimus*),  
2803 peregrine falcon (*Falco peregrinus anatum/tundrius*), red knot (*Calidris canutus islandica*  
2804 and *rufa* subspecies, eskimo curlew (*Numenius borealis*), and short-eared owl (*Asio*  
2805 *flammeus*). Species under consideration for SARA are also present in the range of Dolphin  
2806 and Union Caribou and include grizzly bear (*Ursus arctos*), wolverine (*Gulo gulo*), buff-  
2807 breasted sandpiper (*Tryngites subruficollis*), and red-necked phalarope (*Phalaropus*  
2808 *lobatus*). Some species that are not listed under SARA but are considered rare include  
2809 Banks Island alkali grass (*Puccinellia banksiensis*), and Drummond bluebell (*Mertensia*  
2810 *drummondii*).

2811 Predators to Dolphin and Union Caribou, like the Arctic wolf (*Canis lupus arctos*), may  
2812 benefit from an increase in caribou populations particularly if other prey species such as  
2813 muskoxen (*Ovibos moschatus*) decline. However, increases to predator populations may  
2814 have adverse impacts to Dolphin and Union Caribou if their populations become very large.  
2815 Conversely, a reduction in Dolphin and Union Caribou populations may have negative  
2816 implications for predators. Species that share the same area with Dolphin and Union  
2817 Caribou may also benefit from Dolphin and Union Caribou habitat conservation measures.

2818 Provided conservation measures and management actions are applied, it is unlikely that  
2819 the present management plan will produce significant negative effects on the Arctic  
2820 environment.

2821 This management plan will contribute to the achievement of the goals and targets of the  
2822 *Federal Sustainable Development Strategy for Canada* (Environment Canada 2013). In  
2823 particular, the plan directly contributes to the Government of Canada's commitment to  
2824 restore populations of wildlife to healthy levels, protect natural spaces and wildlife, and  
2825 protect the natural heritage of our country.

2826

2827

# **Dolphin and Union Caribou First Joint Meeting Report**

Kugluktuk, March 25-27 2015



Department of Environment, Government of Nunavut Iqaluit, Nunavut

## Executive Summary

On March 25-27, 2015 a joint meeting was held in Kugluktuk, NU. This meeting was organized by the Government of Nunavut and all co-managements partners were present: Nunavut Tunngavik Inc (NTI), the Hunters and Trappers Organization (HTO) from Kugluktuk and Cambridge Bay, Kitikmeot Regional Wildlife Board (KRWB), Kitikmeot Inuit Association (KIA), Olohaktomuit Hunters and Trappers Committee, Paulatuk Hunters and Trappers Committee/Inuvialuit Game Council, Wildlife Management Advisory Committee (WMAC), Government of Northwest Territory and Environment Canada. The participants are listed in Appendix I, followed by the workshop agenda, Appendix II and presentations in Appendix III. Over the three day meeting, delegates and representatives from co-management organizations engaged in round table discussion. They discussed the status of the Dolphin and Union Caribou and the framework of a joint management plan.

Various threats facing Dolphin and Union Caribou were brought to the table in addition to the numerous concerns of HTO's from both Nunavut and Northwest Territories. Discussions surrounding possible mitigation actions, management strategies, anthropogenic and natural threats, population fluctuations, migration changes and the effects of hunting and predation were all discussed at length. Meeting delegates unanimously agreed that furthering our understanding of the migration behaviors and the natural mortality that occurs while crossing sea ice had to be investigated further. The impact of wolves and grizzly bears on calving and wintering grounds was highlighted as a research priority, as was the significance of marine traffic affecting sea ice formation during the fall and spring migrations. It was agreed that delays in sea-ice formation during the fall migration would likely be of increasing concern in the future, as temperatures in the Arctic continue to rise. Potential management actions were discussed at length, however it was decided that no management actions should be decided until more information pertaining to population size, calving success, predation and migration behaviors could be answered.

During the joint meeting, scientific information was presented to the participants to reflect past monitoring efforts on the Dolphin and Union Caribou. Community perspectives on Dolphin and Union caribou were highlighted, as well as the current usage of this resource by the community and a review of existing and future threats was discussed. The need to have a common management plan in place created jointly by the different jurisdictions was well founded. Based on extensive discussions between all co-management partners at this meeting, a draft framework was produced.

Finally, the last session of the meeting was reserved for Traditional Inuit Knowledge perspectives. Two elders, Tommy Norberg and Isaac Klengenber joined the discussion to provide their knowledge and insight into the Dolphin and Union Caribou movements and population fluctuation during their lifetimes.

The Government of Nunavut, Department of Environment (DOE) will consider information shared during the workshop to write a joint Dolphin and Union Management Plan. Thus, the joint meeting report will be used by the delegates to report back to their communities and share

the information provided at this initial meeting. A second meeting of this group is tentatively planned for late 2015 in Cambridge Bay.

## Preface

This report represents the Government of Nunavut, Department of Environment's best efforts to accurately capture and translate all the information that was shared during the Dolphin and Union Caribou joint meeting with the inter-jurisdictional co-management partners.

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



Delegates during the first day of the Joint Dolphin Union Management Meeting in Kugluktuk

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## 1.0 Purpose and Objectives of the Workshop

### 1.1 Meeting Objectives

The purpose of the workshop was to bring wildlife co-management partners together to share knowledge on the Dolphin and Union Caribou, share concerns, and work collaboratively towards a draft framework. The meeting objectives were as follows:

- ❖ Review scientific background and current and on-going research programs
- ❖ Review and discuss the proposed management planning process for the Dolphin-Union Caribou Management Plan
- ❖ Develop a management framework to address species needs, threats, management objectives and broad strategies and conservation measures
- ❖ Identify, review and discuss Inuit Quajimajatuqangit and Traditional Ecological Knowledge and establish how it can be incorporated into the management plan
- ❖ Seek a commitment from participants on how to engage and participate in the development of the Dolphin and Union Caribou Management Plan

The workshop was divided into two different sections:

- 1) Joining different management processes and what do we know?
- 2) What can we do to conserve the Dolphin and Union?

The goal of the first session was to inform participants about current on-going research programs, clarify with the co-management partners the different territorial and federal processes in place that require a management plan, and the need to work together to avoid duplicating efforts and to make it a more homogeneous process. The second session aimed to propose a framework for developing a joint Dolphin and Union Management Plan and discuss how Traditional Knowledge can be equally incorporated into the management plan, as per the Nunavut Land Claims Agreement (NLCA). Thus, this joint meeting engaged the co-management partners in the development of a Dolphin and Union management plan. This report was written based on the discussion that took place during the meeting; verbal quotes from the participants are italicized, whereas information taken from notes and minutes are not.

## 2.0 Workshop Participants and Structure

### 2.1 Workshop Participants

The workshop was attended by the representatives from the following organizations:

Canada:

- Environment and Climate Change Canada (ECCC)

Northwest Territory:

- Olohaktomuit Hunters and Trappers Committee
- Paulatuk Hunters and Trappers Committee/Inuvialuit Game Council
- Wildlife Management Advisory Committee (WMAC)
- Government of Northwest Territory (GNWT)

Nunavut:

- Hunters and Trappers Organizations (HTOs)- Kugluktuk, Cambridge Bay
- Elder Advisory Committee (EAC) with the Department of Environment
- Nunavut Tunngavik, Inc (NTI)
- Kitikmeot Regional Wildlife Board (KRWB)
- Kitikmeot Inuit Association (KIA)
- Department of Environment, Government of Nunavut (DOE)

## **2.2 Format of Discussions**

During the workshop, presentations by biologists and collaborators provided background information on the current population and status of the Dolphin and Union Caribou and the process of species-at-risk and management planning for each jurisdiction. Presentations were followed by a question and answer period allowing delegates to provide input based on their experience and observations. Since the group was relatively small, there were no “breakout sessions”, but a group discussion and round table conversations took place to capture the perspectives and current management practices from each of the co-management partners.

One afternoon was dedicated to compiling a rough framework of a potential shared management plan between the three governmental jurisdictions taking into consideration all comments and concerns expressed by other co-management partners and elders that were present. This framework is provided below as management objectives and concerns about threats on the Dolphin and Union Caribou population. It is a compilation of efforts representing both scientific and Traditional Knowledge expertise.

This framework is a working document that will be modified and further discussed with the co-management partners and reviewed at a tentative fall meeting after survey and collar data have been completed.

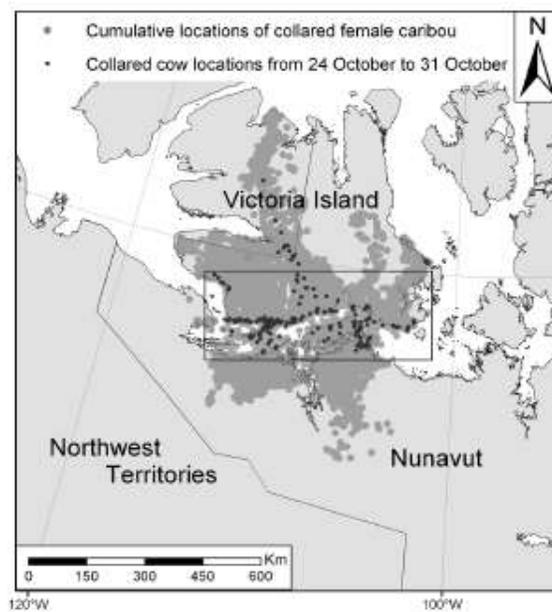
## **3.0 Session 1: Joining Differing Management Processes and Addressing Knowledge Gaps**

### **3.1 Scientific Background**

Scientific information was presented to the participants; the past monitoring efforts of the Dolphin and Union Caribou and the proposed research program for 2015-2019. The Dolphin and

Union Caribou is the most genetically differentiated of the barren-ground caribou and have unique migration behaviors and a distinct phenotype. They do not form well-defined calving ground and have a more individualist calving strategy followed by fall and spring sea-ice migrations. The Wildlife Biologist, Lisa-Marie Leclerc and Jan Adamczewski presented more specific information from their respective jurisdictions.

The DOE presented information on the distribution, the migration pattern and the previous population surveys of this unique caribou. The range of the Dolphin and Union Caribou encompasses the west and east side of Bathurst Inlet for wintering ground and uses most of Victoria Island for summering ground (Figure 1). Dumond and Lee<sup>1</sup> (2013) provided revised estimates of  $34,558 \pm 95\% \text{ CL } 6,801$  in 1997 and  $27,878 \pm 95\% \text{ CL } 7,537$  in 2007 (Figure 2). Co-management partners provided information on a potential crossing between Victoria Island and King William Island that was previously unreported in the scientific literature and this local knowledge will be incorporated to forge the current research programs.



*Figure 1: From 1999-2005 satellite collar locations, the cumulative annual distribution of Dolphin and Union caribou was generated and represented on the picture in grey (from Dumond and Lee, 2013)*

<sup>1</sup> Dumond M. and Lee D. (2013). Dolphin and Union Caribou herd Status and Trend. Arctic. Vol 66. No 3: 329-337.

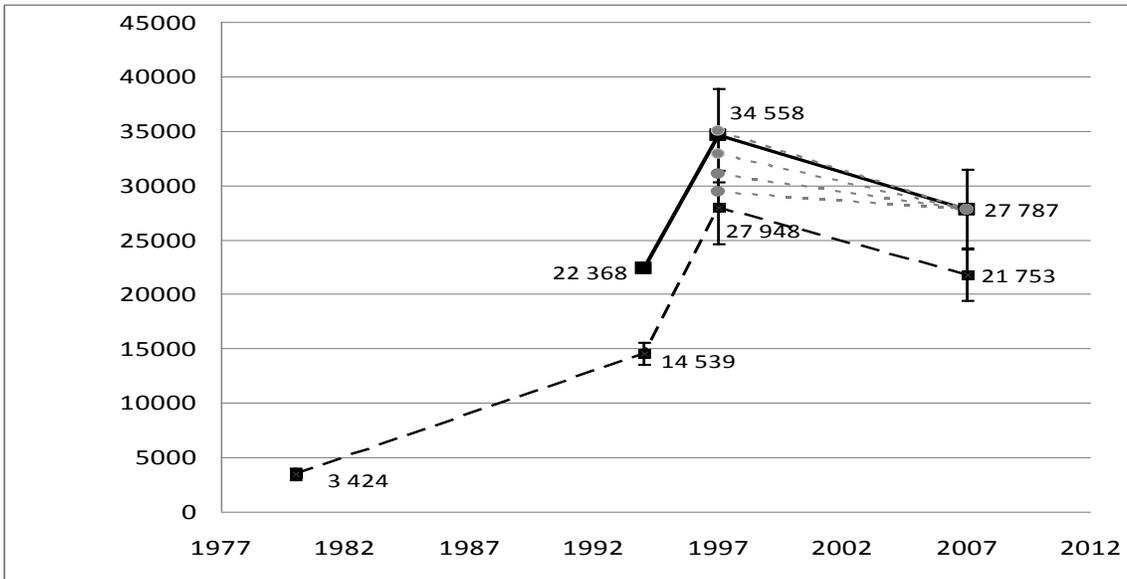


Figure 2: Variation of the Dolphin and Union caribou herd estimates from 1980 to 2007. The dark grey dashed line shows the estimate in the study area and the black solid line shows the extrapolated estimate for the whole herd (from Dumond and Lee, 2013).

The Dolphin and Union research program 2015-2019 will aim to fill the following knowledge gaps:

- Population estimates and habitat selection/range
- Herd health (diseases and toxicology)
- Use of new technologies (drones and new collar design)
- Mortality associated with fall migration and its impact on the herd

The GNWT presented background information from the “Species Status Report for Dolphin and Union Caribou (*Rangifer tarandus groelandicus x pearyi*) in the Northwest Territories” document written by the Species at Risk Committee (SARC) in 2013. An animation showing the compilation of collared caribou movement by NWT and Nunavut from 1987 to 2006 was presented. Attention was drawn to the fall and spring migration date as well as the main crossing point. From what is seen today, difference in the Dolphin and Union migration pattern was highlighted. This animation revealed one of the numerous applications of collaring caribou. Thus, the Dolphin and Union are found in the Northwest part of Victoria Island from July to October.

### 3.2 Processes under the Federal Species at Risk Act (SARA) and Territorial Species at Risk (NWT) Act.

Environment and Climate Change Canada:

The Dolphin and Union caribou was assessed by COSEWIC in 2004 and listed under the *Species at Risk Act (SARA)* in 2011 as a species of Special Concern. Due to this Special Concern status, a Dolphin and Union Management Plan is required before 2016/2017 under the “Three-Year Recovery Document Posting Plan”. This federal legislation was explained to all co-management

partners and example of completed management plans for other species under the same listing was brought to the table as an object of discussion.

Government of Northwest Territories:

The Territorial *Special at Risk (NWT) Act* assessed the status of the Dolphin and Union caribou in 2013 and this species was then listed in 2015 as a species of Special Concern. Under this status, GNWT has until March 2017 to complete a management plan for the NWT. The management plan has a more specific layout with the first section covering the background information about the species biology and a section about the strategies and approaches to attain the management goal.

Government of Nunavut/ NTI

The Government of Nunavut, Department of Environment (DOE), is responsible for the protection, management and sustainable use of the caribou, such as the Dolphin and Union. The DOE is also responsible for conducting research, in addition to provide supportive information to the co-management partners, is involved in development of management plans for sound management. The *Nunavut Wildlife Act* recognizes Inuit *Qaujimagatuqangit* (IQ) and NTI ensures that Inuit knowledge is then integrated fully into management planning. As the provisions for Species at Risk designation under the *Nunavut Wildlife Act* have not been enacted, Nunavut does not have to produce a management plan by a specific date.

### 3.3 Community Perspectives:

Round table discussion (from minutes):

**Ulukhaktok:** The development of a young hunter program was suggested as a means to keep the younger generation on the land and to learn traditional methods of hunting and harvest. Concerns regarding freezing rain events affecting spring and fall survival of caribou were brought up, these were also shared by the other communities. Community members were being paid to collect sea ice thickness using Polar Bear funding and this could be a way of increasing community engagement. Harvest reporting in Ulukhaktok is carried out by having a community member go door-to-door to collect harvest records that otherwise would not be accounted for. Concerns regarding the future of healthy and abundant land foods for future generations were made very evident by Joshua Oliktuak, who emphasized the importance of maintaining sustainable levels of caribou in Nunavut and The Northwest Territories. The suggestion was made that industry should be responsible for paying for research to address the questions of impacts on adjacent areas.

**Paulatuk:** No comments

**Tuktoyaktuk:** The community of Tuktoyaktuk had recently created a park that was known to be a key calving area for the Bluenose West herd, but allowed for Inuit harvest and access for hunting. There was a suggestion to pursue a similar project for caribou calving grounds in Nunavut. This community is concerned regarding cruise ships dumping bilge water into the gulf. In addition, they expressed concern about the impacts of tourists and potential invasive plants

and insects if visitors leave the cruise ships. The importance of understanding animal movements was expressed by Charles Pokiak and he acknowledged that the impacts on animals that occurs from collaring was worth undertaking for the information gained. The ability for communities to meet face-to-face with biologists was also expressed as an important aspect for caribou research.

**Cambridge Bay:** Jimmy Haniliak explained how in the 1950's when he moved to Cambridge Bay, that no island caribou were seen and he had to travel to the mainland (Bay Chimo) to find them. When island caribou began to return, he would travel 100 miles northwest where he would get Peary Caribou, which tasted different than mainland caribou. He noticed that some animals would drown going south and that those returning in the spring were thin and had little fat reserves. Discussions with elders from Cambridge Bay seems unanimous that there has been an observed change in migration route during the fall, utilizing areas east of Cambridge Bay to a much larger extent than previously. Movements from Ferguson Lake east, with crossings to King William Island have been observed personally by Jimmy Haniliak and also believed they return the same way in May. Concerns regarding increased numbers of Grizzly bears and wolves on Victoria Island were expressed multiple times. Human garbage and debris has been observed affecting caribou, such as barbed wire caught in the antlers of caribou. Ships breaking sea ice in the fall was a major concern expressed by every community. This was experienced by people from Cambridge Bay when NTCL were breaking ice in the channel every 12 hours. This prevented caribou from crossing the channel. The suggestion of allowing HTO's to charge fees for land use was made.



*Photo 1: Elder Jimmy Haniliak showing where Dolphin-Union Caribou were now crossing sea ice in eastern Victoria Island*

**Kugluktuk:** Concerns regarding caribou mention them been seen frozen in ice and groups as large as 150 animals could be seen floating on large pieces of ice in the Coronation Gulf. Multiple mentions of caribou being seen with ice balls on their fur in the fall from having fallen through sea ice during their migration were made. Jorgan Bolt mentioned that he has seen bugs being so thick that caribou would be seen running kilometers, just to turn around and return to

the same location. Trying to escape this insect harassment meanwhile prevented the caribou from grazing to increase their fat storage. Changing sea ice conditions were a cause of concern for elder Isaak Klengenberg, who had to leave his outpost camp due to the later formation of sea ice, which prevented him from accessing it in the spring and fall. He mentioned that he used to see flocks of gulls gathering around frozen caribou in the ice; the gulls would feed off them. Elder Tommy Norberg mentioned that close by the islands north-east of Kugluktuk (Berens Islands), where the sea ice is often thinner near the edges, caribou were seen either drowned in the water or had died from freezing on the bedrock. He followed up with saying that this happen a number of years ago and that today, most island caribou don't cross in this area anymore.



**Gjoa Haven:** James Qitsualik Taqaugak confirmed Jimmy Haniliak's observations of caribou crossing from Victoria Island to King William Island. He also expressed concern regarding predator increases and the potential impact of forest fires on wintering caribou.

In the past, the Inuit always kept their camps away from migration routes to avoid disturbing the caribou as they moved between summer and wintering grounds. James also spoke of how respect for using the caribou carcass has changed. In the past, cutting up a carcass was a very careful ordeal, making sure not to cut through sinew, while today people just used saws to butcher carcasses and these traditions are being lost.

*Photo 2: Elder Tommy Norberg showing where Dolphin-Union Caribou wintered south-east of Kugluktuk*

### **Predators:**

Many comments were received from all communities regarding the potential impacts of increased predator populations in the Arctic, mostly the perceived increase in wolves and grizzly bears. Observations from delegates on grizzly predation on calving grounds and increased observations of both predators on King William Island and Victoria Island were made. There was acknowledgement that predators have been interacting with caribou for millennia and they haven't been responsible for the extirpation of any caribou herds.

Some examples of previous predator control were made by delegates, including stories of killing wolf pups near calving ground and poisoning wolves along migration corridors. Poisoning can have serious detrimental effects on other scavengers and this wasn't the best form of predator management.

A suggestion to increase bounties on wolves in Nunavut was made, as it has been done in NWT and was supported by most communities. Increases in gas prices have negatively affected hunters and fewer people travel on the land due to the extra costs. Comments from delegates confirmed that there was no interest in mass slaughter, but rather would prefer a controlled management to keep numbers from increasing too quickly. The Inuit have always respected wolves and the role they play in the Arctic ecosystems. Examples of this were given by Philip Kadlun, who said when he was living on the land, they would sometimes find aborted wolf pups near dens at times of low caribou numbers.

There are also questions regarding the impact that industrial activities have in the NWT, forcing predators further north due to noise and mechanical disturbances.

It would be important to have a predator monitoring program in place in the region. Thus, even if the HTOs request a wolf bounty, it was made clear that the GN-DOE does not support such an initiative. However, DOE mentioned that there is no limitation on the number of wolves that can be harvested.

## **4.0 Session 2: What can we do to conserve the Dolphin and Union**

### **4.2 Framework of the Management plan**

#### **Management plan group direction:**

The management plan should incorporate equally scientific knowledge and traditional knowledge drawn from other existing caribou management plan, but be specific to the uniqueness of the Dolphin and Union caribou.

#### **Management goal/vision:**

A) To ensure a sustainable population of Dolphin and Union caribou and intact habitat, that offers harvesting opportunities for present and future generations, recognizing the cultural importance of Dolphin and Union caribou.

or

B) To ensure a sustainable population of Dolphin and Union caribou and intact habitat, that allows for human use of caribou and their habitat while respecting conservation concerns.

#### Objectives:

These are 5 recommended objectives for the management of Dolphin and Union caribou. These objectives should be applied across the NWT - Nunavut population.

1. Ensure there is adequate and intact habitat with minimal human disturbance (in particular, migratory sea-ice route) to maintain a healthy and sustainable population of Dolphin and Union caribou.
2. Ensure that harvest of Dolphin and Union caribou is sustainable.
3. Collect scientific, technical and traditional information on Dolphin and Union caribou ecology, key habitat, demographic indicators, and cumulative effects to inform sound management decisions.
4. Communicate and share information on an ongoing basis with co-management partners, communities, industry and the public to inform them about monitoring and managing dolphin-union caribou.
5. Adaptively co-manage Dolphin and Union caribou by using a grassroots (bottom up approach) and using the best traditional, scientific, and technical information available.

#### Approaches and actions to achieve these objectives:

Recommended approaches (numbered as X.X.) are grouped on the following pages under each objective. More specific actions (numbered as X.X.X) are grouped below under each approach.

#### **Objective #1:**

**Ensure there is adequate and intact habitat with minimal human disturbance (in particular an intact migratory sea-ice route) to maintain a healthy and sustainable population of Dolphin and Union caribou.**

- 1.1 Monitor and minimize human/industrial disturbance.
  - 1.1.1 Monitor industrial shipping traffic.
  - 1.1.2 Work with Transport Canada to regulate shipping and industry activities seasonally.
  - 1.1.3 Work with tourism industry to regulate cruise ships as well as human traffic on land;
  - 1.1.4 Establish seasonal limitations for industry shipping and cruise ships during calving and migration seasons.

- 1.1.5 Develop guidelines, standard advice, and best practices for shipping, tourism and industry;
  - 1.1.6 If necessary, in response to caribou lifecycles and changes to habitat recommend that shipping, cruise ships and/or industrial activities be scaled back or temporarily discontinued.
  - 1.1.7 Identify organizations (e.g., HTOs and communities) who could/would play a lead role in promoting standard advice and guidelines for industry.
  - 1.1.8 Develop an oil spill response plan.
- 1.2 Monitor changes to habitat on an ongoing basis.
    - 1.2.1 Track human-caused landscape changes, using both remote sensing and current disturbance data from industry.
    - 1.2.2 Compile and manage spatial information on landscape change.

**Objective #2:**

**Ensure that harvest of Dolphin and Union caribou is sustainable.**

- 2.1 Obtain accurate harvest data through measuring harvest levels.
  - 2.1.1. Educate people on the importance of reporting harvest.
  - 2.1.2. Work with local Hunters & Trappers Committees/Associations, and local Wildlife Advisory Boards to collect accurate information on harvest levels of Aboriginal hunters.
  - 2.1.3. Report estimated total harvest levels, including the number harvested and the sex ratio, to caribou management authorities.
- 2.2 Manage the harvest to ensure it is sustainable.
  - 2.2.1. Investigate and define *sustainable harvest* levels.
  - 2.2.2. Elders teach youth about wise harvesting practices that minimize negative impacts on caribou; includes no wasting of meat, avoidance of overharvesting, proper marksmanship, ability to distinguish types of caribou; avoidance of harvesting cows with calves.
  - 2.2.3. Investigate the possibility of promoting alternative food sources as an alternative to harvesting of Dolphin and Union caribou.
  - 2.2.4. Periodically review harvest levels and make management recommendations if necessary (e.g. temporary harvest limitations).

**Objective #3:**

**Collect scientific, technical and traditional information on Dolphin and Union caribou ecology, health, key habitat and population indicators, impacts of human activities, and cumulative effects to inform sound management decisions.**

- 3.1 Incorporate community and traditional knowledge on an ongoing basis.
  - 3.1.1 Ensure that plans and activities for Dolphin and Union caribou management are informed by community and traditional knowledge through ongoing communication between co-management partners and through supporting community monitoring programs.
- 3.2 Identify knowledge gaps and establish high priority research questions.

- 3.2.1 Conduct research on Dolphin and Union caribou to determine health, condition and test for possible contaminants.
- 3.3 Improve our understanding of Dolphin and Union caribou distribution and relationships
  - 3.3.1 Identify geographic areas of importance to Dolphin and Union Caribou through research and traditional knowledge.
  - 3.3.2 Monitor changes in predator populations
  - 3.3.3 Promote research on relationships between Dolphin and Union caribou and predators (including new predators)
  - 3.3.4 Promote research on relationships between Dolphin and Union caribou and other species (e.g. ungulates, geese)
- 3.4 Estimate population trends in each region.
  - 3.4.1 Expand community monitoring programs that provide information on Dolphin and Union caribou health and condition, habitat vital rates, numbers, and population trends and predator changes.
- 3.5 Develop an approach to modelling cumulative effects.
  - 3.5.1 Assess and manage cumulative impacts on Dolphin and Union caribou population and habitat.

**Objective #4:**

**Communicate and share information on an ongoing basis with co-management partners, communities, industry and the public to inform them about monitoring and managing dolphin-union caribou.**

- 4.1 Encourage flow and exchange of information between parties, using various approaches, depending on group/demographic.
  - 4.1.1 Conduct “out on the land” trips, where more experienced hunters (elders if they’re able) take youth out on the land.
  - 4.1.2 Use social media and the internet to reach out to youth.
  - 4.1.3 Conduct school visits to educate youth about managing Dolphin and Union caribou
  - 4.1.4 Conduct community meetings to inform communities about managing Dolphin and Union caribou.

**Objective #5:**

**Adaptively co-manage Dolphin and Union caribou by using a grassroots, bottom up approach and using the best traditional, scientific and technical information available.**

- 5.1 Work with co-management partners, Aboriginal governments and organizations, local harvesting committees, and industry to share information and collaborate on management actions.
  - 5.1.1 Continue to work with wildlife management advisory boards, game councils and local HTOs on Dolphin and Union caribou monitoring, stewardship and management.
  - 5.1.2 Investigate the potential of having industry contribute information to research.

- 5.1.3 Continue engaging hunters, industry and public about Dolphin and Union caribou management.
  - 5.1.4 Annually review new information on population and habitat, and adapt management practices accordingly.
  - 5.1.5 If necessary, recommend alternative management actions (e.g., stricter habitat and/or harvest management) allowing for natural variation in numbers.
  - 5.1.6 Annually report on management actions and progress made toward meeting objectives in management plan.
- 5.2 Co-ordinate research among different partners
- 5.2.1 Co-ordinate research activities with different research institutions to minimize impacts on Dolphin and Union caribou.
  - 5.2.2 Ensure local involvement in research activities (planning, field research)
  - 5.2.3 Potentially charge fees (higher fees if already in existence) to research institutions for conducting research.
- 5.3 Work with all levels of governments to manage populations of other species (particularly geese).
- 5.3.1 Approach other provincial governments to open hunting season earlier
  - 5.3.2 Promote harvesting of geese through subsistence and sport hunts
  - 5.3.3 Educate communities/ promote collection of eggs
- 5.4 Work with communities to reduce release of contaminants through various venues (see 4.1).

### 4.3 Threats to the Dolphin and Union caribou

During the meeting, the following threats were identified and then listed in priority. Approaches to address these threats were also identified by participants wherever possible. Each threat and approach has been linked to a specific objective in the framework.

#### Threats:

- Climate change (warmer weather, icing events, more severe storms)
- Drowning and dangerous sea-ice crossing
- Shipping – both industrial and cruise ships (ice-breaking-check specs of “ice-breaking” ie. Ice thickness)
  - invasive species, as a result of dumping of grey water)
  - Contaminants (eg. Oil spill causes destruction of shoreline and potential calving habitat)
- Human activities (conducting research)
- Industrial development
- Harvesting (wastage of meat and over- harvesting)

- Predation (wolves, bears)
- Disease (emerging or increase in disease and parasites)
- Insects (increase in, and/or types)
- Relationship between other species (eg. musk-ox, geese) and caribou (predation, habitat degradation, competition for food)
- Impacts of salt on habitat
- Shipping of oil containers (oil spills)
- Tourism (eg. Cruise ships)

	<b>Threat</b>	<b>Approach that addresses threat</b>	<b>Integrated into Objective # Approach #</b>
1.	Climate Change (resulting in drowning and dangerous sea-ice crossing)		Obj. #1
2.	Shipping: breaking of sea-ice and tourism (tourists go on land) - Also includes shipping of oil containers.	- Regulate shipping activities seasonally (eg. , migration) Develop guidelines and best practices for shipping companies - Monitor ship traffic - Work with Transport Canada and industry to establish seasonal limitations - Develop an oil spill response plan	Obj. #1 1.1.4 1.1.5  1.1.1 1.1.2 1.1.4  1.1.8
3.	Harvesting (wastage of meat and over-harvesting)	Obtain accurate information to estimate population Approach: Manage harvest to ensure it is sustainable: Actions: - Obtain accurate harvest data (measure harvest levels) Investigate and define “sustainable harvest levels - Periodically review harvest levels and make harvest strategies and recommendations if necessary. Community education (Elders teaching youth: - wise harvesting practices; - “Out on the land” trips	Obj. #2  2.2  2.1  2.2.1  2.2.4  2.2.2  4.1.1

	<b>Threat</b>	<b>Approach that addresses threat</b>	<b>Integrated into Objective # Approach #</b>
		Consider alternative species to harvest	2.2.3
4.	Industrial activities – mining (oil and gas exploration)	<ul style="list-style-type: none"> <li>- Develop guidelines, standard advice, and best practices for shipping and industry; potentially have industry contribute to research</li> <li>Minimize human/industrial disturbance</li> <li>- Regulate activities seasonally (e.g. limit activities during calving and migration seasons)</li> <li>- Identify organizations (e.g., HTOs and communities) who could play a lead role in promoting these guidelines.</li> <li>- If necessary, in response to caribou lifecycles and landscape changes, recommend that development activities be scaled back or temporarily discontinued</li> </ul>	<p>1.1.5</p> <p>5.1.2</p> <p>1.1</p> <p>1.1.2</p> <p>1.1.4</p> <p>1.1.7</p> <p>1.1.3</p>
5.	Predation (wolves, bears)	<ul style="list-style-type: none"> <li>- Monitor predator changes (change of predator species)</li> <li>- Research predator-prey relationships among new predators</li> <li>- Conduct and gather research on wolves (correlation between wolf population numbers and caribou pop numbers)</li> <li>- Consider responsible wolf harvesting through: Community education Traditional harvesting</li> </ul>	<p>3.3.2</p> <p>3.4.1</p> <p>3.3.3</p> <p>3.4.1</p> <p>3.3.3</p> <p>3.4.1</p>
6.	Human Activities including: - Conducting research Tourism, Includes: <ul style="list-style-type: none"> <li>• Cruise ships</li> <li>• Low-flying aircraft</li> <li>• Air-borne pollutants</li> <li>• Movement of tourists walking around in caribou habitat</li> </ul>	<ul style="list-style-type: none"> <li>- Coordinate research activities with different research groups to minimize impacts</li> <li>- Identify knowledge gaps and establish high priority research questions</li> <li>-Ensure local involvement in research activities (planning, field research)</li> <li>- Charge fees for conducting research</li> <li>- Have seasonal limitations on cruise ships &amp; limitations to tourists walking in caribou habitat</li> </ul>	<p>5.2.1</p> <p>3.2</p> <p>5.2.2</p> <p>3.1.1</p> <p>5.2.3</p> <p>1.1.3</p> <p>1.1.4</p> <p>1.1.5</p>

	<b>Threat</b>	<b>Approach that addresses threat</b>	<b>Integrated into Objective # Approach #</b>
7.	Disease	- Conduct research on caribou to determine health	3.2.1 3.4.1
8.	- Presence of other species (eg. musk-ox, geese) causing habitat degradation and competition for food	-Examine relationship between other species and caribou - Work with all levels of governments to manage numbers of geese - Approach other provincial governments to open hunting season earlier - Promote harvesting of geese through subsistence and sport hunts - Educate communities/ promote collection of eggs	3.3.4 5.3 3.1.1
9.	Contaminants - includes impacts of salt on habitat	- Conduct research on caribou to determine health - Decrease local community release of contaminants	3.2.1 3.4.1 5.4 4.1
10	Insects	- Conduct research on caribou to determine health - Expand community monitoring programs that provide information on caribou health	3.2.1 3.4.1 3.1.1
11	Forest fires (smoke, air-borne pollutants)	- Conduct research on caribou to determine health - Expand community monitoring programs that provide information on caribou health	3.2.1 3.4.1 3.1.1
<b>Knowledge Gaps</b>			
	Conduct research on health of caribou including monitoring of health		3.2.1 3.4.1 3.1.1
	Research on predator-prey relationship		3.3.2 3.3.3 3.4.1
	Research on impacts of past predator culling programs		Use existing TK and academic info

### **4.3 Sharing IQ/Traditional Ecological Knowledge and Local Knowledge**

Elders had the opportunity to talk about what portions of the animal carcass were traditionally utilized and how each part of the caribou was used. Not only was the meat harvested, but also the organs in the chest cavity, liver, heart, digestive tract, and sinew were taken. Within the communities, successful hunters shared their catches not only with family or close relatives, but also with other community members in need. Since sharing is part of Inuit values, the workshop participants spoke of extending this cultural sharing to other communities in need, via a meat sharing distribution program.

### **Going Forward**

The draft management framework produced at this meeting will be distributed to all wildlife co-management partners for their review and input with their respective board(s) and/or organization(s). A second meeting of this group is tentatively planned for late 2015 in Cambridge Bay, where a request for youth delegation and elders should also take part.

## Appendix I: List of Participants

<b>Name</b>	<b>Community</b>	<b>Organization</b>
Joshua Oliktoak	Ulukhaktok	Olohaktomuit Hunters and Trappers Committee
Joe Illasiak	Paulatuk	Paulatuk Hunters and Trappers Committee/Inuvialuit Game Council
Charles Pokiak	Tuktoyaktuk	Wildlife Management Advisory Committee (WMAC)
James Qitsualik Taqaugak	Gjoa Haven	Kitikmeot Regional Wildlife Board (KRWB)
Jimmy Haniliak	Cambridge Bay	Cambridge Bay Hunters and Trappers Organization
Philip Kadlun	Kugluktuk	Kugluktuk Hunters and Trappers Organization
Colin Adjun	Kugluktuk	Kugluktuk Hunters and Trappers Organization
Jorgen Bolt	Kugluktuk	Kugluktuk Hunters and Trappers Organization
Luigi Toretti	Kugluktuk	Kitikmeot Inuit Association (KIA)
Tannis Bolt	Kugluktuk	Kitikmeot Inuit Association (KIA)
Tommy Norberg	Kugluktuk	Kugluktuk Elder and Knowledge Holder
Isaac Klengenber	Kugluktuk	Kugluktuk Elder and Knowledge Holder
David Lee	Quebec	Nunavut Tunngavik Inc. (NTI)
Lisa-Marie Leclerc	Kugluktuk	Government of Nunavut (DOE)
Myles Lamont	Kugluktuk	Government of Nunavut (DOE)
Mathieu Dumond	Kugluktuk	Government of Nunavut (DOE)
Lisa Worthington	Yellowknife	Government of NWT (GNWT)
Jan Adamczewski	Yellowknife	Government of NWT (GNWT)
Donna Bigelow	Yellowknife	Environment Canada (EC)
Amy Ganton	Yellowknife	Environment Canada (EC)

## Appendix II: Agenda

### Dolphin and Union Caribou Joint Management Planning Meeting

Ulu Visitor Center, Kugluktuk

March 25-27, 2015

#### Goals of the Meeting:

- Review and discuss the proposed management planning process for the Dolphin and Union Caribou Management Plan
- Develop a management plan framework: species needs, threats, management objectives, and broad strategies and conservation measures
- Review of scientific background and current on-going research investigation
- Identify, review and discuss IQ and TEK information and how it can be incorporated into the management plan
- Seek a commitment from participants on how to engage/participate in the development of the Dolphin and Union Caribou Management Plan

#### Day 1:

#### Session 1: Joining different management processes and what do we know?

---

8:30-9:00	<b>Arrival and Coffee</b>
9:00-9:10	<b>Welcome</b> <b>Opening Prayer</b>  <b>Opening Remarks</b> <b>Introductions</b>
9:10-12:00	<b>Dolphin and Union herd Background</b> -Previous aerial surveys (Kugluktuk and Cambridge Bay) Update on research and monitoring program Community Observations
<b>LUNCH</b>	
13:00-15:00	<b>Each jurisdiction explain their process- species at risk and management planning</b>  <b>Overview on how the joint process will work and the expected final product</b>
15:00-15:30	<b>HEALTH BREAK</b>
15:30-17:00	<b>Management goals and framework</b> Process consideration Goal, Objectives, Approaches

---

## Day 2:

### Session 2: What Can We Do to Conserve the Dolphin and Union?

---

8:30-9:00	<b>Arrival and Coffee</b>
9:00-9:10	<b>Opening Remarks for Day 2</b> <b>Overview of Day 1</b>
9:10-12:00	<b>Discussion group - Main concerns</b> Concerns (threats) about the Dolphin and Union caribou
<b>LUNCH</b>	
13:00-14:00	<b>Discussion group - Main concerns</b> Concerns (threats) about the Dolphin and Union caribou
15:00-15:30	<b>HEALTH BREAK</b>
14:00-17:00	<b>Management Practices</b> -Current and future practices -Group discussion

---

## Day 3:

### Session 3: What Can We Do to Conserve the Dolphin and Union?

---

8:30-9:00	<b>Arrival and Coffee</b>
9:00-9:15	<b>Opening Remarks for Day 3</b> <b>Overview of Day 2</b>
9:15 12:00	<b>Discussion group – What can be done?</b> Management recommendations - Framework Address key stewardship and caribou management questions
<b><u>LUNCH</u></b>	
13:00-16:00	<b>Integrating IQ, TEK, and Local knowledge with Science for management action</b> - Aboriginal management practices
16:00-17:00	<b>Next Step and Closing Remarks</b>

---

# Appendix III: Presentations



## Dolphin and Union Caribou

Government of Nunavut  
Department of Environment

Lisa-Marie Leclerc  
March 25, 26, 27, 2013

### Introduction

1. Background
2. Distribution
3. Migration pattern
4. Population surveys
5. Dolphin and Union 2015-2019 research program

### Background

Dolphin and Union caribou are intermediate in size and color between Peary caribou and Barren-ground caribou.

Dolphin and Union caribou is the most genetically differentiated of the barren-ground caribou (Zittlau, 2004) possibly due to genetic bottleneck.

Special behaviors:  
They do not form well define calving ground, as its calving strategy is mainly individualist (Nagy et al., 2011).  
Migratory herd crossing the sea-ice to reach their wintering and summering ground.

### Background

Dolphin and Union caribou are of great importance for the Inuit subsistence and cultural needs for the community

- Kughuktuk
- Cambridge Bay
- Bathurst Inlet
- Bay Chimo (Umingmaktok)
- Ulukhatak
- Pautatuk

*This herd is of great importance for subsistence and cultural needs.*

### Migration pattern



**Dolphin and Union Caribou**  
This herd migrates between the Peary Caribou range in the north and the Barren-ground Caribou range in the south. The herd is genetically differentiated from other barren-ground caribou herds.

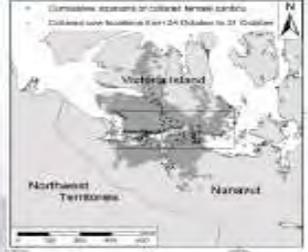
### Migration pattern

Fall migration

Spring migration

[Pool et al., 2010]

### Distribution



Victoria Island  
Northwest Territories  
Nunavut

[Dumond and Lee, 2013]

### Distribution

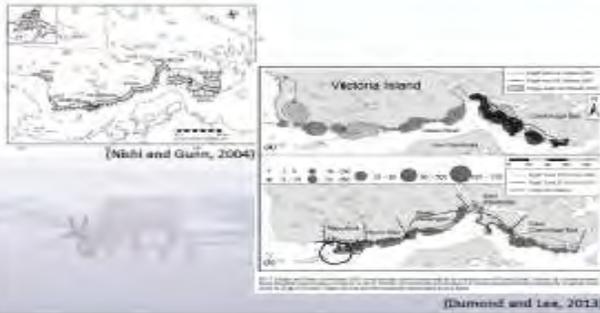


Victoria Island  
Nunavut

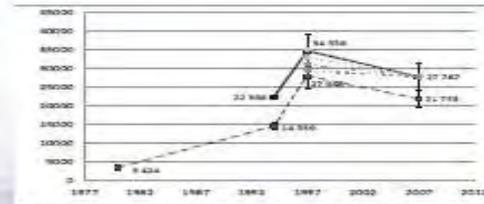
[Dumond and Lee, 2013]

[Northrup, 2015]

## Distribution



## Population status



(Diamond and Lee, 2013)

## Population status

Accurate long-term monitoring of this caribou herd is crucial to its management and conservation. We can only speculate about the factors responsible for the population dynamics observed for 1980-2007.

## Goal and Objectives

The main goal of this program is to closely monitor the population of the Dolphin and Union herd. Thus, this study will have four main objectives.

- 1) Population estimate of the Dolphin and Union caribou herd
- 2) Fall migration pattern, highest natural mortality (UVA)
- 3) Habitat selection and distribution (mineral exploration, mining activities)
- 4) Health monitoring (contaminant, diseases, stress level)

## Study area



## Anticipated Outcomes

- To update the status of the herd, and inform management about sustainable harvest for this herd.
- Identify and monitor some of its stressors
- Land use impact mitigations, impacts of maritime traffic
- Habitat requirement
- Improved monitoring of the population, including collaring of individuals.



## Discussion

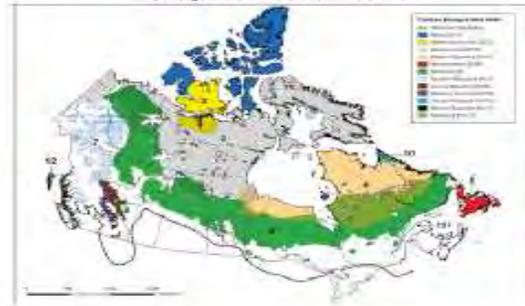
Dolphin-Union Caribou: Overview of Technical Information  
March 2015 GNWT



Photo: K. Poole

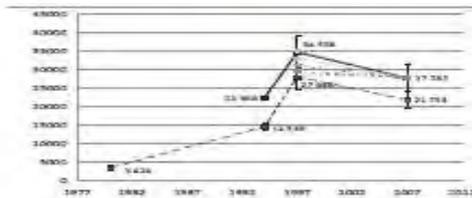


Kinds of Caribou in Canada  
('Designatable Units', COSEWIC 2011)



Dolphin-Union Caribou: Status Report 2013 for NWT

Dolphin-Union Caribou: Population Trend 1980-2007  
(From Dumont and Lee 2013)



Dolphin-Union Caribou: Population Trend Early 1900s to 2007  
(From NWT SARC Report 2013)

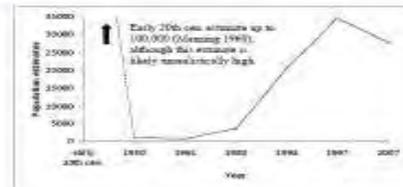


Figure 14. Depiction of approximate population estimates between the early 19<sup>th</sup> century and 2007 (Anderson 1932, Munnag 1949, Bendfield 1950, MacPherson 1963, Jankovich and Creffers 1989, Nyts and Buckland 2000, Nyts and Gunn 2004, Dumont and Lee 2013).

Dolphin-Union Caribou: Pregnancy Rate 1980s to early 2000s  
(From NWT SARC Report 2013)

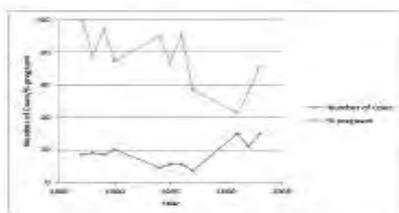


Figure 21. Pregnancy rates based on adult female collared and 1001-09 (128564-3013) and 1001-10 (99684-1086) and 1001-11 (94411-944) (944, 1993).

Dolphin-Union Caribou:

Range Based on Collared Caribou & Observations

(From NWT SARC Report 2013)



Dolphin-Union Caribou:  
 Calving Locations from  
 Collared Caribou 1987-2006  
 (From NWT SARC Report 2013)



Caribou Numbers on NW Victoria Island: Peary & Dolphin-Union (July-Aug)  
 (from Davison & Williams 2014)

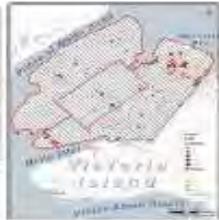
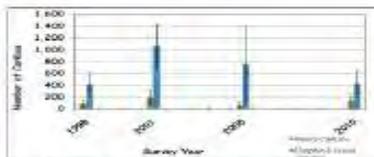


Figure 4. Population trend of non-collared Arctic Peary Caribou (Group A and B) and non-collared Dolphin & Union Caribou (Group C) on NW Victoria Island.

**UUTUQIAKTOK HARVEST STUDY**  
 May 2007 to March 2008

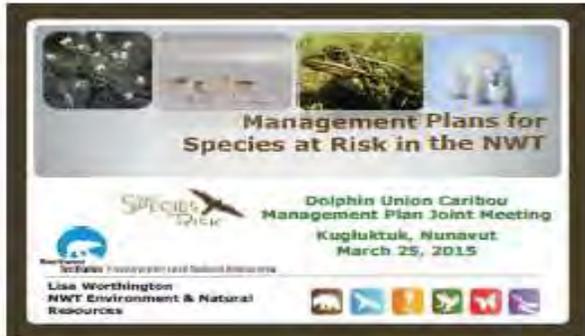
Year	2007	2008	2009	2010	2011	2012	2013
Group A	10	15	20	25	30	35	40
Group B	5	10	15	20	25	30	35
Group C	2	4	6	8	10	12	14

Your Support is essential to the continuation of this study.

- Dolphin-Union Caribou: Summary of Key Threats/Status:  
 (From SARC Report 2013)
1. Declining trend 1997-2007
  2. Population distinct from all others
  3. Vulnerable to environmental change
  4. Mine proposals Bathurst Inlet area
  5. Ship traffic – possible effects on sea-ice
  6. Warmer climate – shorter sea-ice season
  7. Rain and ice on winter range
  8. Harvest estimated 7-11%; may not be sustainable



Photo: E. Toole



**Management Plans for Species at Risk in the NWT**

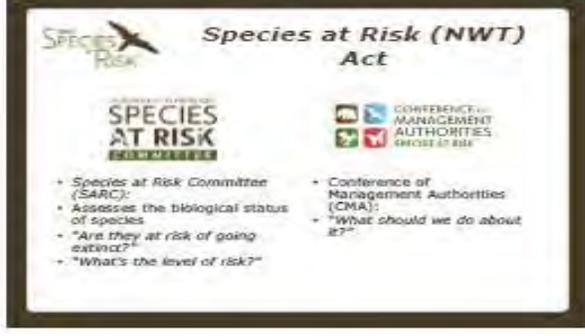
Dolphin Union Caribou Management Plan Joint Meeting  
Kugluktuk, Nunavut  
March 25, 2015

Lisa Worthington  
NWT Environment & Natural Resources



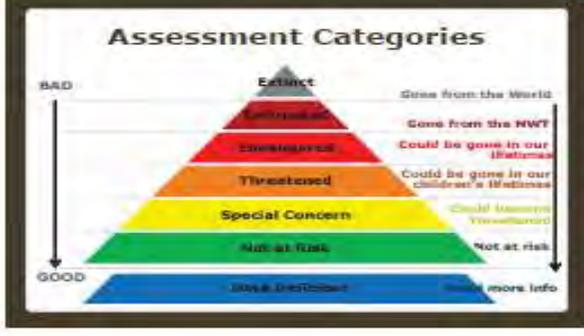
**Species at Risk (NWT) Act**

**Purpose:**  
Find out which species are at risk in the NWT and do something about it.



**Species at Risk (NWT) Act**

- Species at Risk Committee (SARC):
  - Assesses the biological status of species
  - "Are they at risk of going extinct?"
  - "What's the level of risk?"
- Conference of Management Authorities (CMA):
  - "What should we do about it?"



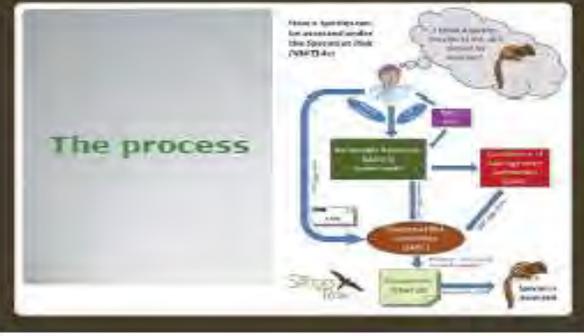
**Assessment Categories**

Pyramid diagram showing risk levels from BAD (top) to GOOD (bottom):

- Extinct:** Gone from the World
- Endangered:** Gone from the NWT
- Threatened:** Could be gone in our lifetimes
- Special Concern:** Could become threatened
- Not at Risk:** Not at risk
- Not Assessed:** Need more info

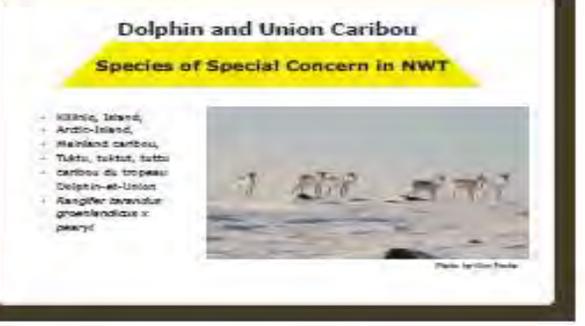


**Adding Species to the NWT List of Species at Risk**



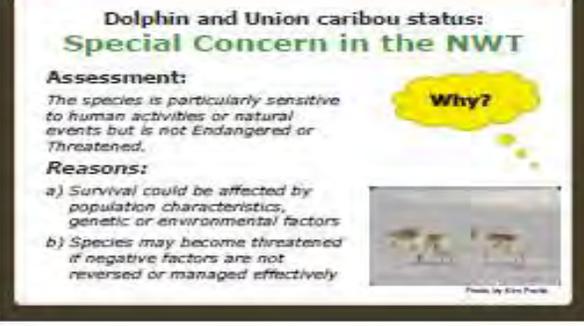
**The process**

Flowchart showing the process from a species being identified to its status being assessed and managed.



**Dolphin and Union Caribou**  
Species of Special Concern in NWT

- Killar, Island
- Arctic Island
- Mainland caribou
- Tuktuk, tuktu, tuktu
- caribou du tro-pesu
- Dolphin-et-Union
- Rangifer tarandus grantlandicus x pearyi



**Dolphin and Union caribou status: Special Concern in the NWT**

**Assessment:**  
The species is particularly sensitive to human activities or natural events but is not Endangered or Threatened.

**Reasons:**

- Survival could be affected by population characteristics, genetic or environmental factors
- Species may become threatened if negative factors are not reversed or managed effectively

**Why?**

## Dolphin and Union caribou status: Special Concern in the NWT

### Main factors:

- Evidence that population declined between 1997-2007
- Vulnerable to warmer temperatures that cause changes in timing of sea-ice formation, changes in thickness of sea-ice, and icing and crusting on fall and winter range.
- Annual harvest is uncertain, but is believed to be 7-11%

Why?



Photo by Sam Cook

## Dolphin and Union caribou status: Special Concern in the NWT

### Other threats:

- Two major mining exploration projects are in dolphin caribou range
- Increase in shipping traffic

Why?

Dolphin and Union caribou may become Threatened or Endangered because of a combination of biological characteristics and threats.



Photo by Sam Cook

## Dolphin and Union Caribou are now on the NWT List of Species at Risk. Now what?



Dolphin and Union Caribou Special Concern in NWT



Photo by Sam Cook

## Dolphin and Union caribou status: Species of Special Concern

- A Management Plan must be developed for the NWT within 2 years of the species listing.
- The WHAC (NWT) and the GNWT will decide on conservation actions that should be taken to manage the species.

Status	Required:	When:
Endangered	Recovery Strategy	Within 1 year
Threatened	Recovery Strategy	Within 2 years
Special Concern	Management Plan	Within 2 years

## What will happen next?

This is where we are now



## Management Planning for NWT Species at Risk

### Dolphin Union Caribou Management Plan

SPECIES AT RISK



## Sections of a GNWT Management Plan

- Part I:**
- Social Perspectives (spiritual and cultural importance)
  - Species Information (Status, Habitat and Biology)
  - Threats and Limiting Factors
  - Factors that may have a positive influence
  - Knowledge gaps
- Part II:**
- Conservation and Recovery/Management of Species
  - Management Goal
  - Management Approaches
  - Actions to achieve these approaches



## Management Plan for the Polar Bear (*Ursus maritimus*) in the Inuvialuit Settlement Region of NWT Proposed Draft May 2015



Photo by Gordon Scott

Species at Risk (NWT) Act Management Plan and Recovery Strategy Series



### Part II: Management Goal for ISR Polar Bear

**Management Goal:**  
The management goal is to maintain healthy viable subpopulations of polar bears in the Inuvialut Settlement Region (ISR) in the near term and in perpetuity, recognizing their cultural importance.

**Management Objectives:**

1. Reduce greenhouse gas emissions and help communities adapt to the impacts of climate change on polar bears.
2. Collect adequate scientific, traditional and historical information in a timely manner to facilitate management decisions.
3. Encourage wise use of polar bear subpopulations and polar bear products.
4. Adaptively co-manage polar bears and their habitat in accordance with all the best information available.
5. Minimize detrimental effects of human activities on polar bears and their habitat.
6. Communicate and share information on polar bears.



### That's why we are here!

**Part II:**

- Overall Management Goal
- Management Objectives
- Approaches to achieve these objectives
- Actions to achieve these approaches



Photo by Glen Wolfe

HTM's mission is to foster Inuit economic, administrative and cultural well-being through the implementation of the Nunavut Land Claims Agreement.

Article 5 – Wildlife

- Importance of implementing Article 5 to promote sustainable harvesting.
- Inuit Qauimajatuqangit



## Land Claim Agreements



Article 5.1.2. (Principles):

- a) Inuit are traditional and current users of wildlife
- a) A long-term, healthy, renewable resource economy is both viable and desirable;
- b) There is a need for an effective system of wildlife management that complements Inuit harvesting rights and priorities, and recognizes Inuit systems of wildlife management that contribute to the conservation of wildlife and protection of wildlife habitat.
- c) There is a need for an effective role for Inuit in all aspects of wildlife management, including research, and
- d) Government retains ultimate responsibility for wildlife management.

Article 5.1.3 – Objectives:

- (b) the creation of a wildlife system that:
  - (i) is governed by, and implements, principles of conservation,
  - (ii) fully acknowledges and reflects the primary role of Inuit in wildlife harvesting,
  - (iii) invites public participation and promotes public confidence particularly amongst Inuit, and
  - (iv) enables and empowers the NWMS to make wildlife decisions pertaining thereto.

Article 5.1.5 – Principles of conservation:

- (i) the maintenance of the natural balance of ecological systems within the Nunavut Settlement Area;
- (ii) the protection of wildlife habitat;
- (iii) the maintenance of vital, healthy, wildlife populations capable of sustaining harvesting needs as defined in this Article; and
- (iv) the restoration and revitalization of depleted populations of wildlife and wildlife habitat.



## Management plans

The NWMB regularly reviews and approves management plans (5.2.34)

- Approve plans for management, classification, protection, restocking or propagation, cultivation or husbandry of particular wildlife, including endangered species
- Southampton Island caribou management plan
- Kivalliq muskox management plan

In progress:

- Polar Bear management plan
- Peary caribou management plan
- Baffin Island caribou management plan

## Hunter and Trapper Organization

Article 5.2.1 - In addition to the functions given to the NWMB, the exercise of harvesting by Inuit shall be overseen by HTOs and TMOs.

The powers and functions of HTOs shall include the following:

- (i) the regulation of harvesting practices and techniques among members, including the use of non-quota limitations;
- (ii) the allocation and enforcement of community basic needs levels and adjusted basic needs levels among members;
- (iii) the assignment to non-members, with or without valuable consideration and conditions, of any portion of community basic needs levels and adjusted basic needs levels; and
- (iv) generally, the management of harvesting among members.








## Federal *Species at Risk Act (SARA)* and Dolphin and Union Caribou Management Plan

### Recovery and conservation of species in Canada

- In the north, wildlife conservation/management is already practiced by the wildlife management boards, hunters and trappers committees/organizations, and governments
- The *Species at Risk Act* is another conservation tool for species that may be at risk of declining or disappearing
- Provides a nationally-consistent strategic framework for conservation of species across Canada
  - Species are not confined by provincial/territorial borders
  - Provides a national standard for consistency in protection
  - Management can be coordinated across the species' entire range

Page 1 March 2011, 2011

### Roles and Responsibilities: Federal Role

**Federal:**

- Environment Canada - *Species at Risk Act (SARA)*
- Parks Canada - *National Parks Act*
- The federal government is responsible for implementing the federal *Species at Risk Act (SARA)*

**Territorial:**

- Co-management of species
  - In general
  - As a SARA-listed species
- Territorial legislation (*Species at Risk (NWT) Act, NWT Wildlife Act, NU Wildlife Act*)

Page 2 March 2011, 2011

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

**Purpose**

- Prevent wildlife from becoming extirpated or extinct in Canada
- Provide for the recovery of extirpated, endangered or threatened species as a result of human activity
- Manage special concern species to prevent them from becoming further at risk



Page 3 March 2011, 2011

### The *Species at Risk Act* and the Wildlife Management Boards

- The *Species at Risk Act* requires consultation with the wildlife management boards before any decisions affecting Aboriginal people can be made
  - Listing of species
  - Application of prohibitions
  - Recovery strategies, action plans and management plans
  - Regulations for action plans and management plans
  - Critical habitat
  - Permits

Page 4 March 2011, 2011

### Essential role of Aboriginal Peoples

- The *Species at Risk Act* recognizes that the roles of Aboriginal peoples and Wildlife Management Boards established under land claims agreements in the conservation of wildlife in Canada are essential
- The Act requires:
  - **Consideration of traditional knowledge** in assessment, planning and implementation
  - **Cooperation** with directly affected Aboriginal organizations and Wildlife Management Boards when preparing recovery documents
  - **Consultation** with directly affected persons before making decisions that may impact them



Page 5 March 2011, 2011

### Species at Risk Act



Page 6 March 2011, 2011

### Recovery and management planning



Page 8 March 2011, 2011

## Dolphin and Union Caribou and the federal *Species at Risk Act* Process



## What are the implications of Special Concern listing?

- Measures to ensure species does not become threatened or endangered.
- Management plan must be prepared within 3 years of the date of listing.
- Written in cooperation with Aboriginal organizations and Wildlife Management Boards.
- General prohibitions under SARA do not apply to species of Special Concern
- No critical habitat identification

Page 10 March 2017 2017

## What is a Management Plan?

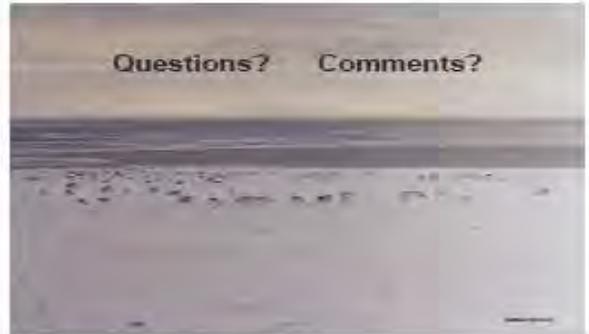
A planning document that:

- Describes the species and its needs
- Lists the threats to the species and its habitat
- Sets management objectives
- Suggests broad strategies and conservation measures
- Describes ways to measure progress



Page 11 March 2017 2017

Questions? Comments?



# **Dolphin and Union Caribou Second Joint Meeting Report**

Cambridge Bay, January 11 - 13, 2016



Department of Environment, Government of Nunavut  
Iqaluit, Nunavut

## Executive Summary

A workshop focusing on Dolphin and Union Caribou took place in Cambridge Bay between January 11 and 13, 2016. During this workshop, the Government of Nunavut, Department of Environment (DOE), Government of Northwest Territories (GNWT), Environment and Climate Change Canada (ECCC), NTI, and the Kitikmeot Wildlife Regional Board (KRWB) representatives conducted consultations with the Hunters and Trappers Organizations from Nunavut and Northwest Territories. The primary purpose of the workshop was to provide co-management partners with an update on progress on the draft Dolphin and Union Caribou Management Plan, and to seek further input and knowledge to help complete the draft plan.

The review of efforts on the management plan was followed by discussions on a pathway forward with the intent of developing a draft management plan suitable for community consultation. The meeting format was a series of presentations on herd status, reviews of the draft outline, framework, threats, and potential harvest management options, followed by questions and comments. The meeting was an open exchange of knowledge, both scientific and traditional and local.

Presentations on herd status and reports on research projects provided up to date knowledge for participants to start their discussions. The discussions on threats and actions to mitigate those threats will help further develop the management plan. A discussion on harvest management options will be used to define what recommended actions should be taken as caribou move through their natural population cycle. Finally a process and timeline were identified for the co-management partners to advance the management plan through each respective process.

This report attempts to summarize the comments made by participants during the workshop. A full record of the workshop is available in the minutes.

## **Preface**

This report represents the Dolphin and Union Caribou working group's best efforts to accurately capture and translate all of the information that was shared during workshop.

The views expressed herein do not necessarily reflect those of one specific organization, but rather, the best advice and opinions from the participants.

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## 1.0 Summary Purpose

This summary is intended to collate and summarize comments, questions, concerns, and suggestions rose during the joint meeting held with representatives from the co-management partners from the Northwest Territories, Nunavut, and Environment and Climate Change Canada. The summary and notes herein only reflect what was shared during the meeting.

## 2.0 Purpose of the Workshop

The primary purpose of the workshop was to engage co-management partners from Nunavut, the Northwest Territories, and Environment and Climate Change Canada in an ongoing dialogue on Dolphin and Union caribou. It also allowed management partners to continue, based on the 2015 Kugluktuk meeting, directing the development of a multi-jurisdictional management plan for the Dolphin and Union caribou herd. Review of efforts to date was followed by discussions on a pathway forward with the intent of developing a draft management plan suitable for community consultation.

### 2.1 Format of Meetings

The meetings were held during three days (January 11, 12, and 13 2016) in Cambridge Bay at the Arctic Islands Lodge meeting room. Meetings were co-chaired by Joanna Wilson, Species at Risk Biologist with GNWT, and Mathieu Dumond, Regional Manager, DOE. The meeting format was a series of presentations on herd status, management process, reviews of the draft outline, framework and threats, and potential harvest management actions (presentations are in Appendix 2), followed by questions and comments. The meeting was an open exchange of knowledge, both scientific and traditional.

### 2.2 Meeting Participants

Name	Community	Organization
Simon Qingnaqtug	Taloyoak	Kitikmeot Region Wildlife Board
Ema Qaqqutaq	Kugaaruk	Kitikmeot Region Wildlife Board
Jimmy Haniliak	Cambridge Bay	Cambridge Bay Hunters & Trappers Organization
John Lucas Jr.	Tuktoyaktuk	Wildlife Advisory Management Council (NWT)
Joe Ilisiak	Paulatuk	Inuvialuit Game Council/ Paulatuk HTC
Joshua Oliktoak	Ulukhaktuk	Inuvialuit Game Council/ Ulukhaktuk HTC
Larry Adjun	Kugluktuk	Kugluktuk Hunters & Trappers Organization
Joanna Wilson Co-Chair	Yellowknife	Government of Northwest Territories (GNWT)
Lisa Worthington	Yellowknife	Government of Northwest Territories (GNWT)
Tracy Davison	Inuvik	Government of Northwest Territories (GNWT)
Sam Kapolak	Bay Chimo	Bay Chimo Hunters & Trappers Organization
Bert Dean	Rankin Inlet	Nunavut Tunngavik Inc. (NTI)
Lisa-Marie Leclerc	Kugluktuk	Government of Nunavut (GN)
Drikus Gissing	Iqaluit	Government of Nunavut (GN)
Mathieu Dumond Co-Chair	Kugluktuk	Government of Nunavut (GN)
Amy Ganton	Yellowknife	Canadian Wildlife Service (CWS)

## **3.0 Workshop Summary**

The goals of the meeting were made clear to the participants prior to the meeting as well as at the start of it (See Appendix 1 Agenda). Participants actively engaged in many discussions that were preceded by a presentation. Participants raised many similar questions, concerns, and suggestions in addition to providing direct feedback to draft the management plan. The workshop maintained a positive tone throughout and many participants commented on the need to work together to find solutions to assure caribou conservation.

### **3.1 Review of Outcomes from the March 2015 workshop**

A review of what was accomplished at the March 2015 workshop was provided as some participants were new to the process. The draft goals and objectives and the threats were revisited. A teleconference in October 2015 had already reviewed potential harvest management models to be discussed during this workshop.

#### **3.2.1 GN Knowledge Update and Background and Species Information**

An update of the DOE April 2015 collaring and the October 2015 survey was provided. The analysis is not completed, but the preliminary results revealed 14,730 (CI= 11,475-17,986) in the visual stratum. A presentation on the biology of the species, the history of research and monitoring, and the current and historical use of the herd were provided as a review of what will be comprised in the future sections 3 and 4 of the management plan.

Participants focused discussion on the historical and current use of the herd including accuracy of the original Nunavut Harvest Study, which only grouped caribou harvest and did not differentiate between herds. Most co-member partners felt that the record was accurate for their respective communities; however more effort is required to determine current harvest rates. This was discussed in terms of potential HTO/HTC based community monitoring, efforts at the second Nunavut Harvest Study, and the requirement under Section 5.7.43 of the NLCA to provide information. Additional discussion on harvest included the situation when one herd becomes scarce; it often results in another herd being targeted for harvest. This has been the case when Peary caribou is low, and the Dolphin and Union caribou is targeted in Ulukhaktuk, and when Bluenose East herd becomes low, the Dolphin and Union caribou is targeted in Kugluktuk. Both communities have increased their harvest of Dolphin and Union caribou in response to decreases in access or availability of other herds.

General support of harvest monitoring, as well as increased cooperation with industry to incorporate voluntary best practices, and reduced flying during calving summarized participant concerns.

#### **3.2.2 Traditional Knowledge Research**

The results of Traditional Knowledge collection were presented. The study took place in 2014 and 2015 in Cambridge Bay. Thirty individual interviews were conducted in the summer of 2014 and 7 group interviews in the winter of 2014. There were follow up interviews to validate the results of the 2014 interviews in the summer of 2015. The results provided excellent examples of quantification of oral knowledge depicting the caribou population recovering from a low in the 1960's to a peak in the late 1990's to the current decline being observed today using scientific methods.

In addition to describing population trend, key findings of scientific research conducted in October 2015, included: observation of poorer caribou body condition status since the decline, increased observations of caribou with abnormalities since the decline, and observation of diseases that might be new to the area.. The study participants' perceptions of factors that may have contributed to the decline of caribou in the area include; change in migratory routes (more to the east and west side), an increase in predators, deterioration of health status, human disturbance, and a change in climatic conditions that can have a direct or indirect effect on caribou populations.

Questions on the potential effects of climate change included an increase in new insects and new diseases. Although this was noted in the interviews, additional research is required. Additionally participants were interested to know if the interviews indicated an increasing muskoxen population and the potential impacts of increased competition between the two species. Although not an interview question, it was a recurring response.

Significant discussion was focused on the impacts of late season shipping that disrupts the fall migration and can lead to drowning. It also delays the caribou's staging time on the ice, leading to poor nutritional status. Potential mechanisms to try and implement a *no shipping* period during freeze up were discussed, but the situation is complex and managed by the federal government since international shipping takes place in these waters. More work needs to be directed to pursue the appropriate avenues with the federal government: in this case, Transport Canada. Voluntary agreements with industry to support no shipping during this period are already in place and could be pursued with additional companies.

Additional discussion focused on other community concerns from participants including; an increase in insect harassment associated with climate change and low flying aircraft and its impact (particularly on calving). Other concerns included increasing marine traffic (cruise ships and their passengers), an increase in grizzly bears, and the need for increased predator harvest to help caribou.

### **3.2.3 GNWT Traditional Knowledge Study**

Traditional knowledge interviews were conducted in Ulukhaktuk from 2011 to 2013. The interviews highlighted threats to caribou and included human actions, such as low flying aircraft, development, predation, competition from muskox, and effects from climate change including more freezing rain, thin ice leading to drowning, and dryer weather negatively impacting vegetation.

### **3.2.4 Health and Disease**

Samples taken from 25 Dolphin and Union caribou collared in April 2015 were blood, hair, and fecal samples for analysis. Feces were examined for parasites and results were mostly normal. One unusual finding is the existence of *Parelaphostrongylus andersoni*; this is the first report of this parasite found in Dolphin and Union caribou.

Lungworm was found in the feces. This worm was not historically found on Victoria Island, but as of 2010, it seems to have spread over the Island and appears to be increasing. The level at which this parasite is occurring in caribou does not appear to be a concern at this time.

The bacteria *Erysipelothrix rhusiopathiae* is present in Dolphin and Union caribou. It has caused die-offs in muskox. The prevalence of these bacteria should be monitored, as it may be a causal in the caribou decline. This is transferable to humans and therefore a human health concern.

Newly developed methods for determining stress levels from hair samples (cortisol levels) were performed. Preliminary results indicate that Dolphin and Union caribou had higher stress levels in spring 2015 compared to two other barren-ground herds and one woodland caribou herd. The study of stress is new and although it may be supportive of the decline it is too early to tell. However, it may become a useful tool to monitor stress level in caribou herds.

Concerns from participants on potential human health impacts from animals were discussed. Lungworm does not transmit to humans, but the bacteria *Erysipelothrix rhusiopathiae* does as well as Brucellosis. There are concerns over increasing snow goose populations and the potential for them to be a vector for new and increasing diseases. Birds and small animals can act as vectors, and can explain muskox die-off on Banks Island. Samples of 600 snow geese and rodent samples were taken, and it seems the bacteria were present in these animals

### **3.2.5 Toxicology**

As part of the long term Northern Contaminants Monitoring Program caribou are tested for contaminants such as mercury, cadmium, radioactivity, brominated, and fluorinated compounds. The majority of these contaminants are transported through air currents from elsewhere and deposited on vegetation and ingested by caribou. Levels at this time do not pose a threat to human health from consuming caribou. Long-term monitoring is important to monitor the concentration of these contaminants in the animal.

Most questions were on human health impacts from consumption of caribou. However current standards indicate that the thresholds are below any level of consumption for meat.

## **3.3 Overview of Draft Table of Contents**

The current version of the draft Table of Contents was reviewed for accuracy and completeness. Although many of the sections are yet to be drafted, participants felt that the current content of the management plan adequately covers all the information needs.

## **3.4 Threats and the COSEWIC Threat Assessment**

After a review of the threats drafted for the management plan, participants concluded that the draft accurately reflects what was discussed at the first joint meeting in March 2015. Additional discussion on threats focused on the need for more research to address the impacts of climate change including: how climate change may impact forage quality and quantity, the time of green up in the spring, increase in new insects and diseases. Several participants identified a need to improve education on caribou both by the schools and within the family. There was one participant who felt a quota should be implemented to ensure the declines are not as severe as what is being experienced in Baffin Island. However another participant countered that this should be through HTOs/HTCs as opposed to through the formal decision-making process.

A presentation on the requirements under the *Species at Risk Act* for management plans and how the Threat Assessment Calculator is used to address those requirements was given. The threats calculator is a tool to enumerate and quantify each threat; to rank what threats are a big issues and what may only be a potential threat. The focus is on direct threats that either cause decline, (such as mortality or removal of habitat), or affect reproduction. Threats are scored and tracked, so they are not considered twice, which would skew the overall rating of the threats. The calculator is a complex, but useful tool. A teleconference is to be scheduled as a follow up to complete this agenda item.

### 3.5 The Management Framework

The management framework consists of the goal of the management plan (still in draft form) and the objectives to reach that goal. There are additional approaches identified to achieve each objective. This approach will ensure that objectives are met and through meeting the objectives, the goal(s) will be met.

Discussions on the current version of the management framework indicated that this section was mostly completed. These groups suggested to include current actions that involve working with industry to establish voluntary agreements on shipping and flying. They also suggested coordinating monitoring with industry, examining what mechanisms can move shipping concerns forward, the role that marine protected areas might play in protecting the sea ice component of the migration route, and specific actions to contact federal departments regarding the impacts of ice breaking activities.

### 3.6 Harvest Management Options

Three different options were presented as potential models for harvest management; these included the Bluenose Model, the Porcupine Model, and the Southampton Island Model. They are all similar in that they described actions related to distinct sections of a caribou population cycle. For example, if the herd is at its peak and stable, the herd would be assessed as green; a herd that is showing a decline would be assessed as yellow; and a herd at low would be assessed as red. Each of these would have prescribed management recommendations reflecting the respective conservation issues. A herd in the green would have few harvest restrictions, while a herd in yellow may see the removal of sport hunts, while a herd in red may see strict harvest limitations.

Considerable discussions resulted from these options. An exercise was performed to determine what thresholds should trigger each of these categories, and what the recommendations should be. The results (photos in appendix 2) will be used to inform the propose harvest management framework in the next draft management plan. Suggested thresholds for herd triggers between levels green, yellow and red are: 24,000 to 40,000 is high (green); 8,000 to 24,000 is medium (yellow); and below 8,000 is low (red). Within these ranges the population can be increasing, decreasing or stable. A point form summary of participant thoughts on appropriate recommendations during the various stages of the herd cycle follow below.

#### **Herd is at Peak-Green Level**

- Provide harvester and youth education when population is high, don't wait for the population to decline
- No Harvest restrictions on beneficiaries,
- Support reporting at the HTO/HTC level (community-based monitoring.),
- Ensure any changes are phased in,
- Allow community to determine if action should be taken,
- Commercial harvest may be a tool to bring down an overpopulation (i.e. Southampton Island caribou),
- Predator control, encourage harvest of predators by paying for samples.

#### **Herd is in Yellow-Declining**

- Increased monitoring and sharing of information,
- Harvest Management,

- Sample kits (help ID decline),
- Stop commercial/sport hunts,
- Restrict industry activities on land,
- NQL-bull only,
- Education; how to hunt alternate wildlife, use elders,
- Increase communications between stakeholders,
- Create a working group of stakeholders or commission,
- Periodic review of the state of knowledge

#### **Herd is in Yellow-Increasing**

- Easing of industry restrictions,
- Easing of harvest restrictions,
- Education,
- Return to baseline monitoring,
- Easing of Non-Quota Limitations (NQLs).

#### **Herd is in Red**

- Increase monitoring, more frequent surveys,
- Setting TAH,
- Harvest from other caribou herds (if appropriate),
- Education; tell people to stop harvest and explain why there are restrictions,
- Harvest seasons.

### **3.7 Summary of Issues and Actions**

The discussions were open and diverse, and some general themes were consistent throughout. Although a quantitative summary was not conducted, it is possible to summarize the key themes that were recurrent throughout the discussions, these are summarized below.

#### **3.7.1 Summary of Key Concerns**

- Predation from wolves and grizzly bears and their impacts on caribou number, particularly during calving,
- The number of flights, particularly low level flights during calving,
- The effects of climate change particularly on increasing insect harassment and potential impacts on forage quantity and quality,
- Increased shipping during the fall migration and potential for drowning,

#### **3.7.2 Summary of Key Actions**

- Work with industry to voluntarily implement best management practices,
- Pursue avenues for stopping shipping during the key migration; fall and spring,
- Increase education for harvesters in terms of caribou harvesting and how to harvest other species,
- Improve harvest monitoring,
- HTOs/HTCs to implement community-based quotas and monitoring were appropriate,
- Increased predator harvest through incentives and/or increased sport hunts.

## 4.0 Next Steps

The following text defines the proposed next steps and timeline to see the draft management plan through the respective territorial and federal processes.

### **2016-2018 Timelines for Dolphin and Union caribou management plan**

*As presented at joint management planning meeting, Cambridge Bay, January 13, 2016*

- Finish drafting plan using input from this Cambridge Bay meeting (GN, GNWT & EC technical staff & managers)
- Teleconference organized by EC to work on COSEWIC threat assessment table (end of January)
- Draft plan and accompanying presentation to be provided to WMAC(NWT) for March 13-15, 2016 meeting - this would be the version to go out for community consultations
- April 2016
  - Consultation meetings held in individual communities, with HTC/HTOs
  - Review of draft by GNWT, GN, PC, WMAC (NWT), KRWB, NTI, KIA, IGC (“first jurisdictional review”) and by EC headquarters (“first compliance review”)
- GN, GNWT & EC technical staff & managers to edit the plan based on all those comments – edits to be done jointly
- September 2016
  - Revised draft plan reviewed by GNWT, GN, PC, WMAC (NWT), KRWB, NTI, KIA, IGC (“second jurisdictional review”, asking for support to post on SARA registry)
- GN, GNWT & EC technical staff to edit the plan based on all those comments – edits to be done jointly
- By mid-January 2017, EC to send proposed draft plan for translation into French – proposed draft ready for posting on SARA registry
- March 31, 2017 (hard deadline)
  - Draft plan posted as ‘proposed’ on the SARA public registry for 60 day public review
  - Draft plan posted by GNWT for public review
  - All partners including HTO/HTCs to be notified of opportunity to comment
  - If posted on March 31, comment period would end May 30
- GN, GNWT & EC technical staff & managers to edit the plan based on all those comments – edits to be done jointly
- Final management plan completed by August 2017
- Package submitted to NWMB by mid-August 2017 (may be joint submission by GN & EC)
- NWMB to consider the management plan at September 2017 meeting, followed by their hearings if needed
- Plan submitted to WMAC (NWT) for approval at their September 2017 meeting
- GN, GNWT & EC to seek Minister approval of the plan
- Response from NWMB by December 2017 – whether or not they approve the plan
- NWT Conference of Management Authorities consensus agreement by December 2017
- Management plan completed, approved and made public by March 31, 2018

Abbreviations:

ECCC = Environment and Climate Change Canada

GN = Government of Nunavut

GNWT = Government of the Northwest Territories

HTC = Hunters and Trappers Committee

HTO = Hunters and Trappers Organization

IGC = Inuvialuit Game Council

KIA = Kitikmeot Inuit Association

KRWB = Kitikmeot Regional Wildlife Board

NTI = Nunavut Tunngavik Inc

NWMB = Nunavut Wildlife Management Board

PC = Parks Canada

WMAC (NWT) = Wildlife Management Advisory Council (Northwest Territories)

## Appendix 1 - Agenda

### Dolphin and Union Caribou Joint Management Plan Workshop

Cambridge Bay, Nunavut

January 10 – 13th, 2016

#### Meeting Information

##### Goals of the Meeting:

- Integrate community perspectives (IQ/TEK) with scientific knowledge throughout the meeting
- Review and discuss the first draft of the Dolphin and Union Caribou Management Plan
- Review and collect feedback on key sections of management plan: species needs, threats, management objectives and approaches, including inclusion of IQ/TEK information.
- Discuss options for harvest management model and corresponding actions
- Review new knowledge and current research

##### Schedule:

- Arrival in Cambridge Bay: Sunday, January 10<sup>th</sup> in the afternoon. Grocery store may be closed by 5:00 so get groceries (if needed) before coming to the meeting room.
- Meeting:
  - o Sunday – lunch served in meeting room (catered), meeting 3:00 pm to 4:30 pm
  - o Monday & Tuesday - 9:00 am to 5:00 pm with health breaks and lunch (catered)
  - o Wednesday – 9:00 to 4:00 pm with health breaks and lunch (catered)
- Breakfast and dinners will be on your own. Green Row is open for dinner 5:00-7:00 p.m. and Arctic Islands Lodge is open for dinner from 5:00-6:45 p.m. Breakfast is available at the Green Row.
- Departure from Cambridge Bay: Wednesday, January 13<sup>th</sup> in the evening (6:00 pm flight)

Meeting Location: Arctic Islands Lodge, medium boardroom

Accommodation: Green Row Executive Suites (transportation will be provided to and from the airport)

# Dolphin and Union Caribou Joint Management Plan Workshop

Cambridge Bay, Nunavut  
January 10 – 13th, 2016

## Agenda

### Sunday January 10<sup>th</sup>, 3:00 p.m. – 4:30 p.m.

1. Welcome	Co-chairs – Joanna Wilson and Mathieu Dumond
2. Opening Prayer	
3. Opening Remarks	Co-chairs
4. Introductions	All participants
5. Outcomes/Expectations for meeting	All participants
6. Review of Outcomes from March 2015 meeting in Kugluktuk	Lisa Worthington

### Monday January 11<sup>th</sup>, 8:45 a.m. – 12:00 p.m.

7. Knowledge and Research Update	
7.1. GN update	Lisa-Marie Leclerc
7.2. GNWT update	Tracy Davison Matilde Tomaselli
7.3. Traditional Knowledge Research	Tracy Davison
7.4. NWT Traditional Knowledge Study (tentative)	Susan Kutz
7.5. Health and Disease	Mary Gamberg

### Monday January 11<sup>th</sup>, 1:00 p.m. – 5:00 p.m.

8. Review of Draft Management Plan - Background Information on Dolphin and Union caribou	All participants (lead presenter below)
8.1 Overview of draft table of contents	Lisa Worthington
8.2 Background & Species Information	Lisa-Marie Leclerc
- Historical & social perspectives	
- Use of the herd	
- Population and Distribution	

9. Review of Draft Management Plan – Threats to Dolphin and Union caribou	All participants (lead presenter below)
9.1. Threats in draft management plan	Lisa Worthington (with technical support from Lisa-Marie Leclerc and Tracy Davison)

**Tuesday January 12<sup>th</sup>, 8:45 a.m. – 12:00 p.m.**

9. Review of Draft Management Plan – Threats to Dolphin and Union caribou ( <i>continued</i> )	All participants (lead presenter below)
9.2. Threat assessment by COSEWIC	Amy Ganton / Justina Ray
10. Review of Draft Management Plan – Management Framework	All participants (lead presenter below)
10.1. How the framework links to management plan	Lisa Worthington
10.2. Management goal/vision & objectives	Lisa Worthington

**Tuesday January 12<sup>th</sup>, 1:00 p.m. – 5:00 p.m.**

10. Review of Draft Management Plan – Management Framework ( <i>continued</i> )	All participants (lead presenter below)
10.3. Recommended management approaches & actions to achieve objectives	Lisa Worthington

**Wednesday January 13<sup>th</sup>, 8:45 a.m. – 4:00 p.m. (all day)**

11. Options for Consideration of Harvest Management	All participants (led by Lisa-Marie Leclerc)
11.1. Decision on harvest management models	
11.2. Management recommendations	
12. Next Steps	Co-chairs
13. Closing Remarks	All participants
14. Closing Prayer	

# Appendix 2 - Presentations



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## Dolphin and Union Abundance and Distribution

Lisa-Marie Leclerc



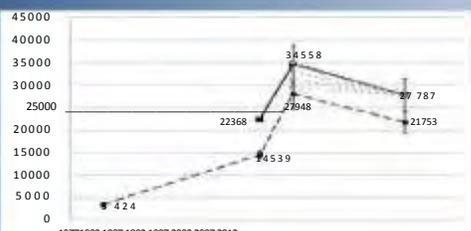
### 2015 Population and Distribution

- Dolphin and Union caribou are intermediate in size and color between Peary caribou and Barren-ground caribou.
- Dolphin and Union caribou is the most genetically differentiated of the barren-ground caribou (Zittlau, 2004) possibly due to genetic bottleneck.
- Special behaviors:**
  - They do not form well define calving ground, as its calving strategy is mainly individualist (Nagy et al., 2011).
  - Migratory herd crossing the sea-ice to reach their wintering and summering ground.

(Dumond and Lee, 2013)



### 4.4 Population and Distribution



Map of final systematic reconnaissance flights on October 25 (East of Cambridge Bay) and October 31 (West of Cambridge Bay) and second

(Dumond and Lee, 2013)



### 4.4 Population and Distribution





### 4.4 Population and Distribution

The resulting estimate of caribou of 14,730 (CI= 11,475-17,986).




### 2015 Survey



## Ulukhaktok Traditional Knowledge Interviews 2011-2013



## Humans Activities

- Five people mentioned human activities as a threat.



## Predators



- Everyone Mentioned Predators as a threat to Caribou.
- They kill caribou, kill calves and also some are
- Both Wolves and Grizzly Bears
- People also concerned about their own safety because of increase in Wolves and Grizzly Bears

## Threats

“When they do exploration they always fly around and when they see animal they turn around, fly low and take pictures. That’s when the caribou start running away.” – PIN02

“Any place where there are machines or planes start travelling every day or every second day and that they could easily move from that spot. Because from they come in start making noise they spook them off. Interrupt whatever they’re doing.” – PIN07

“When they work on the land, like, they’re drilling, the smell of smoke, the sound of the drills, the sounds of vehicles, maybe people, the smells of those drives the caribou away and that’s a threat to caribou. So they go somewhere else to where it can be at peace.” – PIN11

“Even now the wolves are still following the caribou. Everywhere they go they follow caribou. Not only the wolves, even so the Grizzly Bears are killing them. Right now there’s more Grizzly Bears that have been spotted.” –PIN07

“All because of the wolf, the wolf make eight pups and caribou make one pup. One caribou calf. That’s a big difference there. So like I said, that’s how come it’s really hard to see a female caribou with a calf. Females have lots of milk because it’s already been chased by the wolves and it’s really easy to be spooked now.” –PIN07



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## Thin Ice

- Four people mentioned hearing about or seeing caribou going through thin ice, mostly in the fall time during freeze up.

“ You know when they go through the ice and drown. That’s another one.” –PIN01

“It doesn’t freeze fast anymore and the ice doesn’t get solid fast like it used to. When it used to freeze we used to just start walking on it the next day. On the ocean.” - Pin07

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## Freezing Rain

- Eight people mentioned Freezing Rain – or Rain on snow making a layer of ice on the ground.
- Some people recorded that it happened in the past. Other People noticed it happening more now than in the past, but one person notices it happening the same as in the past.

“Got snow now and then rain and then freeze again then it’s going to be hard for them for feeding.”– Pin07

“They can’t paw through the ice when it’s thick.” – PIN10

“Caribou, no matter what weather, they will graze but when the snow gets covered over with ice they find a lot of dead caribou. Because they can’t go pawing through that ice that’s on top of the snow.” – PIN04

“If you got a lot of storm. You know, some years winter time it could storm for many days. If there’s too much storm and it wells up a little bit then they get cold and iced up and all that, they get cold and they get stuck to the place where they’re sleeping, where they’re laying down. From the climate or whatever the weather changes fast sometimes. We’ve seen a couple of those do like that. Just laying there, dead from bad weather and all that. Sometimes it takes a long time to get nice out. Must be probably not the healthy ones, that’s why.” –PIN07

“Yeah, when it’s too much wind and cold weather and stuff like that, I guess, you know. Big storm. Got to be a big storm when they die like that. I could notice, I look at them, no blood, nothing, not even the blood every one of them they just freeze like that staying down.” PIN08

Caribou can die from weather events like freezing rain but they also have ways to deal with winter weather in the Arctic and extreme conditions.

- Caribou stay still during a storm , they will also move to different areas if the snow is bad or there is ice in an area.

- Three people mentioned they will fatten up for winter.

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They know the weather, they know the seas, so they know when to come to these high areas where they can get out of the storm. – PIN04

“Winter time I think they just lay down, hunker down and wait for the weather.” - PIN03

He said in the fall time if we get snow and then rain the caribou leave that area and go somewhere else. They don't hang around in that area where they would have stayed. Due to weather, ice conditions on top of the snow, they will not stay. - Pin06

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## Health

Sickness isn't very common, some participants had never seen illness in caribou other participants saw the occasional sickness. Most common observation was issues with joints, or legs.

Caribou do get skinny during winter, but they get fat again in the spring and summer.

Like in the winter, like all animals they what you call try and eat as much as they can for the winter months so that they grow a layer of fat to keep them warm so that on days like this they know that they can't be roaming around hunting and that. - PIN01

She said in the winter there was one time when she noticed and first when she seen it there was an area, a grazing area. Her, really deep snow, the caribou just kept pawing at the ground until they could reach to the ground, to the growth under. - PIN10

“Just a couple since I started hunting. One that gets way left behind, that they have a cyst or something in their legs. Liquid. They run for a while and then they can't run anymore. “ - PIN03

When she was hunting she used to travel and she used to never hear of caribou getting sick. – PIN11

## How know Caribou are doing well?

Three people commented on how to tell if caribou are doing well.

Things people look for is :

- If hunters are successful
- If the land/plants grown good
- See caribou coming in the spring.

## Changes in the number Caribou

Almost everyone saw changes in number of caribou over their life.

There were times when there were less caribou in the past, in the 1970's and 1980's there were a lot of caribou then seem to decrease.

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Reasons for the change was similar to the threats however it is also a natural cycle for animals.

Some people also talked about how caribou have moved away, and they will come back

It might deplete because there's so many things that come into consideration like the weather and the plants that grow and things that happen to the Earth and all those things that you mentioned come into what you call play on the survival of the caribou. – PIN01

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## Conservation

- **Most people mentioned changing harvesting – taking less or not taking Peary Caribou (smaller caribou). One participant mentioned getting muskox instead of caribou and another mentioned not hunting cows with calves.**

## Habitat

Caribou like low areas, where it is damp and there is good plant growth. Most participants said this is where you would find them in summer but 2 participate also said you could find them here in winter.

Two participants also mentioned that caribou like shores in the summertime.

In winter most participates though caribou choice areas with less snow; high areas.

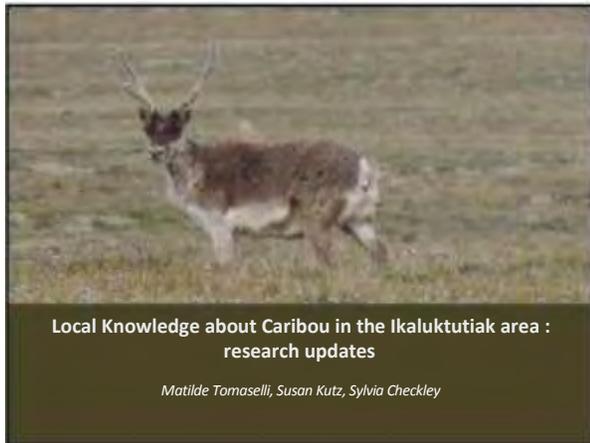
Two participants mentioned rocks; one thought they used rocks to get away from wolves.

## What Caribou Eat

- Things caribou eat include:
  - Tuktut niqait
  - Lichen
  - Arctic Sorrel
  - Grass
  - Berries

To me their stomach is very green in the summer. –PIN06





2 **Study design**

☐ **SUMMER, 2014 30 INDIVIDUAL** Identified with help of KIA and HTO

- 23 Beneficiaries
- 5 Residents

Specific questions - muskox population

Open questions - emergence of other themes

3 **Study design**

☐ **WINTER, 2014 7 SMALL GROUP INTERVIEWS**

Total of 19 participants

11 from individual interviews

Group according to: age, hunting experience, hunting area of preference

Specific participatory activities

probe observations from the individual interviews

4 **Study design**

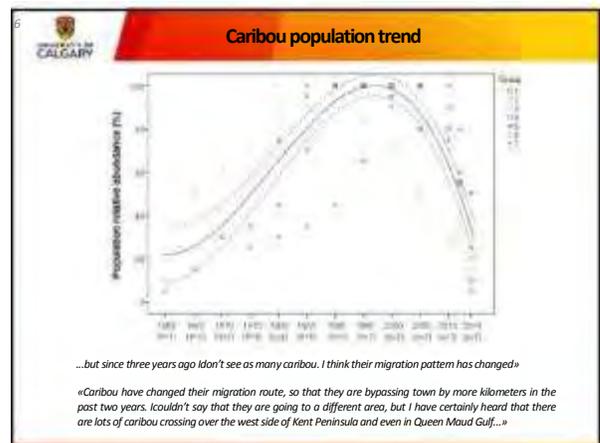
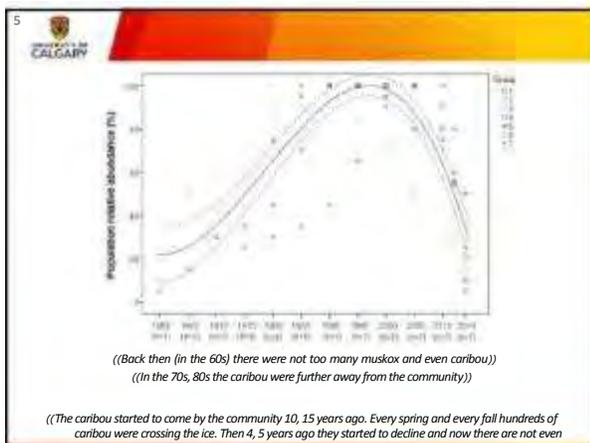
☐ **SUMMER, 2015 VALIDATION OF THE RESULTS**

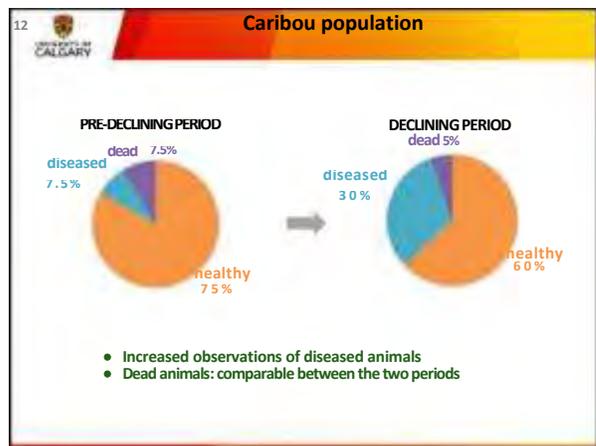
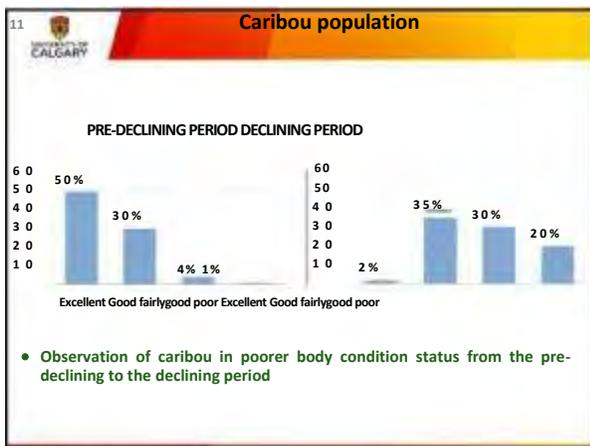
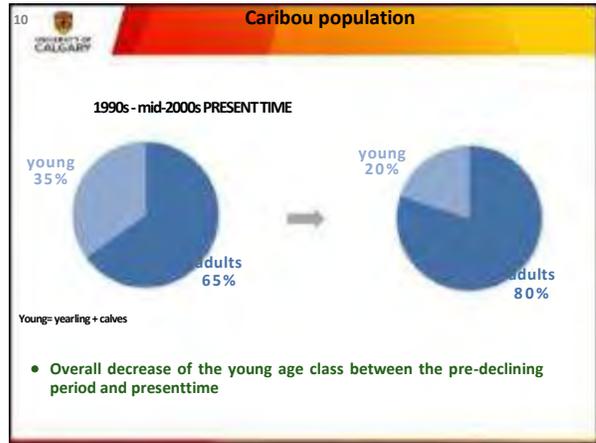
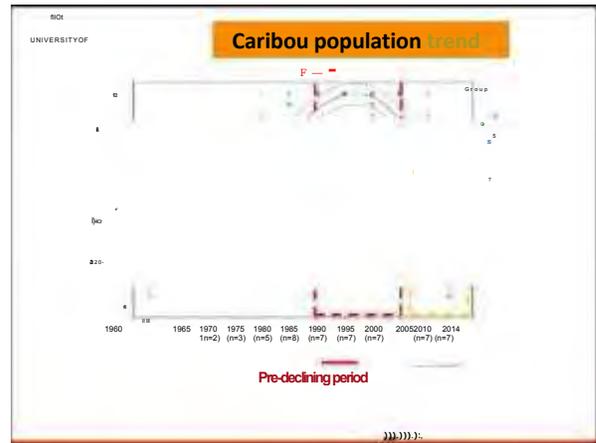
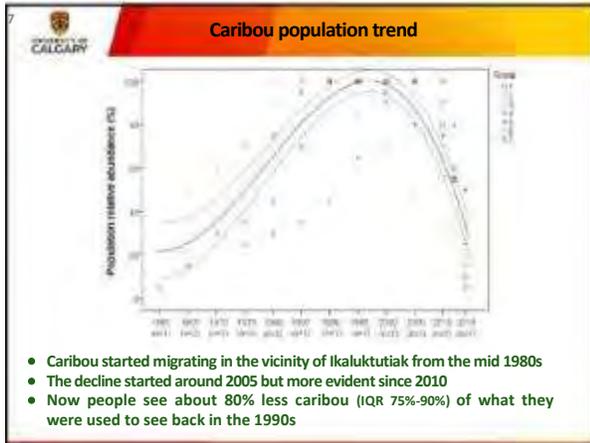
After data analyses

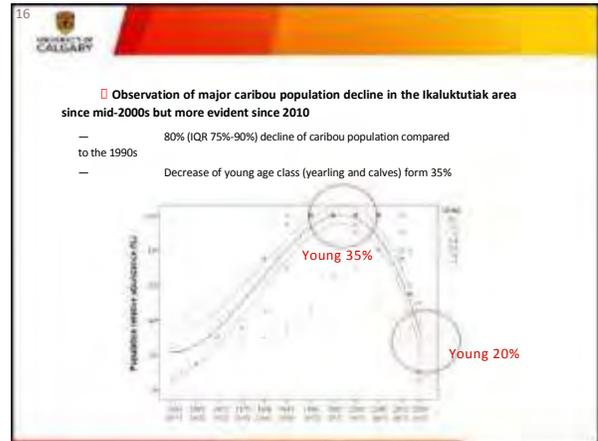
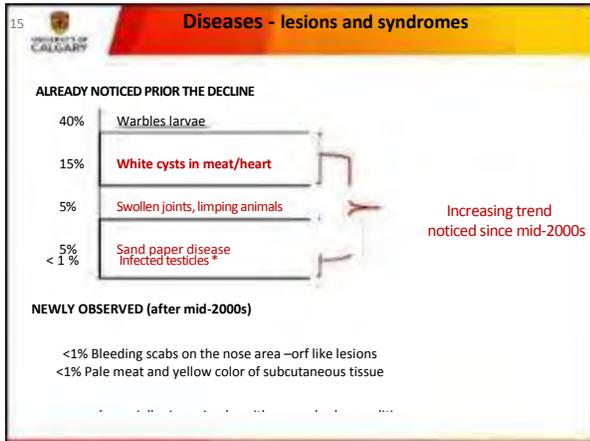
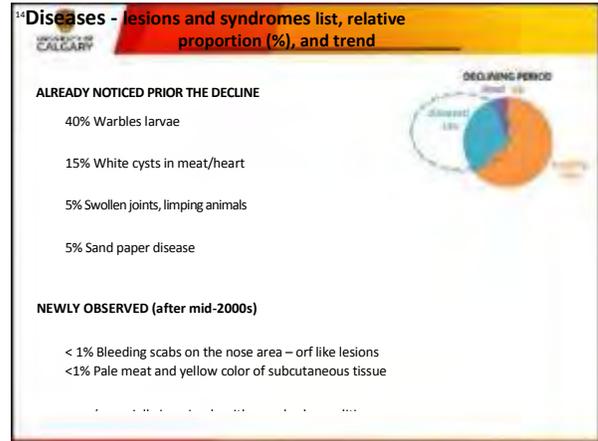
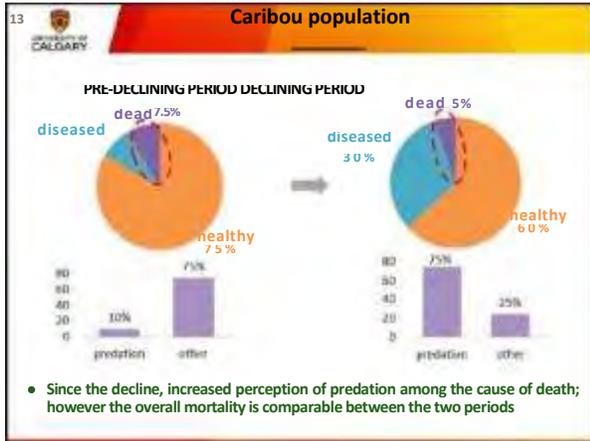
Presentation of results

Feedback from participants

n= 31/38







- 17
- Observation of poorer caribou body condition status since the decline
  - Increased observations of caribou with abnormalities since the decline
    - Increasing trend of some lesions/syndromes
    - Observation of diseases that might be new to the area (e.g. orf like lesions)
  - Unchanged perception of overall caribou mortality between the pre-declining and declining period
  - Participants' perceptions of factors that may have contributed to the decline of caribou in the area
    - Change in migratory routes (more to the east and west side)
    - Increase in predators
    - Deterioration of health status
    - Human disturbance
    - Change in climatic conditions that can have a direct or indirect effect on caribou populations

18 **Acknowledgements**

UNIVERSITY OF CALGARY

Community of Ikaluktutiak

Kitikmeot Inuit Association

Charlie Evalik, Stanley Anablak, Paul Emingak, Julia Ogina, Fred Pedersen, Joey Evalik, Sarah Jancke and Michelle Buchanan

Ekaluktutiak Hunters and Trappers Organization

CHARS Jimmy Haniliak, Alice Maghagak, Brenda Sitatak

January 10,



Summary report of the preliminary results of health analyses for caribou collared in the Kitikmeot, April 2015

Susan Kutz with [Dr. Tap Koffin](#), Angeline McIntyre and A.S. Carlsson

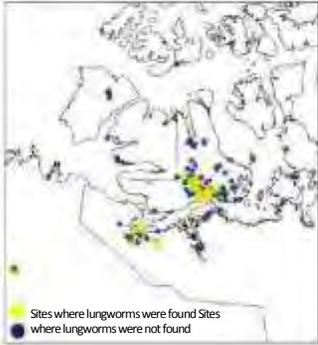
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**96NzgAYRic**

### Feces examined for Parasites



### Distribution of lungworm, *Varestrongylus eleguneniensis*, based on muskox fecal samples



● Sites where lungworms were found  
● Sites where lungworms were not found

### Blood samples: Tested for *Erysipelothrix rhusiopathiae*



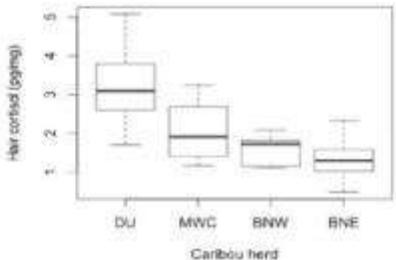


- Bacteria that is associated with muskox die-offs on Banks and Victoria Islands
- Can infect caribou and many other species, including people
- Only 'discovered' recently, but probably has been around for a longer time
- Very preliminary results: 5 of 22 (23%) of the tested positive

### Blood testing for *Brucella* and other diseases underway



### Preliminary results: Stress levels determined from hair



**Figure 1.** Dolphin Union caribou (DU, n=25) have significantly higher hair cortisol levels compared to Mountain Woodland caribou (MWC, n= 19), Bluenose West caribou (BNW, n=10) and Bluenose East caribou (BNE, 29).



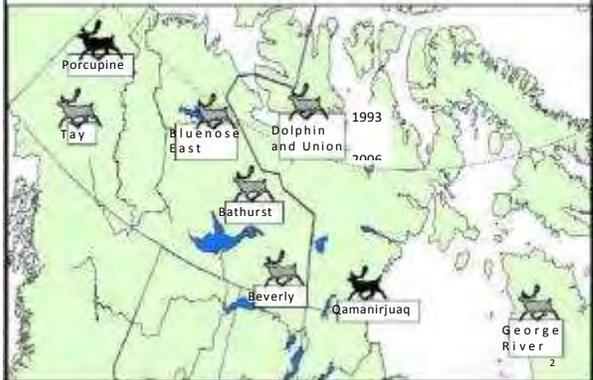
## Contaminants in Arctic Caribou



Mary Gamberg  
Whitehorse, Yukon

1

## NCP Arctic Caribou Sampling Program



2

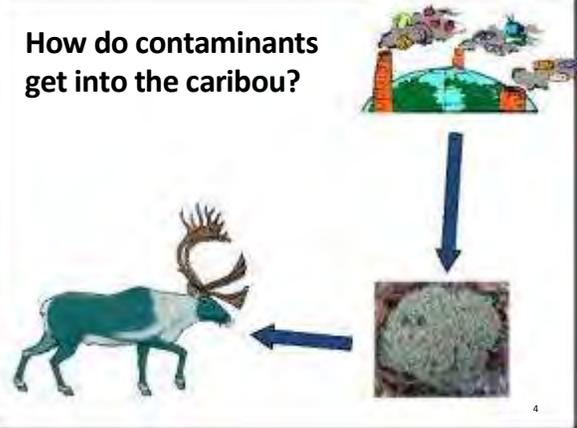
## Potential Contaminant Issues in Arctic Caribou

- Cadmium
- Mercury
- Fluorinated compounds
- Brominated compounds
- Radioactivity



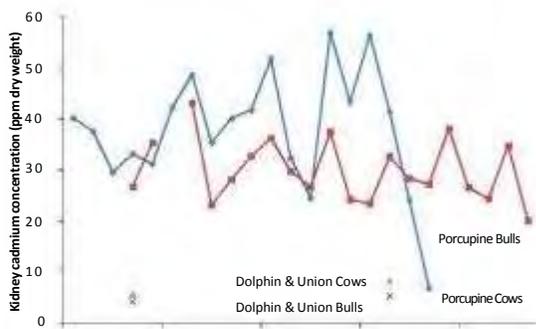
3

## How do contaminants get into the caribou?



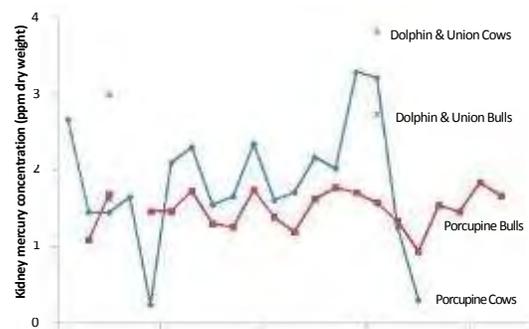
4

## Kidney Cadmium in Arctic Caribou



5

## Kidney Mercury in Arctic Caribou



6

## 'New' Contaminants

Brominated flame retardants (PBDEs)

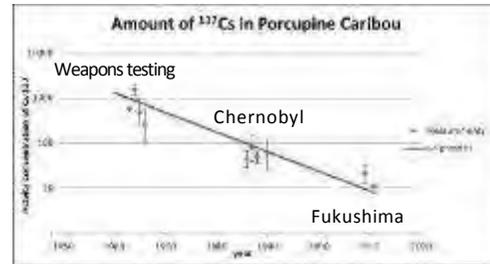


Fluorinated compounds (Teflon™)



7

## Effect of Fukushima Nuclear Accident



Geometric means (±SD) of the activity concentrations in the Porcupine caribou (MacDonald et al., 2007 except for

the last two data points which are from this study).

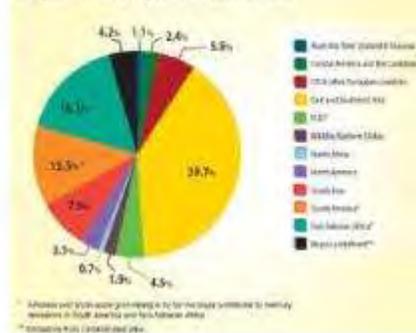
## Health Assessment

CARIBOU	Kidneys	Livers	Meat
Porcupine	24	12	All You Want

9

## Why do we continue to monitor caribou?

### Regional mercury emissions in 2010



10

## What do we know about mercury in caribou?

- In the fall, mercury is higher in cows than in bulls
- In the spring, mercury may be lower in cows than in bulls
- Mercury is generally higher in spring caribou than fall
- Mushrooms may provide a pulse of mercury in the fall

11

## Why do mercury levels fluctuate over years?

- Rain
- Snow
- Wind
- Temperature
- Migration patterns
- Time of green-up
- Industrial emissions
- Volcanoes
- Forest Fires

12

## What Can We Do?

### Monitoring Programs

Provide information on contaminants to individuals and communities

Provide evidence for Territorial, National and International legislation

13

### International Legislation

#### Stockholm Convention

- 2004
- Limits production of persistent organic pollutants (DDT, PCBs)
- 179 countries signed
- 152 countries ratified

#### Minimata Convention

- 2013
- Limits emissions of mercury
- 128 countries signed
- 20 countries ratified
- Not ratified by

14

# Thank You!

to  
All the Hunters who  
Contributed to this  
Program!

15

**Draft Table of Contents:**  
**Dolphin & Union Caribou Joint Management Plan**

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  - 6.6 Management Actions and Implementation Schedule (Table)
  - 6.7 Socioeconomic and Environmental Effects of Management
- 7. MEASURING PROGRESS
- 8. NEXT STEPS
- 9. REFERENCES



bDrLDJ „>“ APcbC c<ll'ac  
Building | *Nunavut* Together  
/Nunatiul iuqatigiingniq BAtir  
le *Nunattut* ensemble

# Nutigi

## Background & Species Information

**Lisa-Marie Lederc**



## Sections

- 3. Background
  - 3.1 Historical perspective
  - 3.2 Social perspective
    - History of subsistence and commercial harvesting
    - History of harvest management
- 4. Species information
  - 4.1 Species status
  - 4.2 Species description and biology
    - Life cycle and reproduction
    - Natural mortality and survival
    - Diet

### 3.1-2 Historical and social perspectives



- Since mankind has colonised the barren-land, his subsistence was based on caribou availability.
- Caribou:
  - At the based of the Northern Aboriginal Cultures
  - Has social and economical impacts.



### 3.3 Use of the herd



- 3.3.1 Communities that harvest the species
  - Dolphin and Union cross two jurisdictions
  - Winter: Paulatuk, Kugluktuk, Bay Chimo, Bathurst Inlet

### 3.3 Use of the herd



#### 3.3.2 History of subsistence and commercial harvesting

- Availability in function of the herd distribution and movement.
- Up to 1994 , 289 tags was allocated for caribou commercial harvest in
- Inuvialuit Harvest study (88-97): 681 to 441
- Nunavut Harvest study: Kuelukuk 1..575 Cambridge Bay. R11. Bathurst
- Small Harvest Study 1January 1994- May 1995 and October 1995- June 1996.
- Kugluktuk : 90% of barren-ground caribou and 10% DI

### 3.3 Use of the herd



#### 3.3.3 History of harvest management

- No TAH set on the Dolphin an Union Caribou : harvest caribou to the full level of his or her economic, social, and cultural needs.



## 4. Species information

4.1 Species Status

NMFS Special Concern (2013, 2015)

4.2 Species description and biology

Dolphin and Union caribou are intermediate in size and color between Peary caribou and Barren-ground caribou.

Dolphin and Union caribou is the most genetically differentiated of the barren-ground caribou (Zittlau, 2004) possibly due to genetic bottleneck.

They do not form well define calving ground, as its calving strategy is mainly individualist (Nagy et al., 2011).



4.3 Habitat Needs

Mid-tall grasses and green willows

Victoria Island, Mainland, sea-ice

## 4. Species information

4.2.1 Life cycles and reproduction

- Calves at 3 years of age

4.2.2 Natural mortality and survival

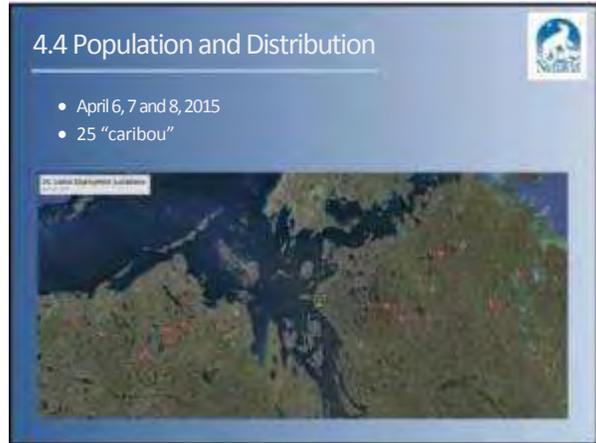
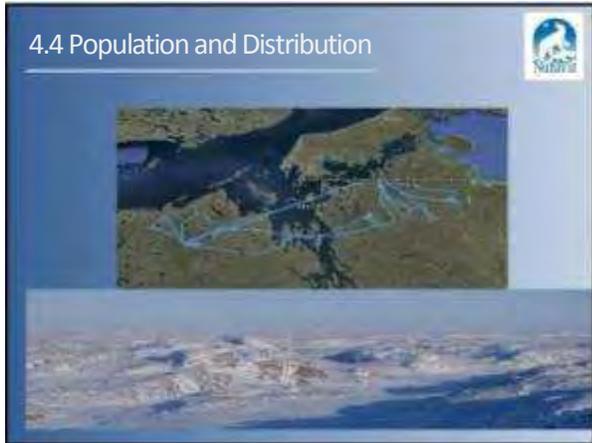
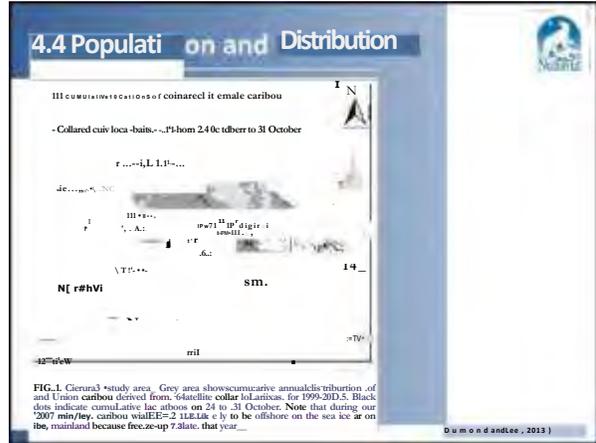
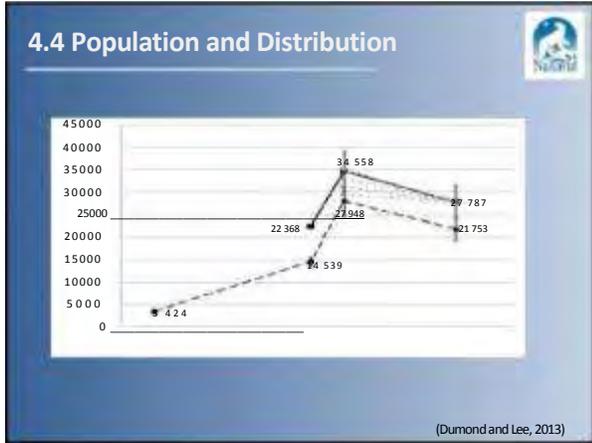
- Knowledge gaps

4.2.3 Diet

- Mid-tall grasses and green willows

4.3 Habitat Needs

- Victoria Island, Mainland, sea-ice



### 4.4 Population and Distribution

This slide features a satellite map of a coastal region with a river and surrounding land. Below the map are two side-by-side photographs of caribou in a snowy, mountainous landscape.

### 4.4 Population and Distribution

- Body condition was assessed according to CAR MA's Rangifer Health & Body Condition Monitoring Protocol Level II, section 3.
- The body index condition is scored to healthy caribou as health female caribou were targeted for this program. Healthy animal will have a better chance to resist disease, harsh winter conditions and predation and stay alive for the duration of the study.

The slide includes a bar chart with the y-axis labeled 'Frequency of Body Condition' and the x-axis labeled 'Body Condition Index'. There are three bars representing scores 1, 2, and 3. Bar 1 is the tallest, followed by bar 3, and bar 2 is the shortest. To the right is a photograph of a caribou standing in a snowy field.

### 2015 Survey

This slide shows an aerial photograph of a herd of caribou in a vast, snowy, open landscape.

### 2015 Survey

This slide displays a map titled 'Reconnaissance flights on October 27 (West of Cambridge Bay)'. The map shows the coastline of Cambridge Bay and surrounding islands. A legend in the bottom left corner lists 'Disturbance (km) (radius) (m)'. The map includes various data points and flight paths.

### 2015 Survey

This slide shows a map titled '2015 Survey' with a legend on the right side. The legend lists various parameters such as 'Disturbance (km) (radius) (m)', 'Altitude (m)', 'Speed (km/h)', 'Direction (deg)', 'Time (min)', 'Date', and 'Operator'. The map displays flight paths and data points across a coastal region.

### 2015 Survey

This slide features a map titled '2015 Survey' with a legend on the left side. The legend lists 'Color System', 'Disturbance (km) (radius) (m)', 'Altitude (m)', 'Speed (km/h)', 'Direction (deg)', 'Time (min)', 'Date', and 'Operator'. The map shows flight paths and data points across a coastal region.

Map of final systematic reconnaissance flights on October 29 (East of Cambridge Bay) and October 31 (West of Cambridge Bay) and second

## Dolphin and Union Caribou Management Plan Threats



Photo by Mathieu Dumond

Lisa Worthington

Environment & Natural Resources



## Dolphin and Union Caribou

- Killiniq, Island,
- Arctic-Island,
- Mainland caribou,
- Tuktu, tuktu, tuttu
- caribou du troupeau Dolphin-et-Union
- *Rangifer tarandus groenlandicus x pearyi*



Photo by Kim Poole



## Dolphin & Union Caribou Limiting Factors

### Limiting Factors

- \* Non-human factors that limit the abundance and
- \* Make a species more vulnerable
- \* E.g. age at first reproduction, prev. abundance

### Threats

- \* Caused by human beings
- \* Contribute to the population

## Dolphin & Union Caribou Limiting Factors

- \* Parasites and disease
- \* Predation
  - Wolves, grizzly bears



Photo by Kim Poole

## Dolphin & Union Caribou Threats

### Climate Change

Warmer temperatures cause:

- \* Later fall freeze-up and earlier spring thaw = longer staging time before migration.
- \* Insect harassment
- \* Warm weather = New parasites and diseases

\*\* Impact on vegetation = increase in high quality forage



Photo by Kim Poole

## Dolphin & Union Caribou Threats

### Industrial Activities and other Human Disturbance

- \* Tourism activities
- \* Aircraft
- \* Mining projects



Photo by Kim Poole

## Dolphin & Union Caribou Threats

### Presence of other species

- Muskox
- Geese
- Other herbivores (e.g. hare, lemmings)



## Dolphin & Union Caribou Threats

### Harvesting beyond a self-sustaining level

- NWT: there is no mechanism to collect harvest data.  
+
- Nunavut: harvest reporting is not mandatory.  
=
- When a population declines, a consistent rate of harvest could become a threat.



## Dolphin & Union Caribou Threats

### Other threats:

- Contaminants (includes impact of salt on habitat)









## **DOLPHIN AND UNION CARIBOU MANAGEMENT FRAMEWORK**

### **Outline of draft goal, objectives, approaches and actions Based on Group Discussion in Kugluktuk: March 25 – 27, 2015**

#### **MANAGEMENT GOAL/VISION:**

The long term persistence of healthy Dolphin and Union caribou recognizing their cultural importance.

To support a healthy and viable population of Dolphin and Union Caribou that moves freely between mainland and Victoria Island, and offers harvesting opportunities for present and future generations.

OR:

To support a healthy and viable population of Dolphin and Union Caribou that moves freely between mainland and Victoria Island, that allows for human use of caribou and their habitat while respecting conservation concerns..

To keep Dolphin and Union caribou from becoming threatened or endangered.

#### **OBJECTIVES:**

These are five objectives for the management of Dolphin and Union caribou. These objectives apply broadly across the herd's range in NWT and Nunavut.

1. Adaptively co-manage Dolphin and Union caribou by using a grassroots, community-based approach and the best traditional, community, scientific and technical information available.
2. Communicate and exchange information on an ongoing basis between co-management partners, communities, industry and the public with regard to monitoring and managing Dolphin and Union caribou.
3. Collect information on Dolphin and Union caribou using TK and IQ, community monitoring and scientific methods to inform sound management decisions.
4. Promote minimal human disturbance to habitat (particularly sea-ice crossings) to maintain a healthy, migratory population of Dolphin and Union caribou.
5. Ensure management actions including harvest are based on herd status.

## **APPROACHES TO ACHIEVE THESE OBJECTIVES:**

Recommended approaches (numbered as X.X.) are grouped on the following pages under each objective. More specific actions (numbered as X.X.X) are grouped below under each approach but will not be included in management plan (for implementation plan).

### **Objective #1:**

**Adaptively co-manage Dolphin and Union caribou by using a grassroots, community-based approach and the best traditional, community, scientific and technical information available.**

- 1.1 Work with co-management partners, Aboriginal governments and organizations, local harvesting committees, and industry to share information and collaborate on management actions.
- 1.2 Co-ordinate research among different co-management partners and research institutions.
- 1.3 Assess and manage cumulative impacts on Dolphin and Union caribou population and habitat.

### **Objective #2:**

**Communicate and exchange information on an ongoing basis between co-management partners, communities, industry and the public with regard to monitoring and managing Dolphin and Union Caribou.**

- 2.1 Encourage flow and exchange of information between parties, using various approaches, depending on group/demographic.

### **Objective #3:**

**Collect information on Dolphin and Union caribou using TK and IQ, community monitoring and scientific methods to inform sound management decisions.**

- 3.1 Improve our understanding of Dolphin and Union caribou health, distribution, key habitat and population indicators, impacts of human activities, cumulative effects and relationships.
- 3.2 Monitor Dolphin and Union caribou population.

### **Objective #4:**

**Promote minimal human disturbance to habitat (particularly sea-ice crossings) to maintain a healthy, migratory population of Dolphin and Union caribou.**

- 4.1 Monitor human and industrial disturbance.
- 4.2 Minimize human and industrial disturbance.
- 4.3 Monitor changes to habitat on an ongoing basis.
- 4.4 Work with all levels of governments to manage populations of other species that affect Dolphin and Union caribou habitat (e.g., overabundant geese).

### **Objective #5:**

**Ensure management actions including harvest are based on herd status.**

**Ensure long term harvest of Dolphin and Union caribou can be supported by the population.**

- 5.1 Obtain accurate harvest data.
- 5.2 Access herd status based on information collected.
- 5.3 If necessary, manage harvesting activities within acceptable limits to ensure that harvesting opportunities are available in the future by respectfully harvesting today.

**MORE DETAILS – List Actions**

**APPROACHES AND ACTIONS TO ACHIEVE THESE OBJECTIVES:**

**Objective #1:**

**Adaptively co-manage Dolphin and Union caribou by using a grassroots, community-based approach and the best traditional, community, scientific and technical information available.**

- 1.1 Work with co-management partners, Aboriginal governments and organizations, local harvesting committees, and industry to share information and collaborate on management actions.
  - 1.1.1 Incorporate community and traditional knowledge and ensure that plans and actions for Dolphin and Union caribou management are informed by this knowledge.
  - 1.1.2 Continue to work with wildlife management advisory boards, game councils and local HTO/HTAs on Dolphin and Union caribou monitoring, stewardship and management.
  - 1.1.3 Work with industry on best practices and mitigation, monitoring and research.
  - 1.1.4 Continue engaging hunters, industry and public about Dolphin and Union caribou management.
  - 1.1.5 Annually review new information on demographics and habitat, and adapt management practices accordingly.
  - 1.1.6 If necessary, recommend alternative management actions (e.g., stricter habitat and/or harvest management) allowing for natural variation in numbers.
  - 1.1.7 Annually report on management actions and progress made toward meeting objectives in management plan.
- 1.2 Co-ordinate research among different co-management partners and research institutions.
  - 1.2.1 Identify knowledge gaps and establish high priority research questions.
  - 1.2.2 Co-ordinate research activities with different research institutions and promote high priority research.
  - 1.2.3 Ensure local involvement in research activities (planning, field research).

**Objective #2:**

**Communicate and exchange information on an ongoing basis between co-management partners, communities, industry and the public with regard to monitoring and managing Dolphin and Union Caribou.**

- 2.1 Encourage flow and exchange of information between parties, using various approaches, depending on group/demographic.
  - 2.1.1 Conduct “out on the land” trips, where experienced hunters (elders if they’re able) take youth out on the land.
  - 2.1.2 Use social media and the internet to reach out to youth.
  - 2.1.3 Conduct school visits to educate youth about managing Dolphin and Union caribou.
  - 2.1.4 Conduct community meetings to exchange information with communities about management of Dolphin and Union caribou.
  - 2.1.5 Investigate the potential of having industry contribute information to research and monitoring.
  - 2.1.6 Ensure ongoing communication between co-management partners and through supporting community monitoring programs.

**Objective #3:**

**Collect information on Dolphin and Union caribou using TK and IQ, community monitoring and scientific methods to inform sound management decisions.**

- 3.1 Improve our understanding of Dolphin and Union caribou health, distribution, key habitat, relationships and cumulative effects.
  - 3.1.1 Identify geographic areas of importance to Dolphin and Union Caribou through research and community/traditional knowledge.
  - 3.1.2 Monitor changes in predator abundance through community-based monitoring.
  - 3.1.3 Promote research on relationships between Dolphin and Union caribou and predators (including relatively new predators such as the grizzly bear on Victoria Island).
  - 3.1.4 Promote research on relationships between Dolphin and Union caribou and other species (e.g. other ungulates, geese).
  - 3.1.5 Promote research on Dolphin and Union caribou population, habitat, vital rates, and health and condition, including possible contaminants.
- 3.2 Monitor Dolphin and Union caribou population and periodically assess herd status.
  - 3.2.1 Expand community monitoring programs that provide information on Dolphin and Union caribou condition, population trends, and predators.
  - 3.2.2 Periodically estimate population size and trend.
  - 3.2.3 Assess herd status annually, based on framework.
- 3.3 Assess cumulative impacts on Dolphin and Union caribou population and habitat.
  - 1.3.1 Develop an approach to modelling cumulative effects.

**Objective #4:****Promote minimal disturbance to habitat (particularly sea-ice crossings) to maintain a healthy, migratory population of Dolphin and Union caribou.**

- 4.1 Monitor and minimize human and industrial disturbance.
  - 4.1.2 Develop guidelines, standard advice, and best practices for shipping, tourism and industry that can be regulated and evaluated;
  - 4.1.3 Identify organizations (e.g., HTOs and communities) who could/would play a lead role in promoting standard advice and guidelines for shipping, tourism and industry.
  - 4.1.4 Work with Transport Canada, tourism operators and other industry to regulate shipping and industry activities (e.g., establishing seasonal limitations for industry shipping and cruise ships during migration season and adjusting these in response to caribou status, if necessary).
  - 4.1.5 Develop guidelines for oil spill response related to caribou.
  
- 4.2 Monitor changes to habitat on an ongoing basis.
  - 4.2.1 Track human-caused landscape changes.
  - 4.2.2 Monitor industrial activity including shipping traffic.
  - 4.2.3 Track changes to sea ice and potential impacts to Dolphin and Union caribou.
  - 4.2.4 Monitor and evaluate compliance with (or implementation of) guidelines, standard advice, and best practices mentioned in 4.1.2.
  - 4.2.5 Work with communities to reduce release of contaminants through various venues (see 2.1.4).
  
- 4.3 Work with all levels of governments to manage populations of other species that affect Dolphin and Union caribou habitat (e.g., overabundant geese).
  - 4.3.1 Promote traditional harvesting of overabundant species through subsistence and sport hunts.
  - 4.3.2 Approach other governments to open hunting season earlier for geese.
  - 4.3.3 Promote collection of eggs within communities.

**Objective #5:****Ensure management actions including harvest are based on herd status.**

- 5.1 Obtain accurate harvest data.
  - 5.1.1. Educate people on the importance of reporting harvest.
  - 5.1.2. Work with local Hunters & Trappers Committees/Organizations and regional Wildlife Advisory Boards to collect accurate information on harvest levels.
  - 5.1.3. Report estimated total harvest levels, including the number harvested and the sex ratio, to caribou management authorities and co-management partners.
  
- 5.2 Assess herd status based on information collected.
  
- 5.3 If necessary, manage harvesting activities within acceptable limits to ensure that harvesting opportunities are available in the future by respectfully

harvesting today.

- 5.2.1. Investigate and consider defining *acceptable harvest* levels appropriate for different population size and trend in the herd.
- 5.2.2. Elders teach youth about wise harvesting practices that minimize negative impacts on caribou; includes no wasting of meat, harvesting only what is needed, proper marksmanship, ability to distinguish types of caribou; avoiding harvest of cows with calves.
- 5.2.3. Investigate the possibility of promoting alternative food sources through harvest of other species.
- 5.2.4. Annually review harvest levels and make management recommendations if necessary (e.g. temporary harvest limitations).

## FOUR OPTIONS FOR DOLPHIN & UNION CARIBOU MANAGEMENT GOAL

1. The long term persistence of healthy Dolphin and Union caribou recognizing their cultural importance.
2. To support a healthy and viable population of Dolphin and Union Caribou that moves freely between mainland and Victoria Island, and offers harvesting opportunities for present and future generations.
3. To support a healthy and viable population of Dolphin and Union Caribou that moves freely between the mainland and Victoria Island, and allows for human use of caribou and their habitat while respecting conservation concerns.
4. To keep Dolphin and Union caribou from becoming threatened or endangered.

From the Bluenose Management Plan

### 9.2 When Do We Take Action

Our actions to help the caribou herds will be determined in part by the herd size, and whether it is increasing or decreasing. Management decisions will also be influenced by other information from harvesters and scientists such as recruitment, bull-to-cow ratio, body condition and health.

In this Management Plan there are four levels of herd status and management actions. These are colour-coded yellow, green, orange, and red.<sup>14</sup> Management actions are based on defined phases of the population cycle. The herd status provides a trigger for specific management actions.

-  **Yellow:** The population level is intermediate and increasing
-  **Green:** The population level is high

- Orange:** The population level is intermediate and decreasing
- Red:** The population level is low

A representation of these thresholds is provided with corresponding colours in **Figure 8**.

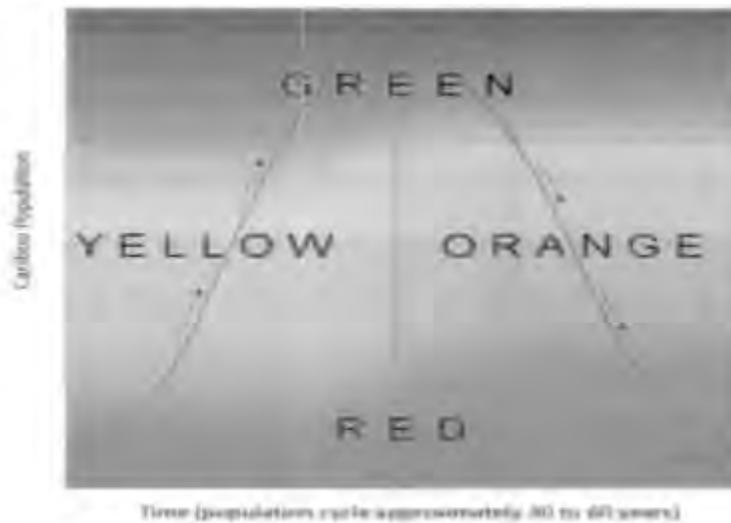


Figure 8 | Caribou population status as colour zones.

Thresholds to help guide management actions were determined with input received from community and technical experts in a consensus-based process (**Table 2**). ACCWM members combined available science (historical high and low populations) with traditional knowledge and experience. Slight differences in thresholds between herds reflect the results from community engagements. The historic high, as measured by surveys, for each of the three herds, and the change over time, are shown in **Figures 4-6** of this report and described in more detail in the **Scientific Report**. Sufficient information was not available from results of modelling simulations to help set thresholds. However, this could be a helpful tool to provide further evaluation or adjustments in future planning. In addition, ENR has recently developed a “Rule of Thumb Approach” that describes a framework for barren-ground caribou harvest recommendations based on herd risk status. This approach relies on indicators – such as population size and trend – to help estimate the potential risk to a herd under different management scenarios; it is included with the **Scientific Report**.

The thresholds in **Table 2** are approximate and will be used to help guide management decisions and actions based on herd status. As explained earlier, estimated herd size is not the only indicator used to set a herd status into one of the four colour zones. Herd status decisions will use estimates of the overall number of caribou, whether a herd is growing in size or is declining (trend), and other monitoring indicators to assist in interpretation. In practise this means that although an estimate for a herd may cross or be very near a threshold, the determination of herd status will take into account all available information – it is not only the threshold value that is used to determine the colour zone. For example, a recommendation could be made to set a herd in a colour zone before a population estimate reaches a threshold value, or a decision could be made to keep a herd in a colour zone despite an estimate placing it just outside the threshold, if this is the best action based on all indicators considered together and according to the principles stated in this Management Plan.

Table 2: Thresholds for the status of the Cape Bathurst, Bluenose-West, and Bluenose-East Caribou Herds.

HERD	Historic High As measured by surveys	Threshold Between green & yellow/orange	Threshold Between red & yellow/orange
Cape Bathurst Herd	12,000	12,000	4,000
Bluenose West Herd	56,000	56,000	15,000
Bluenose East Herd	60,000	60,000	20,000

Table 3: Summary of management actions.<sup>16</sup>

Management Actions Based on Herd Status/Colour Zone				
Management Action	The population level is intermediate and increasing	The population level is high	The population level is intermediate and decreasing	The population level is low
Education	<p>Recommend education programs for all status levels. Ideas for educational themes include:</p> <ul style="list-style-type: none"> <li>• Promoting total use of harvested caribou, and proper butchering and storage methods;</li> <li>• Limiting wounding loss;</li> <li>• Letting the leaders pass;</li> <li>• Promoting community hunts with experienced hunters;</li> <li>• Use of alternate species; and</li> <li>• Increased sharing of traditional foods.</li> </ul>			
Habitat	<ul style="list-style-type: none"> <li>• Identify and recommend protection for key habitat areas;</li> <li>• Review results of monitoring, including cumulative effects, to ensure enough habitat is available and caribou are able to move between areas of good habitat;</li> <li>• Recommend important habitat as a 'value at risk' for forest fire management.</li> </ul>			
Land use activities	<ul style="list-style-type: none"> <li>• Review results of cumulative effects monitoring programs;</li> <li>• Provide advice on mitigation of industrial impacts to proponents and regulators.</li> </ul>	<ul style="list-style-type: none"> <li>• Review results of cumulative effects monitoring programs;</li> <li>• Provide advice on mitigation of the impacts of exploration and development activities to proponents and regulators.</li> </ul>	<ul style="list-style-type: none"> <li>• Review results of cumulative effects monitoring programs;</li> <li>• Provide advice on mitigation of industrial impacts to proponents and regulators;</li> <li>• Provide active and accessible communication and recommend education programs for all including proponents and airlines;</li> <li>• Recommend increased enforcement of land use regulations, including community monitors.</li> </ul>	<ul style="list-style-type: none"> <li>• Work directly with proponents and regulators of exploration and development activities to advise on mitigation measures;</li> <li>• Review results of cumulative effects monitoring programs;</li> <li>• Provide active and accessible communication and recommend education programs for all including proponents and airlines;</li> <li>• Recommend increased enforcement of land use regulations, including community monitors.</li> </ul>

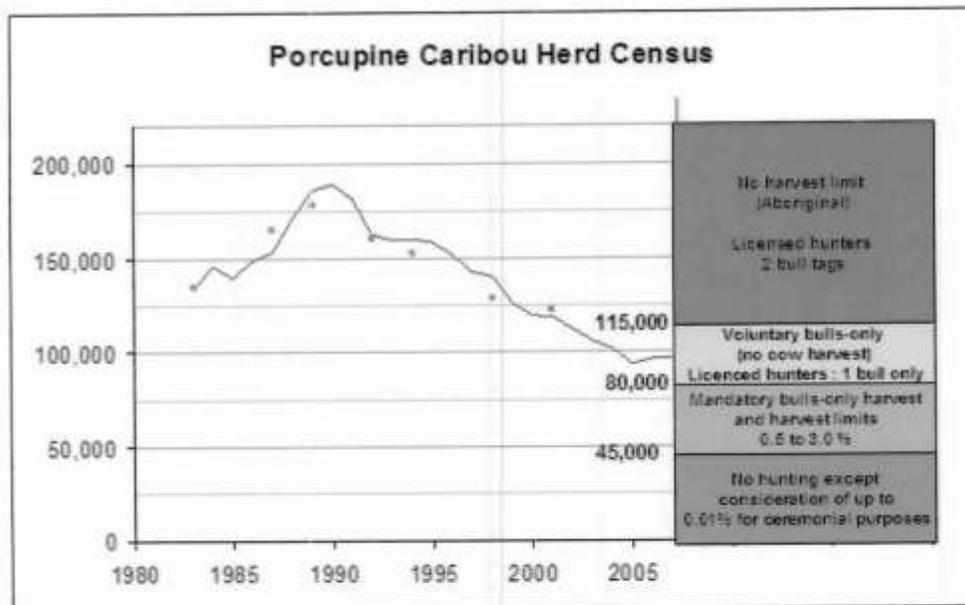
<sup>16</sup> These management actions are in addition to the research and monitoring actions described in section 8.0 and summarized in Table 1.

Management Actions Based on Herd Status/Colour Zone				
Management Action	The population level is intermediate and increasing	The population level is high	The population level is intermediate and decreasing	The population level is low
Predators	<ul style="list-style-type: none"> <li>Continue research programs to monitor predator condition (e.g., carcass collection and community monitoring programs).</li> </ul>	<ul style="list-style-type: none"> <li>Continue research programs to monitor predator condition (e.g., carcass collection and community monitoring programs).</li> </ul>	<ul style="list-style-type: none"> <li>Review results of research programs that monitor predator abundance and predation rates;</li> <li>Consider recommending options for predator management.</li> </ul>	<ul style="list-style-type: none"> <li>Review results of research programs that monitor predator abundance and predation rates;</li> <li>Consider recommending options for predator management.</li> </ul>
Harvest	<ul style="list-style-type: none"> <li>Recommend easing limits on subsistence and then resident harvests ;</li> <li>Consider recommending outfitter and commercial harvests at discretion of the ACCWM.</li> </ul>	<ul style="list-style-type: none"> <li>Support harvest by beneficiaries of a Land Claim and members of an Aboriginal people, with rights to harvest wildlife in the Region;</li> <li>Recommend that if subsistence needs are met resident harvest should be permitted (with limits);</li> <li>Potentially recommend resident (non-beneficiary), non-resident, sport hunts, and/or commercial harvests.</li> </ul>	<ul style="list-style-type: none"> <li>Recommend a mandatory limit on subsistence harvest based on a TAH accepted by the ACCWM;</li> <li>Prioritize the collection of harvest information;</li> <li>Recommend no resident, outfitter or commercial harvest;</li> <li>Recommend a majority-bulls harvest, emphasizing younger and smaller bulls and not the large breeders and leaders;</li> <li>Recommend harvest of alternate species and encourage increased sharing, trade and barter of traditional foods, such as the use of community freezers;</li> <li>Recommend increased enforcement including community monitors.</li> </ul>	<ul style="list-style-type: none"> <li>Recommend harvest of alternate species and meat replacement programs, and encourage increased sharing, trade and barter of traditional foods;</li> <li>Prioritize the collection of harvest information;</li> <li>Review of mandatory limit for subsistence harvest for further reduction;</li> <li>Recommend increased enforcement including community monitors;</li> <li>Resident, commercial, or outfitter harvest remain closed.</li> </ul>

## B. Colour Chart

At the Inuvik workshop it was agreed to use a colour chart for showing what the harvest should be in relation to how big the herd is. Such colour charts are already used for fire management and salmon management, and so many people understand what they mean and how to use them.

### Harvest Management Colour Chart



Red dots are estimates of the number of caribou from counts during the photocensus.

Blue line is the trend in population size predicted by the Caribou Calculator using available data each year.

**All hunters in all colour zones must report their harvest at all times. Rigorous and verifiable harvest monitoring will be an important information source for ongoing herd management.**

**Green** 'Take what you need' — This means no aboriginal harvest restrictions; in other words, nothing special would be done, and people could hunt for what they need. Of course, respect for the caribou would always be emphasized. Licensed hunters would receive a maximum of two bull tags.

**Yellow** 'Voluntary Bulls only' — Bulls-only harvest, with the understanding that the goal is to have no cows harvested — governments will use tools like education initiatives, legislation, regulations, and/or bylaws to work cooperatively to achieve this 100% bulls-only target. Licensed hunter harvest would be reduced to one bull tag. The Parties are committed to achieving 100% bulls-only harvest. If this target is not effectively met, the Parties will commit to review the measures, including the potential application of a mandatory bulls-only harvest.

**Orange** 'Mandatory bulls only and harvest limits' — This means that the Parties would take steps to ensure hunters took only bulls and the total harvest and the related sub-allocations are collectively within the annual allowable harvest.

**Red** 'No hunting' — This means all hunting would cease except for the opportunity of a very small (0.0%-0.1%) bull-only subsistence-ceremonial aboriginal harvest.

## **Herd Management**

The Management Plan recommends three approaches to overall monitoring and management of the population that accounts for natural long term population fluctuations (Table 3).

### *Level – 1: Core Management (Stable or increasing trend/high population)*

Level 1 core management actions apply at all times during the population cycle and represents the minimum level of population management activities that need to be conducted. Core management actions are used to detect a decline in productivity and abundance.

### *Level – 2: Enhanced Management (Declining trend)*

Level 2 is implemented when there is an indication that the population is declining. The management actions are designed to detect changes at a finer scale. At this level a total allowable harvest may have to be applied and/or modified.

### *Level – 3: Critical Threshold Management (Population level below Basic Needs Level)*

Level 3 is implemented when there are not enough caribou to meet the basic needs level. Management actions for level 3 will remain the same for those at level 2, but would involve more intensive harvest management. At this level it is expected that non-quota limitations will be introduced and a Total Allowable Harvest will have to be set below the Basic Needs Level.

A → High/Stable

- > <sup>\*\*1</sup> Education - youth  
(including other wildlife)
- > Encourage harvest of Predators  
(\$\$ + Education)
- > No Harvest Restrictions  
on Beneficiaries

- > Harvest Monitoring  
(Community Based monitoring)
  - > Community Based  
Mgm
  - > Consider other  
harvest  
based on community  
land claim
- Commercial - Meat Plant  
Sport hunting  
Resident hunting  
Community (commercial) harvest

# Declining

- > increase <sup>Prioritize</sup> monitoring  
(+ sharing of information)  
↳ ex: Sample Kits
- Positive > Harvest Management  
↳ limiting / <sup>None-quota limitations</sup> Male only +
- > Consider ending "other" harvest  
(commercial)
- > Restricting Industry  
(activities)
- ↑ > Education - elders → youth  
(\*include high education)  
> alternative wildlife <sup>(access youth)</sup>  
> Trapper training to encourage <sup>handling</sup> harvest  
predators.
- > Bring Communities / Agencies together  
(collaboration)

Low  
(even begining of increase)

> monitoring → Prioritize

> surveys

> harvest?

> TAH (season?)

> harvest of alternative herds/  
wildlife

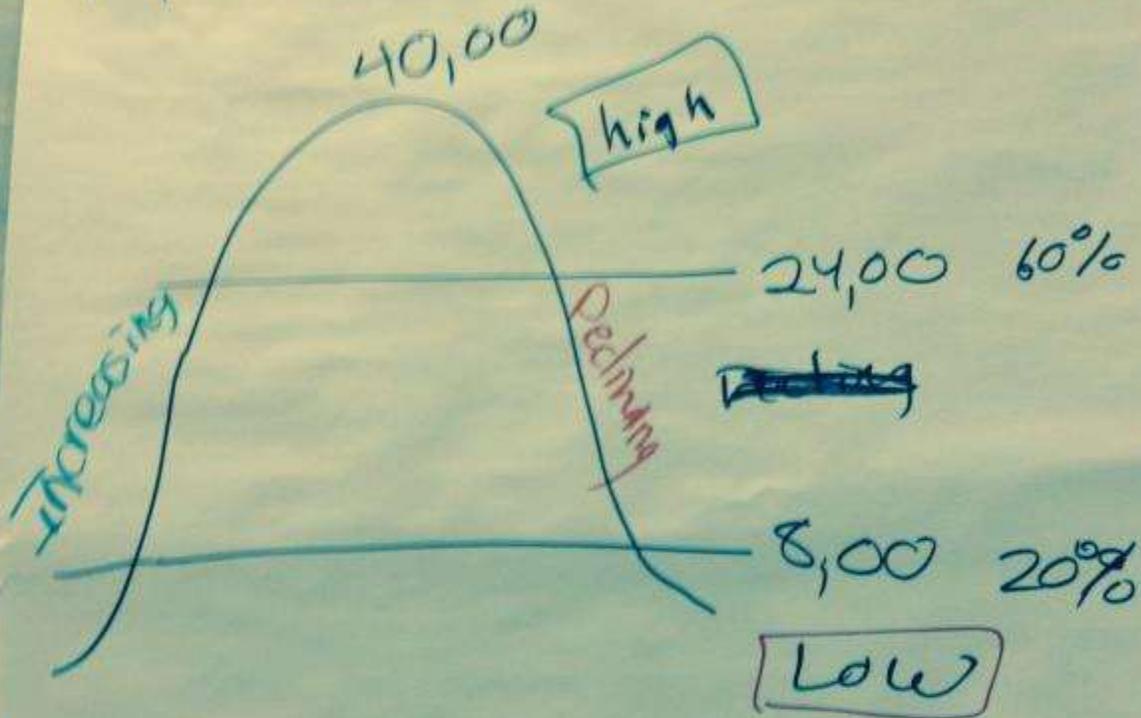
> Education

> why ~~TAH~~ TAH

# Increasing

- > Consider lifting restrictions off Industry
- > Consider lifting Restrictions on Harvest
- > Education
- > "Baseline" monitoring (lower priority but some needed)

# Population



## Other indicators:

- > climate change - insects - ~~age~~
- > health/disease carrier

> recruitment

- > Distribution/migration  $\Delta$ s
- > other species?



## **Barren-ground Caribou (Dolphin and Union population)** **POSITION on the Proposed Management Plan**

The following questions are intended to assist you in providing comments. They are not limiting and any other comments you may have are welcome.

**Questionnaire filled out by:**  
**Amanda Dumond**

(Print name / title)

**Organization:**  
**Kugluktuk Angoniatit Association**

**Date questionnaire completed**  
\_\_\_ May 29<sup>th</sup>, 2017 \_\_\_\_\_

**Do you have enough information to make a decision on your position/opinion on the support of the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan?**

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 on the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan?**

- Support the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan
- Do not support the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan
- Indifferent to the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan

**What are your reasons for this position?**



### Do you have any additional comments?

Just to let you know, this document was given to the board members weeks ago, but we haven't had a meeting quorum to discuss this. To date, I have not had any comments regarding this document.

I am not at liberty to answer for the board, so I leave the sections above blank.

Larry and I were talking about this earlier and we would like it mentioned somewhere around page 67, that the Kugluktuk HTO had made a motion to suspend all caribou commercial and sports hunts (for all herds). Also, the local outfitter had voluntarily quit all sports hunts around Contwayto Lake. These actions show how proactive this board is, and how important it is for us to manage our wildlife.

Amanda



## Barren-ground Caribou (Dolphin and Union population) POSITION on the Proposed Management Plan

The following questions are intended to assist you in providing comments. They are not limiting and any other comments you may have are welcome.

Questionnaire filled out by:  
Bobby Greenley, Chairman

(Print name / title)

Organization:

Ekaluktutiak Hunter's and Trapper's Organization (EHTO)

Date questionnaire completed

23-MAY-2017

Do you have enough information to make a decision on your position/opinion on the support of the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan?

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 on the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan?

- Support the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan
- Do not support the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan
- Indifferent to the proposed Barren-ground Caribou (Dolphin and Union population) Management Plan

What are your reasons for this position?

- The EHTO feel there was not enough follow-up/feedback to base a decision of support/non-support to the Management Plan for D/U caribou herd.
- The EHTO feel that a member of the co-management group (GN-DOE or others) should have presented this document to the Board and community to explain the conditions and outcomes of support/non-support.
- The EHTO Board and its members must emphasize clearly that they do not in any way support any discussion of applying a TAH or Zones to the D/U caribou herd.



### Do you have any additional comments?

- As indicated in the Draft document, the most recent population size and survey cannot be accepted by the EHTO. During a survey in 2016, a member of the EHTO who was helping to conduct the survey was told not to include numbers of caribou that were not within the transect lines of the survey, yet they were within the D/U range and most likely a part of the population.
- The EHTO has approved its own management initiatives by lowering the number of commercial/sports hunts allowed for this herd and presented this to the NWMB.
- The EHTO Board and its members will continually voice the concern of increased predators which have become more commonly sighted which were uncommon to the area on Victoria Island.
- Recent surveys conducted by the GN-DOE have not been presented effectively in a timely fashion to the EHTO and the community members, to base a decision of support/no-support to the Management plan.
- Objective #2 of the Management Plan must be better implemented for co-management partners (EHTO) and especially for the harvesters of the D/U herd, to accept recommendations or decisions to the Management plan.

## **Major modifications following the various reviews**

Minor editorial changes were made throughout the document, and only larger changes are discussed below.

### **Management Plan for the Dolphin and Union Caribou (*Rangifer tarandus groenlandicus x pearyi*) in the Northwest Territories and Nunavut**

#### Preface

- No large changes.

#### Acceptance Statement

- No changes, as the statements will be made at a later date.

#### Acknowledgements

- Names of individuals that provided comments during the First Jurisdictional Technical Review were added.

#### Executive Summary

- Clarification was added to the comparison of Dolphin and Union Caribou to other sub-species and populations.
- Information about the 2015 population estimate was added.
- Information about adaptive management added.

#### Acronyms

- Acronym table was added for reference.

#### Table of Contents

- Added a List of Figures, and a List of Tables.

#### 1. Introduction

- Section was shortened to avoid repetition in other areas and to make the text more succinct.

#### 2. Plan Development

##### 2.1 Purpose and Principles

- Section was shortened to avoid repetition and to make the text more succinct.

##### 2.2 Planning Partners

- Suggestions added to clarify the roles of planning partners / legislation added.

##### 2.3 Management Planning Process

- Section was shortened slightly to avoid repetition and to make the text more succinct.

## 2.4 Inuit Qaujimatugangit and Traditional Knowledge

- No large changes.

## 3. Historical and Social Perspective

- Section was shortened slightly to avoid repetition and to make the text more succinct.

### 3.1 Communities that Harvest Dolphin and Union Caribou

- Section was shortened slightly to avoid repetition and to make the text more succinct.

### 3.2 Use of the Herd and History of Harvest Management

- Additional information about past harvest reporting was included.

## 4. Species Information

### 4.1 Species Status Assessment

- The COSEWIC and SARC status assessments were moved from Appendix B to this section.
- Text was added to clarify the difference between how COSEWIC/SARA classify Dolphin and Union Caribou (*Rangifer tarandus groenlandicus*) compared to how the GNWT/GN classify the population (*Rangifer tarandus groenlandicus x pearyi*).

### 4.2 Species Description and Biology

- Clarifying information about how to distinguish Dolphin and Union Caribou from other sub-species and populations was added.
- Section was shortened slightly to avoid repetition and to make the text more succinct.

#### 4.2.1 Life Cycle and Reproduction

- Information about the timing of life cycle events was added.

#### 4.2.2 Natural Mortality and Survival

- No large changes.

#### 4.2.3 Diet

- No large changes.

#### 4.2.4 Habitat Needs

- Section was shortened slightly to avoid repetition and to make the text more succinct.
- Figures were modified to include place-names mentioned in the section and document overall. The placement of figures within the text was also changed for better flow of the document, and one figure was added to show fall migrations.
- Information about the timing of crossings

#### 4.3 Population and Distribution

- Restructured this section by creating Table 2 to make the text more succinct regarding population and distribution information.
- Information about the 2015 population estimate was added.

### 5. Threats and Limiting Factors

#### 5.1 Threat Assessment

- The threats table provided in Appendix D was moved to this section so major threats to the species can be quickly assessed.

#### 5.2 Description of Threats

##### Changes to Sea Ice Affecting Migration

- Moved the discussion of cumulative impacts of climate change (sea-ice related issues) and shipping traffic after reviewing each of these threats separately. It is now more clear to the reader what each of the threats is before reviewing their cumulative impact.

##### Predation and Competition

- No large changes.

##### Harvest

- Added text explaining the change of rank between 2014 and 2016 threat assessment.

##### Parasites, Diseases and Insect Harassment

- No large changes.

##### Other Habitat Changes due to Climate Change

- This section was moved below to avoid confusion with the first section of the Threats addressing changes to sea ice.

##### Icing Events

- No large changes.

##### Mining

- No large changes.

##### Roads

- No large changes.

##### Flights

- No large changes.

## Other Threats

- Summarized the threats of this category in a paragraph and moved detailed information to the Appendix C.

## 5.3 Knowledge Gaps

- An additional knowledge gap was added: Potential impact of future development on Dolphin and Union caribou.
- Prioritized Knowledge gaps.

## 6. Management

### 6.1 Management Goal

- Rewording of the goal to make it clearer.

### 6.2 Management Objectives

- No large changes.

### 6.3 Approaches to Management of the Dolphin and Union Caribou

- This section was moved before the Approaches to Achieve Objectives to facilitate reading.
- Added a 'Threats and/or knowledge gaps addressed' column to link back to the initial reason for concern and how we are addressing that concern.
- Management Plan Goal row: moved this information in its own section at the end of the document called "7. Measuring Progress".

### 6.4 Approaches to Achieve Objectives

- Updated Objective 1, Objective 2 and Objective 3 to reduce redundancy and make it more clear how these 3 objectives are distinct from one another.

### 6.5 Current Management and Other Positive Influences

- This section was moved to the Management section to facilitate reading.

### 6.6 Managing Based on Population Status (Level)

- Replaced term 'herd' with 'population'.

### Determining Population Status

- No large changes.

### Management Actions Recommended

- No large changes.

## 7. Measuring Progress

- New section added: to define and measure progress toward achieving the management goal.

## 8. Next Steps

- No large changes.

## 9. References

- No large changes.

### Appendix A: Dolphin and Union Caribou Management Framework

- No large changes.

### Appendix B: Assessments of Dolphin and Union Caribou

- Appendix B was removed as the status assessments were placed in the body of the document.

### Appendix C: Effects on the Environment and Other Species

- No large changes.

### Appendix D: IUCN Threat Classification Table and Threat Calculator Results for Dolphin and Union Caribou

- No large changes.