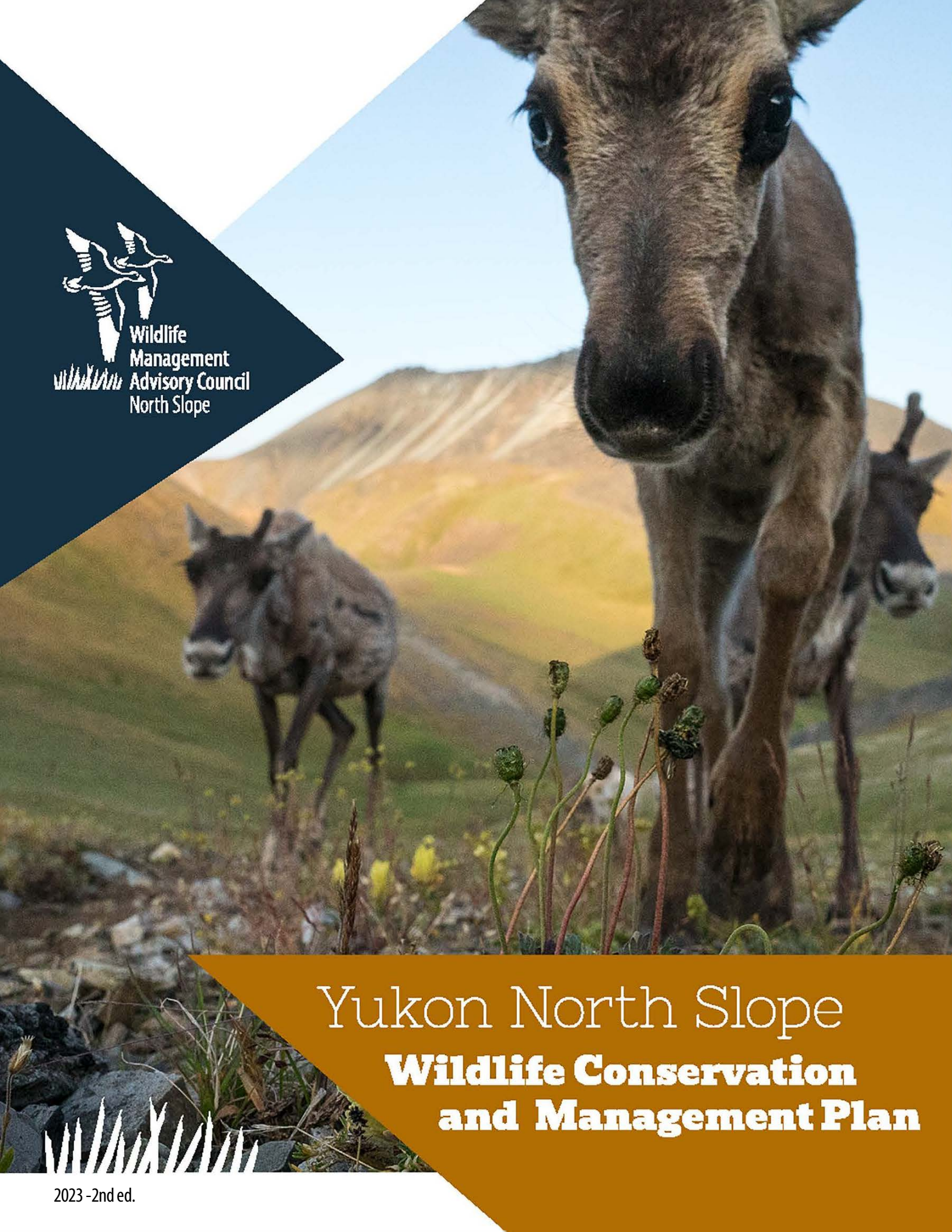


Wildlife Management Advisory Council North Slope

Yukon North Slope

Wildlife Conservation and Management Plan

2023 - 2nd ed.

Disclaimer: This plan was prepared in accordance with the requirements of the Inuvialuit Final Agreement (IFA) to assist government authorities and Inuvialuit to achieve and maintain the principles of conservation set out for the Yukon North Slope by subsections 12(2) and (3) of the IFA. The Plan is not a legally binding document. It does not affect the rights, roles or responsibilities set out in the IFA or otherwise by law. The Plan is intended to advise and assist governments and Inuvialuit to protect wildlife and habitat and ensure the continuation of Inuvialuit harvesting on the Yukon North Slope.

In the 2nd ed. (2025), corrections were made to the spelling of certain Uummarmiutun wildlife terms and place names. Thank you to Renie, Nellie and Carol Arey for providing the correct spelling.

Cover photo by Peter Mather

Yukon North Slope Wildlife Conservation Management Plan Signatories

We the undersigned on behalf of our respective governments and organizations approve the Yukon North Slope Wildlife Conservation and Management Plan.



Honourable Steven Guilbeault

Minister of Environment and Climate Change
Government of Canada
Ottawa, Ontario



Honourable Nils Clarke

Minister of Environment
Government of Yukon
Whitehorse, Yukon



Duane Smith

Chair and Chief Executive Officer
Inuvialuit Regional Corporation
Inuvik, Northwest Territories



Dennis Arey

Chairperson
Inuvialuit Game Council
Inuvik, Northwest Territories

RECOMMENDATION FROM THE WILDLIFE MANAGEMENT ADVISORY COUNCIL (NORTH SLOPE)

Wildlife Management Advisory Council North Slope

Honourable Steven Guilbeault

Minister of Environment and Climate Change
Government of Canada
Ottawa, Ontario

Duane Smith

Chair and Chief Executive Officer
Inuvialuit Regional Corporation
Inuvik, Northwest Territories

Honourable Nils Clarke

Minister of Environment
Government of Yukon
Whitehorse, Yukon

Dennis Arey

Chairperson
Inuvialuit Game Council
Inuvik, Northwest Territories

July 28, 2021

Re: Approval of Yukon North Slope Wildlife Conservation and Management Plan (2021)

Dear Ministers and Chair,

In furtherance of Section 12(57[b]) of the Inuvialuit Final Agreement (IFA), the Wildlife Management Advisory Council–North Slope is pleased to recommend the Yukon North Slope Wildlife Conservation and Management Plan to you for your approval.

In 1984, the IFA established a special conservation regime for the Yukon North Slope. In addition to the establishment of Ivvavik National Park and Herschel Island–Qikiqtaruk Territorial Park, the Council was created as a part of that regime to prepare and facilitate implementation of a plan for the management of wildlife and conservation on the Yukon North Slope. The development of this Plan reflects the joint management approach between Inuvialuit and federal and territorial governments that was introduced by the IFA. Indeed, the Plan is rooted in the legal foundation of the IFA. The Plan's goals, objectives, strategies and anticipated outcomes are intended as measures to further the implementation of the IFA and the needs of wildlife, habitat, and Inuvialuit users of the Yukon North Slope.

The Plan rests heavily on Inuvialuit knowledge built up over many generations of traditional use and several decades of western science research. The views and contributions of the Council's federal, territorial and community-based management partners and users of the area also deeply informed the Plan. Council undertook extensive consultations on multiple drafts of this Plan in the past three years and have found deep and broad support for the Plan.

The Plan recognizes the long-standing dependence and rights of Inuvialuit to use, manage, and benefit from the Yukon North Slope's resources. It also recognizes the interests of all Canadians in conserving an area of outstanding national and international significance. Importantly, the Plan also addresses the impacts of climate-induced changes that affect and may affect the area today and in the future.

Building on their contributions to the Plan's development, other management partners will continue to play an important role in the Plan's implementation. Based on the Council's management experience of over three decades, we remain confident that our collective commitment to the conservation of the Yukon North Slope will contribute to the successful implementation of the Plan.

Sincerely,



Jennifer Smith, Chair

With concurrence of the outgoing chair, council members, and alternates:

- Lindsay Staples, Past Chair
- Billy Storr, representing Inuvialuit Game Council
- Michell Gruben, representing Inuvialuit Game Council
- Evelynn Storr, representing Inuvialuit Game Council
- Tyler Kuhn, representing Government of Yukon
- Matt Clarke, representing Government of Yukon
- Colleen Arnison, representing Government of Canada
- Craig Machtans, representing Government of Canada

EXECUTIVE SUMMARY

The Inuvialuit Final Agreement (IFA) sets out the requirement for a wildlife conservation and management plan and the vision for the Plan. The goal of the Yukon North Slope Wildlife Conservation and Management Plan (the Plan) is to value and conserve the health of wildlife populations, diversity and productivity, wildlife habitat, and Inuvialuit traditional uses of the Yukon North Slope.

The Plan was developed by the Wildlife Management Advisory Council for the Yukon North Slope (WMAC [NS]), a joint management committee, which has equal Inuvialuit and government representation. The Plan recognizes the collaborative nature of wildlife conservation and management throughout the Inuvialuit Settlement Region (ISR) and builds on important partnerships across jurisdictions for the effective management of transboundary and shared species. The Plan works from principles enshrined in the IFA, including the preservation of Inuvialuit cultural identity and values, their meaningful integration in all aspects of wildlife and land management on the Yukon North Slope, and the equal application of the available Inuvialuit and Western scientific knowledge to achieve conservation objectives.

Inuvialuit are knowledge holders and stewards of the Yukon North Slope. The guiding principles of this Plan are intended to contribute to the protection of Inuvialuit culture and values. The Plan identifies conservation requirements for wildlife and for Inuvialuit traditional use and provides guidance for meeting these needs. The strategies and recommended priorities in the Plan consider wildlife habitats and populations, traditional use, climate change, the regulatory regime, and knowledge building. To provide guidance in implementation, the Plan provides information on how its strategies link with relevant international, national and regional agreements, laws, management arrangements and plans applicable to lands, ocean and species on the Yukon North Slope. When considered together, the guiding principles of this Plan, drawn from the IFA's vision for the Yukon North Slope, result in a management framework wherein Inuvialuit culture, values and economy must be conserved as carefully as wildlife populations and habitat.

Who It Is For

Audiences for the Plan include Inuvialuit beneficiaries, other Indigenous Peoples that use and travel through the Yukon North Slope, researchers, users of the Porcupine Caribou Herd and those interested in its conservation, and people from the Yukon, Northwest Territories, Alaska, and the world with interest in the area, its wildlife and the Inuvialuit people. The Plan will guide work planning and allocation of resources for Inuvialuit organizations, government agencies, and co-management bodies with management responsibilities for the Yukon North Slope.

How It Was Built

The Plan is based on Inuvialuit knowledge acquired over many generations and decades of Western scientific research and monitoring of the Yukon North Slope. Traditional use and traditional knowledge studies were conducted to inform the Plan, and data from other sources such as government wildlife surveys, ecological land classification and habitat mapping added to its development. The Plan provides maps showing ecosystem types, habitat models for featured wildlife species, and maps displaying features of wildlife habitat use. Literature reviews on wildlife species and conservation issues are summarized in the Companion Reports to the Plan.

The Place and People

The Yukon North Slope forms an important interface between land and sea, for people and wildlife. It joins Inuvialuit to relatives in Alaska and Yukon and to familiar harvesting places throughout the region. It bridges the coastal calving grounds of the Porcupine Caribou Herd with important seasonal ranges. It connects protected areas to ensure that wildlife populations are not genetic islands and that, in a changing climate, animals have space to move as habitats shift.

Harvesting of whales, caribou, fish and many other species, gathering with family and friends, and connecting with a shared history and sense of well-being are all regular Inuvialuit practices on the Yukon North Slope. Travel routes, camps, Inuvialuit gravesites, and archeological features are an ever-present reminder of Inuvialuit connection to the Yukon North Slope. This land, coast and ocean have not diminished in importance to Inuvialuit – for many, it is considered home.

The Yukon North Slope is experiencing dramatic climate-driven changes that affect sea ice coverage, permafrost and terrain stability, aquatic and terrestrial ecosystem functions, and the abundance and distribution of wildlife populations. Indigenous food security, which relies on the availability of traditionally harvested wildlife species, is also affected by these dramatic changes. The Plan calls for innovative partnerships among responsible authorities, additional special tools for the protection of critical and important habitats, and tailored approaches to the conservation of Indigenous traditional use, which is central to cultural survival.

Objectives and Strategies

The Plan is organized around five objectives, each with one or more strategies to achieve the objective. The strategies include discussion of the status of current conditions and associated management priorities. Outcomes are articulated for each strategy to aid in Plan implementation.

Objective A:
Conservation Framework

Implementation of a conservation framework, based in the IFA, that includes existing and further effective area-based conservation and economic benefits for Inuvialuit.

Strategies:

- Enhance the conservation framework for Aullaviat/Anguniarvik – the Eastern Yukon North Slope, through the consideration of a formal Inuvialuit-led conservation designation.
- Promote and facilitate initiatives that expand socioeconomic benefits to Inuvialuit, such as developing a Yukon North Slope economic strategy and strengthening a proactive community role in conservation and management on the Yukon North Slope.
- Apply measures to strengthen and streamline interjurisdictional cooperation through strengthening and developing new transboundary and interjurisdictional arrangements.

Objective B:
Wildlife

Conserve habitats that support the diversity and abundance of wildlife populations and habitat on the Yukon North Slope to maintain their quality and long-term productivity and support sustainable harvests that meet Inuvialuit food and cultural needs.

Strategies:

- Integrate conservation requirements for wildlife habitats on the Yukon North Slope into decision-making. This includes protection of caribou calving grounds and summer habitat, as well as conserving large tracts of undisturbed land that encompass diverse ecosystems, and coastal and marine habitat.
- Apply management measures to maintain long-term diversity and productivity of wildlife populations. Maintain an information base on wildlife populations and establish indicators. Include Inuvialuit stewardship and monitoring, and consider threats and status of populations across their whole range.
- Monitor effects of climate change on Yukon North Slope ecosystems. Promote and engage in studies that contribute to understanding and forecasting the effects of climate change on wildlife and habitat. On an ongoing basis, assess options and implement measures for mitigation and adaptation to address climate change effects in the management of wildlife and wildlife habitats.

Objective C:
Inuvialuit Traditional Use

Maintain and enhance Inuvialuit traditional use in the context of changing socio-cultural, economic and environmental conditions.

Strategies:

- Apply management measures to maintain and enhance Inuvialuit traditional use in support of household food security, community health and well-being, and the mobilization of traditional knowledge and skills.
- Employ monitoring and directed research to track and understand current and future effects of climate change on Inuvialuit traditional use of the Yukon North Slope. On an ongoing basis, assess options and implement measures for mitigation and adaptation, to enhance the resilience of traditional use to climate change.

Objective D:
Environmental Protection Measures

Manage risks from human activities to ecosystems and wildlife and to the safety and quality of harvested foods.

Strategies:

- Contribute to improved regulatory decision-making and management policies and processes to conserve the Yukon North Slope environment, wildlife, habitat and traditional use.
- Improve knowledge of risks from contaminants to Arctic wildlife and to the safety of country foods. Consider the risks from contaminants in wildlife population management. Participate in initiatives to reduce risks from contaminants and to alleviate concerns about food safety and wildlife health.

- Prevent pollution and identify local sources of waste that could cause contamination of land or deterioration of water quality. Eliminate and prevent accumulation of non-biodegradable wastes.

Objective E:
Evidence in Support of Decisions

Support evidence-based decisions related to Yukon North Slope wildlife, wildlife habitat and Inuvialuit traditional use by providing accessible information, advice on conservation requirements, and guidance on monitoring and research.

Strategies:

- Maintain and build on the existing knowledge base on wildlife, wildlife habitat, and Inuvialuit traditional use on the Yukon North Slope. Make information available in formats suitable for a range of audiences and provide tools to assist in retrieving and analyzing different types of information.
- Provide guidance for conducting research on Inuvialuit traditional knowledge and use, wildlife, habitat and ecosystems on the Yukon North Slope, including advice on involving communities and reporting on research results.

Implementation

The Plan will guide the parties responsible for implementing this Plan for the next ten years. Implementation will start when the Plan is approved and published.

Appendices: Specific Wildlife Species Conservation Requirements

The Plan provides information on featured wildlife species and species at risk, as well as the conservation requirements for each wildlife species or group of species. These are:

- Tuttu/Caribou
- Tuttuvak/Moose
- Akłaq/Grizzly bear
- Nanuq/Polar bears
- Whales and seals
- Umingmak/Muskox
- Iqaluqpik/Dolly Varden
- Aanahqlik/Broad whitefish
- Geese
- Furbearers
- Imnaiq/Dall's sheep

ACKNOWLEDGEMENTS

Many individuals and organizations have contributed to the preparation of the Yukon North Slope Wildlife Conservation and Management Plan. Regrettably, the Council cannot acknowledge all of them. Much of the Western science and traditional knowledge research that is the evidentiary basis for the Plan reaches back several decades. Appendix Two provides a list of references, and various other plans and strategies listed throughout provide a window into the scope of these contributions.

The Aklavik Hunters and Trappers Committee, its board of directors and resource person, Michelle Gruben, and the community of Aklavik have provided advice in identifying key species addressed in the Plan, their habitat requirements and the needs of Inuvialuit users of the North Slope. The Wildlife Management Advisory Council (Northwest Territories), Fisheries Joint Management Committee, Environmental Impact Screening Committee, Environment Impact Review Board, the Porcupine Caribou Management Board, Gwich'in Renewable Resources Board and Gwich'in Tribal Council have been long-time management partners and their contributions and support are greatly appreciated. Feedback and support from the Aklavik Community Corporation, Aklavik Elders Committee, Inuvik Hunters and Trappers Committee and Community Corporation, and Tuktoyaktuk Hunters and Trappers Committee is also appreciated.

The Inuvialuit Game Council and Inuvialuit Regional Corporation gave close attention and feedback to various drafts of the Plan, and their contributions and support have strengthened it.

Critical reviews by Environment Yukon, Parks Canada, the Canadian Wildlife Service, Fisheries and Oceans Canada have been helpful in addressing a wide-range of terrestrial, aquatic and marine conditions that inform the conservation requirements of the Yukon North Slope. Staff at the Joint Secretariat, including the Traditional Local Knowledge Coordinator, Community-Based Monitoring Program Coordinator, Committee Resource Manager, provided expert advice and feedback.

The principal writer of the Plan was Joan Eamer. A former Council member, she brought a strong knowledge of the Yukon North Slope to the drafting of the Plan, an understanding of the wildlife and people who share and use it, and the challenging impacts they face induced by climate change. Her writing was supported by substantial contributions from Mike Suitor – Environment Yukon biologist, Peter Armitage – cultural anthropologist, Stephen Kilburn – GIS analyst, Kim Heinemeyer – conservation biologist, Julia Smith – GIS analyst, and Will Tyson – cultural ecologist. Bob DeLury – former IFA negotiator and John Donihee – legal counsel – all providing important advice and opinions that inform the Plan. John drafted certain sections of the Plan and reviewed it in its entirety. Evan Pound, Inuvialuit Regional Corporation legal counsel, provided a careful review of the Plan as well. Kirsten Madsen copy edited the Plan.

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The Council's members and alternates, Marc Cattet, Catherine Pinard, Craig Machtans, Billy Storr, Evelyn Storr, and Michelle Gruben devoted many hours to the Plan's development and review. Past Council members have also provided important guidance in the Plan's development. They are Colleen Arnison, Tyler Kuhn, Matt Clarke, Danny C. Gordon, Ernest Pokiak, Billy Archie, Chris Hunter, Gerry Kisoun, Todd Powell, Rob Florkiewicz, and David Tavares.

Kaitlin Wilson and Allison Thompson, Council staff, carried an enormous burden in the resourcing, planning, preparation and review of the Plan. They did so with great commitment and provided expert advice whenever it was needed. Jennifer Smith, former staff member and current chair of the Council, facilitated many of the briefings to and consultations with Plan's management partners and affected community groups and organizations. Former staff members, Christine Cleghorn and Kelly Milner provided considerable support to early planning efforts, including managing knowledge gathering projects.

Lindsay Staples, past Council chair, participated in all aspects of the Plan's development, including funding, engagement of technical consultants, design and drafting, and facilitation and consultation.



Parks Canada/Dave Tavares

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ACRONYMS

COSEWIC	Committee on the Status of Endangered Wildlife in Canada
HTC	Hunters and Trappers Committee
IFA	Inuvialuit Final Agreement
ISR	Inuvialuit Settlement Region
SARA	*Species at Risk Act*
TK	Traditional Knowledge
TU	Traditional Use
WMAC (NS)	Wildlife Management Advisory Council (North Slope)

DEFINITIONS

Selected definitions from the IFA

Conservation	"The management of the wildlife populations and habitat to ensure the maintenance of the quality, including the long-term optimum productivity, of these resources and to ensure the efficient utilization of the available harvest."
Development	"(a) Any commercial or industrial undertaking or venture, including support and transportation facilities relating to the extraction of non-renewable resources from the Beaufort Sea, other than commercial wildlife harvesting; or (b) Any government project, undertaking or construction whether federal, territorial, provincial, municipal, local or by any Crown agency or corporation, except government projects within the limits of communities not directly affecting wildlife resources outside those limits and except government wildlife enhancement projects."
Furbearers	"All species of game that are or may be harvested by trapping . . ."
Preferential right to harvest	"With respect to the Inuvialuit, includes the right to harvest wildlife for subsistence usage and to be allocated, subject to conservation, quantities of wildlife sufficient to fulfil Inuvialuit requirements for subsistence usage before there is any allocation for other purposes in areas where the Inuvialuit will have harvesting rights."
Wildlife	"All fauna in a wild state other than reindeer."

Source: Inuvialuit Final Agreement

ADDITIONAL DEFINITIONS

Adaptive management	"The practice of revisiting management decisions and revising them in the light of new information." (2)
Biodiversity	"The variety of living organisms considered at all levels of organization, including the genetic, species, and higher taxonomic levels; and the variety of habitats and ecosystems, as well as the processes occurring therein." (2)
Biome	"A large, regional ecological unit, usually defined by some dominant vegetative pattern, such as the coniferous forest biome." (2)
Climate change	"Change of climate, which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods." (3)
Ecosystem	"Dynamic complex of plant, animal, microorganism communities and their non-living environment, interacting as a functional unit." (3)
Greenhouse gas	"Atmospheric gas that traps the heat and is responsible for warming the earth and climate change. The major greenhouse gases are carbon dioxide, methane and nitrous oxide." (3)
Habitat fragmentation	"The disruption of extensive habitats into isolated and small patches; or the result of development in a large area where habitat is now fragmented into separate units. . ." (2)
Invasive species	"A non-native species that spreads rapidly and outcompetes, preys on, and otherwise reduces or eliminates populations of native species." (2)
Landscape	"An area sufficient in size, composition, and configuration of land elements (e.g., habitats, management types) to support the long-term persistence and functioning of all conservation features of interest, including ecological communities and processes, ecosystem services, and functional populations of species." (4)
Species	In this Plan we use the term species as it is used by COSEWIC, to mean: "A species, subspecies, variety, or geographically or genetically distinct population of animal, plant or other organism . . ." (1)
Habitat	"Place or type of site where an organism or population naturally occurs." (3)

Sources: (1) (COSEWIC, 2019); (2) (Groom, Meffe, & Carroll, 2005); (3) (UNEP, 2007); (4) (Sodhi & Ehrlich, 2010)



Parks Canada / Jay Frandsen



Parks Canada / Jay Frandsen

> "If you look after the land, it will look after you."
>
> *(Danny C. Gordon)*

Part I.
Introduction

The Inuvialuit Final Agreement (IFA) sets out the requirement for a wildlife conservation and management plan and the Plan's vision, scope and guiding principles (Canada, 1984). This land claim agreement is set out in law enacted by government, and protected by the Canadian Constitution.

The Wildlife Management Advisory Council for the Yukon North Slope (WMAC [NS], the Council) was established through subsection 12(46) of the IFA. Under Subsection 12(57) of the IFA, the council is mandated to "provide advice to the appropriate ministers on all matters relating to wildlife policy and the management, regulation and administration of wildlife, habitat and harvesting for the Yukon North Slope." Paragraph 12(57)(b) of the IFA directs the Council to "prepare a wildlife conservation and management plan for the Yukon North Slope for recommendation to the appropriate authorities as a means for achieving and maintaining the principles of conservation set out in subsections (2) and (3)."

The role and responsibilities assigned by the IFA to WMAC (NS) are to further the broad principles set out in section 1 of the IFA and the special place in that Inuvialuit vision for the Yukon North Slope. Section 12 of the IFA must be implemented in concert with other sections of the Agreement applicable to the Yukon North Slope.

CONSERVATION VISION FOR THE YUKON NORTH SLOPE[1]

Subsections 12(2) and (3) of the IFA establish a regime which guides conservation of wildlife, habitat and traditional use on the Yukon North Slope.

Subsection 12(2):

The Yukon North Slope shall fall under a special conservation regime whose dominant purpose is the conservation of wildlife, habitat and traditional native use.

Subsection 12(3) sets out requirements for screening and environmental impact review of development proposals, and sets specific criteria intended to protect wildlife, habitat and native harvesting when other uses on the Yukon North Slope are proposed and considered by regulators.

1 *The legal framework for the interpretation of a land claim agreement like the IFA requires that it be considered in its entirety. Specific references to IFA provisions in this Plan are provided where appropriate to enhance the reader's understanding of context and the Plan's intent. Words defined in the IFA have the same meaning in this Plan.*

Key Terms of the Plan

The Plan is framed by the IFA's definition of key terms and uses terminology consistent with that of the IFA where applicable.

- **The Yukon North Slope** is defined to include "all those lands between the jurisdictional boundaries of Alaska and the Yukon Territory and the Northwest Territories, north of the height of land dividing the watersheds of the Porcupine River and Beaufort Sea, and including adjacent nearshore and offshore waters and islands" (12(1)).
- **Wildlife** is defined as "all fauna in a wild state other than reindeer," including fish, other marine and freshwater animals, birds, and terrestrial wildlife (2).
- **Conservation** is defined as "the management of the wildlife populations and habitat to ensure the maintenance of the quality, including the long-term optimum productivity, of these resources and to ensure the efficient utilization of the available harvest" (2).
- **Protection** or **Protect** includes any measures or activities intended for the management of the North Slope to
    - prevent the deterioration of an area;
    - ensure the continued biological productivity of an area, including wildlife populations and habitats; and
    - encourage and sustain the exercise of Inuvialuit harvesting rights

  all in a manner consistent with the integrated wildlife and land management regime established in the Inuvialuit Final Agreement and the usage of these terms in the Inuvialuit Final Agreement.

Principles Guiding the Plan

The IFA's stated purposes and provisions provide general guidance for the management of wildlife, habitat, native use and conservation throughout the ISR; some are specific to the Yukon North Slope. Principles 1 to 4, below, are based on key IFA provisions that are reproduced below each principle.

Principle 1. The Plan should be a vehicle for the implementation of the three basic goals of the IFA.

> The basic goals expressed by the Inuvialuit and recognized by Canada in concluding this Agreement are:
>
> (a) to preserve Inuvialuit cultural identity and values within a changing northern society;
>
> (b) to enable Inuvialuit to be equal and meaningful participants in the northern and national economy and society; and
>
> (c) to protect and preserve the Arctic wildlife, environment and biological productivity. (IFA section 1)

Principle 2. To conserve wildlife, Inuvialuit should be integrated into all aspects of Yukon North Slope wildlife and land management.

> It is recognized that one of the means of protecting and preserving the Arctic wildlife, environment and biological productivity is to ensure the effective integration of the Inuvialuit into all bodies, functions and decisions pertaining to wildlife management and land management in the Inuvialuit Settlement Region. (IFA section 14[4])

Principle 3. Where necessary, additional protection measures may be implemented to protect lands important to wildlife.

> It is recognized that in the future it may be desirable to apply special protective measures under laws, from time to time in force, to lands determined to be important from the standpoint of wildlife, research or harvesting. The appropriate ministers shall consult with the Inuvialuit Game Council from time to time on the application of such legislation. (IFA section 14[3])

Principle 4. Both Inuvialuit and Western scientific knowledge must be valued equally and applied to achieve conservation objectives.

The IFA became law in 1984. It has been nearly four decades since the IFA negotiations and the scale and severity of climate change has become evident. Unpredictable weather patterns, eroding coastlines, changing landscapes, and dramatically altered access to harvest areas are a new reality for the Yukon North Slope and its people. A fifth principle has been added to the Plan to address this new reality:

Principle 5. Climate change effects on the Yukon North Slope should be considered in all aspects of wildlife conservation, Inuvialuit traditional use, and management planning.

Goal of the Plan

To value and conserve the health of wildlife populations, diversity and productivity, wildlife habitat, and Inuvialuit traditional uses of the Yukon North Slope.

This goal reflects the IFA's principles as well as its overarching vision for conservation of the Yukon North Slope. This Plan works from the current state of knowledge about wildlife, habitat and Inuvialuit use to provide guidance to all interested parties in support of the goal.

About the Plan

What the Plan Covers

The Plan's scope, goal and guiding principles are based on the Inuvialuit Final Agreement (IFA). The scope is broad in its consideration of species, ecosystems, and cultural ecology. The Plan's geographic scope includes the entire Yukon North Slope and recognizes the range of existing law-based landscape conservation measures that apply to Ivvavik National Park, Herschel Island–Qikiqtaruk Territorial Park, and the Eastern Yukon North Slope.

Wildlife management means maintaining well-functioning ecosystems of which wildlife and humans are a part. This includes conserving areas with important habitats and managing the harvest of species as well as building an understanding of threats and changes to cultural-ecological systems that can be applied to decision-making.

The Plan identifies conservation requirements for wildlife and for Inuvialuit traditional use and provides guidance for meeting these needs. The conservation requirements expressed in this Plan represent the needs of wildlife populations, wildlife habitats and Inuvialuit harvesters applying the best available traditional knowledge and Western science. They include protections identified in the IFA as they apply to ecosystems, wildlife, habitats and the interests of Inuvialuit harvesters.

In developing strategies and recommending priorities, the Plan considers wildlife habitats, wildlife populations, traditional use, climate change, the regulatory regime, and knowledge building. To provide guidance in implementation, the Plan provides information on how its strategies link with relevant international, national, and regional agreements, laws, management arrangements and plans applicable to lands, ocean, and species on the Yukon North Slope.

Inuvialuit are knowledge holders and stewards of the Yukon North Slope. The guiding principles of this Plan, drawn from the IFA, are intended to contribute to the protection and maintenance of Inuvialuit culture and values. Inuvialuit knowledge underlies the Plan, alongside Western scientific knowledge. Where possible, the foundation for the Plan is based on innovative methods of combining Inuvialuit and scientific knowledge to provide a more complete understanding of the Yukon North Slope as it is today.

When considered together, the guiding principles of this Plan, drawn from the IFA's vision for the Yukon North Slope, result in a management framework wherein Inuvialuit culture, values and economy must be conserved as carefully as wildlife populations and habitat. Indeed, they are all intertwined and cannot be considered in isolation. The guiding principles also require that Inuvialuit knowledge and leadership be fully represented in monitoring and management of wildlife and habitat on the Yukon North Slope. The Plan describes the potential of the Yukon North Slope for ecologically grounded, culturally meaningful Inuvialuit economic opportunities, rooted in the guidance of the IFA.

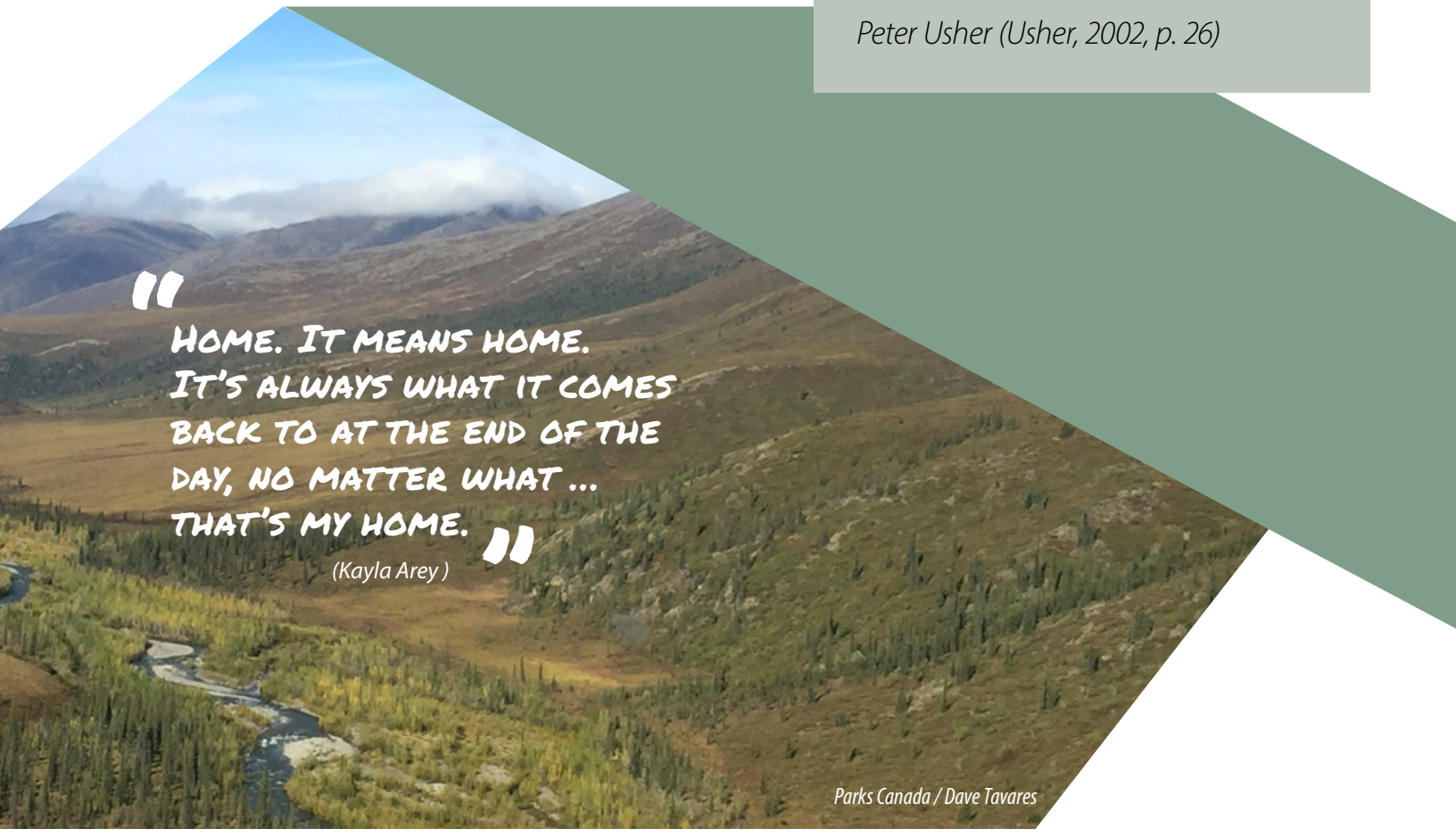


[The Yukon North Slope] means everything to me. It's my place for harvesting, for caribou, moose, ducks … It's a land of plenty … I take the family down quite a bit … My kids are quite aware. They can live if something happens, they know how to make living on the land. They've done it. I've shown them how, what to do, how to do it, so they're thankful for that.

Traditional Knowledge Assessment for Key Species of the Beaufort Sea (Brogan, 2019)

The continued health and abundance of a diversity of species and of the marine and terrestrial environments that support them is as important to Inuvialuit now as it has always been. It would therefore be inappropriate to manage any particular species or environment in isolation, without reference to the effects on overall environmental health and on species and habitat diversity. Resource management must be highly adaptive, and that is what the wildlife and environmental co-management system established by the IFA provides.

Peter Usher (Usher, 2002, p. 26)



Parks Canada / Dave Tavares

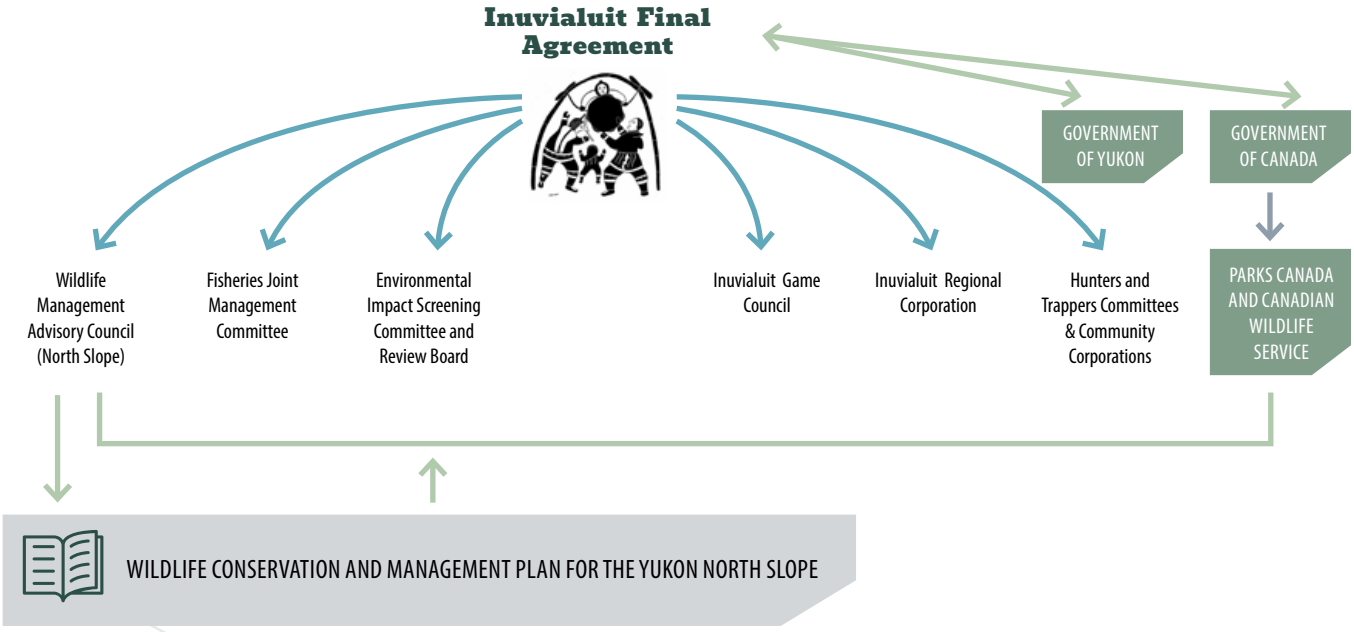
Plan Development

The 2023 Plan was recommended to Parties for signing in 2021. As of December 2023, the Plan was signed by all Parties. This Plan replaces all earlier versions of the Yukon North Slope Wildlife Conservation and Management Plan, including the 2003 Plan. The 2003 Plan informed management for many years. While the principles and objectives remain relevant today, much has changed in the context of the Yukon North Slope. Since the creation of the 2003 Plan, a substantial body of Inuvialuit and Western scientific knowledge about the Yukon North Slope has been documented, which provides much-needed insight into the conservation requirements for the region. The 2023 Plan also considers conservation requirements through the lens of climate change.

The Plan recognizes and is built on the collaborative nature of wildlife conservation and management throughout the ISR – the area of land and water defined and established in the IFA. Conservation and management decisions are made through a joint management system of Inuvialuit and federal and territorial government organizations established under the IFA. Further, it recognizes important partnerships across jurisdictions for the effective management of transboundary and shared species. Plans and programs from outside of the ISR inform this Plan. The Yukon North Slope is situated in a jurisdictionally complex part of the world where coordination and cooperation amongst management bodies is paramount for transboundary species management.

The Plan was developed by the WMAC (NS), a joint management committee, which has equal Inuvialuit and government representation: two members appointed by the Inuvialuit Game Council, one appointed by the federal Minister of Environment, one appointed by the Government of Yukon, and an independent chairperson. The institutional setting of the Plan within the IFA joint management system is shown in Figure 1.

Figure 1. Institutional setting of the Yukon North Slope Wildlife Conservation and Management Plan



Who the Plan Is For

This Plan has multiple audiences:

- Inuvialuit organizations and government agencies with management responsibilities for the Yukon North Slope who will use this Plan to guide their own work planning and allocation of resources;
- Inuvialuit beneficiaries;
- Other Indigenous Peoples that use and travel through the Yukon North Slope;
- IFA co-management bodies (Wildlife Management Advisory Council (North Slope) (IFA 12[46]), Wildlife Management Advisory Council (NWT) (IFA 14[45]), Environmental Impact Screening Committee (IFA 11[5]), Environmental Impact Review Board (IFA 11[22]), Fisheries Joint Management Committee (IFA 14[61]);
- Users of the Porcupine Caribou Herd in the Yukon, Northwest Territories, and Alaska, and others with an interest in conservation of this herd;
- Organizations and agencies conserving and managing wildlife in adjacent areas of the Yukon, Northwest Territories, and Alaska;
- Yukoners, other Canadians, and people throughout the world with an interest in the future of this area and its wildlife;
- Researchers looking to meet conservation and monitoring priorities on the Yukon North Slope in collaboration with local governance and experts.

Engagement and Consultation

The Plan was developed by the WMAC (NS). As such, representatives from the parties to the IFA were engaged in its creation from start to finish. Beginning in 2018, the Council engaged with the community of Aklavik to share progress on the Plan, discuss questions about content and goals, and receive feedback on Plan direction. Sessions included meetings with the Aklavik Hunters and Trappers Committee, the Aklavik Community Corporation, Aklavik Elders, and a public community dinner. The Council met with the Inuvik and Tuktoyaktuk Hunters and Trappers Committees and Community Corporations, as these communities have connections to the Yukon North Slope and address the region in their respective Community Conservation Plans. As the IFA body representing the collective Inuvialuit interest in wildlife and harvesting, including habitat, the Inuvialuit Game Council was involved throughout the Plan development and consultation periods. The Inuvialuit Regional Corporation and the Porcupine Caribou Management Board were also engaged during Plan development.

During the consultation phases, the draft plan was shared with:

- Government of Yukon
- Government of Canada
- Inuvialuit Game Council
- Inuvialuit Regional Corporation
- Aklavik Community Corporation
- Aklavik Hunters and Trappers Committee
- Aklavik Elders Committee
- Tuktoyaktuk Community Corporation
- Tuktoyaktuk Hunters and Trappers Committee
- Inuvik Community Corporation
- Inuvik Hunters and Trappers Committee
- Vuntut Gwich'in Government

- Fisheries Joint Management Committee
- Wildlife Management Advisory Council (NWT)
- Environmental Impact Screening Committee
- Environmental Impact Review Board
- Porcupine Caribou Management Board
- Government of the Northwest Territories
- Gwich'in Tribal Council
- Yukon public

The consultation phases included a 30-day period for the submission of comments from the general public.

Evidence Supporting the Plan

The Plan is based on a substantive body of Inuvialuit knowledge acquired over generations of active, ongoing monitoring and observation and decades of Western scientific research and monitoring of the Yukon North Slope. Emphasis is placed on recent work that builds on a foundation of knowledge gained from previous projects and, especially, on work that combines both Western science-based and Inuvialuit knowledge. The Plan draws from and builds on species and area-based wildlife conservation and management plans.

Projects undertaken by the Council, in consultation with the Aklavik Hunters and Trappers Committee, in preparation for this Plan include the *Yukon North Slope Inuvialuit Traditional Use Study* (WMAC [NS] & Aklavik HTC, 2018b) and *Inuvialuit Traditional Knowledge of Yukon North Slope Wildlife and Habitat* (WMAC [NS] & Aklavik HTC, 2018a). Information from these studies and data from other sources (such as government wildlife surveys, ecological land classification, habitat mapping, and additional Inuvialuit knowledge studies) were integrated to create the most complete picture possible of the distribution of habitats suitable for and used by featured wildlife species and people across the diverse ecosystems of the Yukon North Slope. This work, commissioned by the Council, included development of maps showing ecosystem types, habitat models for featured wildlife species, and maps displaying features of wildlife habitat use. In addition to this analytical work, literature reviews were conducted on wildlife species and issues important for wildlife conservation and management of the Yukon North Slope. The literature reviews are summarized in the Companion Report to the Plan.

Organization of the Plan

The Plan is grounded in the vision, goals and principles expressed in the IFA for the ISR and, more specifically, for the Yukon North Slope. It is organized around five objectives, each with one or more strategies to achieve the objective. The strategies include discussion of the status of current conditions and associated management priorities. Outcomes are articulated for each strategy to aid in Plan implementation.

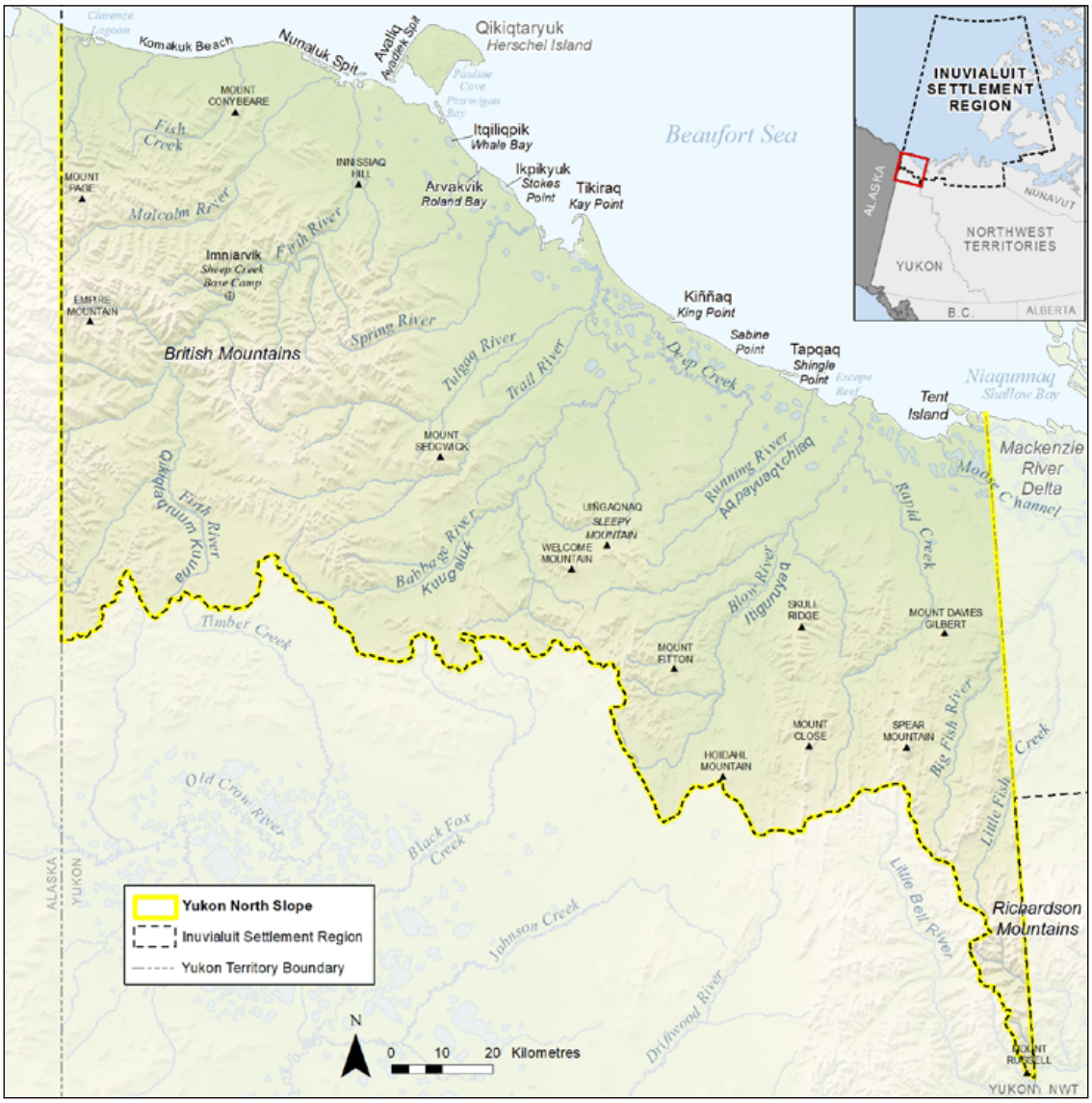
A Note About Language

As a result of colonial practices and other cultural factors, English is now the primary language spoken in Aklavik, the nearest community to the Yukon North Slope. However, some fluent Inuvialuktun speakers remain and there is interest throughout the ISR in revitalizing the language amongst younger generations. The Plan is written in English to make it accessible to the broadest audience possible, but some Inuvialuktun words are used throughout, particularly animal and place names. Unless otherwise indicated, these are in the Uummarmiut dialect spoken by Aklavik Inuvialuit, which is one of three dialects of Inuvialuktun. We acknowledge that there can be

varying Uummarmiutun spellings for certain words; wherever possible, we have used the spelling from Aklavik HTC and WMAC (NS)'s Yukon North Slope Traditional Use Study (2018). In instances where this study did not provide an Uummarmiutun species name, we referred to WMAC (NS) and Aklavik HTC's report, Aklavik Inuvialuit Describe the Status of Certain Birds and Animals on the Yukon North Slope (2003) and the 2016 Aklavik Community Conservation Plan.

THE YUKON NORTH SLOPE

Map 1. The Yukon North Slope



Setting

The Yukon North Slope stretches from the Alaska border to the Northwest Territories border and includes the northernmost part of the Yukon mainland, as well as the adjacent Beaufort Sea and its nearby islands, defined in IFA 12(1). With over 18,000 km^2 of land and 343 km of mainland coastline, the region is characterized by a diverse suite of ecosystems, from mountain ranges to coastal plains to underwater and sea-ice domains.

To the west are the British and Barn mountain ranges and the eastern margin of Beringia, land that remained ice-free in the last glacial period. To the east, shaped by the passage of glaciers, are the gently sloping coastal plains, framed by the Richardson mountains. These elevation gradients provide distinct seasonal vegetation patterns that support a range of wildlife at different times throughout the year. To the north, estuaries, tidal flats, and the Beaufort Sea environment all shape the ecology of the region and influence how humans interact with this environment.

The plants and animals of the Yukon North Slope have evolved to thrive in this landscape. To understand the Yukon North Slope, one must understand the many dynamic relationships at play between unique landscapes, diverse wildlife, and the Inuvialuit who continue to call this place home.

The Yukon North Slope symbolizes connection. It joins Inuvialuit to relatives in Alaska and Yukon and to familiar harvesting places throughout the region. It forms an important interface between land and sea, for people, but also for wildlife like polar bear and waterfowl. It bridges the coastal calving grounds of the Porcupine Caribou Herd with important seasonal ranges. It connects protected areas to ensure that wildlife populations are not genetic islands and that, in a changing climate, animals have space to move as habitats shift.

Thousands of years of change can be read in the rocks and soil and trees. These days environmental processes are moving at a new pace. Climate change is drastically reshaping the face of the planet and the Yukon North Slope is no exception. In fact, temperature records show that warming has been more extreme in this area than in most parts of the world. The region is visibly different from 50 or even 20 years ago. Accelerated coastal erosion, less tundra and more shrubs, and new weather patterns are a few of the changes affecting humans and wildlife. It is projected that change on the Yukon North Slope will continue at a rapid rate.

Inuvialuit Perspectives on the Yukon North Slope

The Yukon North Slope is a living and evolving cultural landscape. Below Inuvialuit share their relationship with this place.

> Pretty much all this area where we go is a special place to us because that's where we get our food from, and we harvest our berries and geese, ducks … right from here [the coast] all the way up to Aklavik.

> Protection of our caribou; that's one thing that really stands out to me, because that's their main route, for their migration [across the Yukon North Slope] …. We've been depending on the caribou herd ever since I was a boy.

> That's where I was taught from our elders how to look after our muktuk, and how to make our dry fish, and passing that tradition on down to my grandkids and my children.

> That's where I get all my winter supplies from. Whaling. Whale, fish, berries and, like a healing place. When you lose a family member, we go down there in the summer …. For me personally, in my life, that's where we go for our healing, when we lose someone.

Excerpts from interviews for Yukon North Slope Inuvialuit Traditional Use Study (WMAC [NS] & Aklavik HTC, 2018b, pp. 100–107)

> **"I think every place is special. Anywhere. Because this is where we were born, and this is where we travel. So everything from Aklavik all the way down, all the way to Kaktovik is special."**

Excerpts from interviews for Yukon North Slope Inuvialuit Traditional Use Study (WMAC [NS] & Aklavik HTC, 2018b, pp. 100–107)

Parks Canada / Jay Frandsen

People on the Yukon North Slope

Archaeological evidence suggests that Inuvialuit are descendants of Thule people who migrated east from what is now Alaska over a thousand years ago. These ancestral Inuvialuit thrived on the North Slope landscape, relying heavily on the Beaufort Sea for food, heat, clothing and travel. By the 1800s, they occupied areas from the Alaskan border to current-day Paulatuk, bringing with them rich cultural practices, including laws, legends and a relationship with the land that fueled trade with neighbours.

The people living on the Yukon North Slope were known as Qikiqtaryungmiut (or sometimes Turyurmiat). They harvested whales, caribou, fish, and other species. They created a network of travel routes, hunting and fishing camps, spiritual places, berry picking places, and other cultural sites. Family stories of this place span hundreds of years and Inuvialuit maintain a strong connection to this place today. Harvesting, gathering with family and friends, and connecting with a shared history and sense of well-being are all regular practices on the Yukon North Slope. The Yukon North Slope represents a seasonal home to many Inuvialuit and remains a central feature of Inuvialuit Nunangat. Travel routes, camps, Inuvialuit gravesites, and



Fritz Mueller / Parks Canada

archeological features are an ever-present reminder of Inuvialuit connection to the Yukon North Slope.

In the late 19th century, European presence became a significant driver of change for the Yukon North Slope and Inuvialuit. Qikiqtaruk (Herschel Island) in particular was a major hub of activity. It was the base for two decades of commercial whaling. While bowhead whales were only hunted in summer, a few hundred to over a thousand people remained on the island each winter. Eventually, the bowhead whale population collapsed, as it had in other places. After many of the whalers left, fur trading grew in economic importance, with a specific reliance on fox. Trade with Barter Island made the Yukon North Slope a hub for travel and hunting activity. Around this time, the Hudson's Bay Company established a trading post on Qikiqtaruk. Colonial institutions arrived along with these industries, including police detachments, missions and residential schools on both Qikiqtaruk and Tapqaq (Shingle Point).

The influx of outsiders brought changes to the marine and terrestrial ecosystems of the Yukon North Slope, including the people who relied on them most. Inuvialuit were exposed to diseases, with impacts that lasted for decades. The Inuvialuit population living along the Yukon North Slope and neighbouring regions was reduced from approximately 2,500 people in 1850 to 250 people in 1905. A second wave of immigration from Alaska occurred after this, bolstering the local population.

Inuvialuit continued to trap throughout the 1900s, although fur prices fluctuated. By the mid-1900s, civilian police were replaced by Canadian military and the Distant Early Warning System was built, followed by the North Warning System in the 1990s. Marine and Mackenzie Delta oil and gas exploration during the 1970s and 1980s altered the local economy and social fabric further, placing more emphasis on wage-based living and large-scale extraction of hydrocarbons. At this time, drill rigs and oil exploration vessels found safe harbour in the Herschel Island basin, supporting offshore oil exploration.

A gradual increase of year-round residents in Aklavik, Tuktoyaktuk and Inuvik marked another significant shift in the human landscape over the course of the mid-to-late twentieth century. Inuvialuit were further subject to the encroachments of colonialist policies and European culture. From residential school to employment in the wage economy, these changes – many of them destructive to Inuvialuit and their culture – limited the ability of Inuvialuit to access the Yukon North Slope for traditional purposes.

Justice Thomas Berger's 1977 Northern Frontier, Northern Homeland: Report of the Mackenzie Valley Pipeline Inquiry brought national attention to the Yukon North Slope. The report gave rise to national recognition of the environmental importance of the area for Porcupine caribou and other wildlife, the cultural significance of the area to the Inuvialuit and Gwich'in peoples, and the value for all Canadians of the land and sea stretching from the Arctic National Wildlife Refuge to the Mackenzie Delta.

Recommendations of the Berger Inquiry (1977) and the provisions of the IFA (1984) have contributed to the protection of the Yukon North Slope in recent decades for wildlife and Inuvialuit traditional use and as a wilderness landscape valued by Yukoners and other Canadians.

In recent decades, non-Indigenous visitors to the Yukon North Slope are mainly researchers, backcountry adventurers, and tourists sightseeing on day trips from Inuvik or travelling by sailboat or cruise ship. Inuvialuit and Gwich'in continue to use the Yukon North Slope as an important place to harvest food as well as visit camps and cabins, and spend time with family in this special place. This land and coast have not diminished in importance to local people. For many it is considered home.



Parks Canada / Jay Frandsen

Part II.
Objectives and Strategies

Objective A.
Conservation Framework Based in the IFA

Implement an integrated conservation management framework for the Yukon North Slope building on the existing conservation regime established in the IFA. This framework includes effective area-based conservation and economic benefits for Inuvialuit.

The integrated conservation management framework for the Yukon North Slope was established in 1984 in the IFA. It includes the Orders-in-Council withdrawing the lands east of the Babbage River from disposition, two wilderness parks, the regulatory regime for the ISR, and a co-management relationship brought to life in the Wildlife Management Advisory Council (North Slope). In 2010, the conservation regime was expanded to include the Tarium Niryutait Marine Protected Area.

The IFA defines the Yukon North Slope as an area that encompasses both land and ocean. It created Ivvavik National Park and Herschel Island–Qikiqtaruk Territorial Park in the western half. It provided for the maintenance of the lands of the Eastern Yukon North Slope for conservation purposes and for development that was compatible with those purposes. It requires that wildlife on the Yukon North Slope be managed on a population basis – one that requires consideration of wildlife-related conditions and impacts that transcend the jurisdictional boundaries of the area. It provides for the application of additional special protective measures required for conservation. It established a regulatory regime for the screening and review of development that is focused on maintaining the highest standards for the conservation of wildlife, habitat and Inuvialuit use on the Yukon North Slope. It established a joint committee of Inuvialuit and federal and territorial government representatives to advise on the management of the area and to prepare a plan that would provide a framework for integrating and implementing these requirements.

This Plan intends just that. The integration of plans and strategies that directly affect conservation requirements on the Yukon North Slope is challenging, though. The collective scope of these plans and strategies encompasses a vast landscape and seascape from the Mackenzie Delta in the Northwest Territories to the Arctic National Wildlife Refuge in Alaska, and from the offshore waters of the Beaufort Sea to Vuntut National Park in the northern Yukon (Map 2).

Wildlife conservation and management of the Yukon North Slope and adjacent lands is jurisdictionally complex. Managing transboundary wildlife populations involves a diverse set

of federal, territorial, state, and Indigenous authorities. The region is also experiencing dramatic climate-driven changes that affect sea ice coverage, permafrost and terrain stability, aquatic and terrestrial ecosystem functions, and the abundance and distribution of wildlife populations. Indigenous food security, which relies on the availability of traditionally harvested wildlife species, is also affected by these dramatic changes. For these reasons, and in the face of much that is uncertain about the pace and scale of changing environmental and economic conditions, management of the area must be precautionary while remaining adaptive. It may require innovative partnerships among responsible authorities, additional special tools for the protection of critical and important habitats, and tailored approaches to the conservation of Indigenous traditional use, which is central to cultural survival. Collateral benefits from management and conforming economic activities can contribute to local and regional household livelihoods and community well-being for present-day and future generations. All of these efforts must proceed within the framework of the IFA, collaboratively with Inuvialuit authorities.

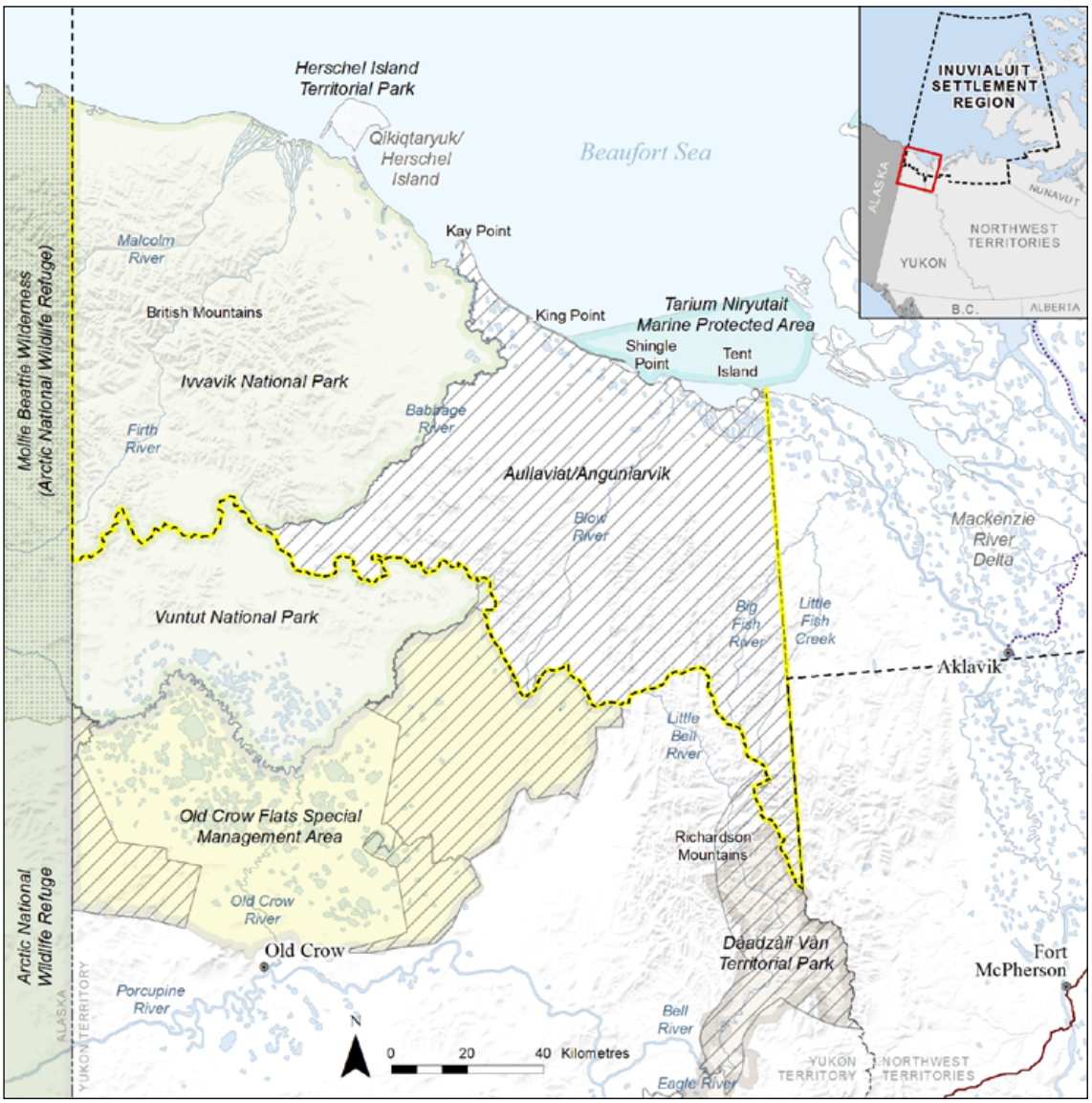
Strategy A1. Aullaviat/ Anguniarvik

Enhance the conservation framework for Aullaviat/Anguniarvik – the Eastern Yukon North Slope.

How this Strategy Contributes to the Plan Goal

The purpose of this strategy is to supplement the conservation regime on the Yukon North Slope by considering a designation that will assist in supporting area-based, proactive conservation of its eastern half. Inuvialuit have named this area, which stretches east of the Babbage River to the border of the Northwest Territories, Aullaviat/ Anguniarvik: where the animals and people travel and where the people harvest. Enhancing the conservation regime of Aullaviat/Anguniarvik, through the consideration of a formal Inuvialuit-led conservation tool, such as an Indigenous Protected and Conserved Area (IPCA) or similar mechanism, would recognize the Inuvialuit intentions for the area, namely conservation of wildlife, habitat and Inuvialuit use, while providing the opportunity for additional economic benefits to Inuvialuit. This type of designation could also provide for a strengthened role for Inuvialuit in the management of the area. This strategy contributes to area-based conservation measures that fulfill the conservation requirements for the area identified in Objectives B and C. It also nests within the existing integrated conservation management framework for the Yukon North Slope.

Map 2. Conservation areas on the Yukon North Slope and surrounding regions



Background

The lands of the Eastern Yukon North Slope have been withdrawn from disposition since 1980. The IFA (section 12[4]) requires the maintenance of that status subject to provisions (sections 12[3] and 12[20]) for future developments which are compatible with those purposes. This 2023 Plan, which recognizes the importance of Aullaviat/Anguniarvik, aims to contribute to the IFA's vision for the area.

Aullaviat/Anguniarvik and the withdrawal order

Pursuant to IFA section 12(4), the lands east of the Babbage River have been withdrawn from disposition through Orders-in-Council that shall be maintained. The "withdrawal order" continues to provide important legal protection for the conservation of wildlife, habitat and Inuvialuit use of the area.

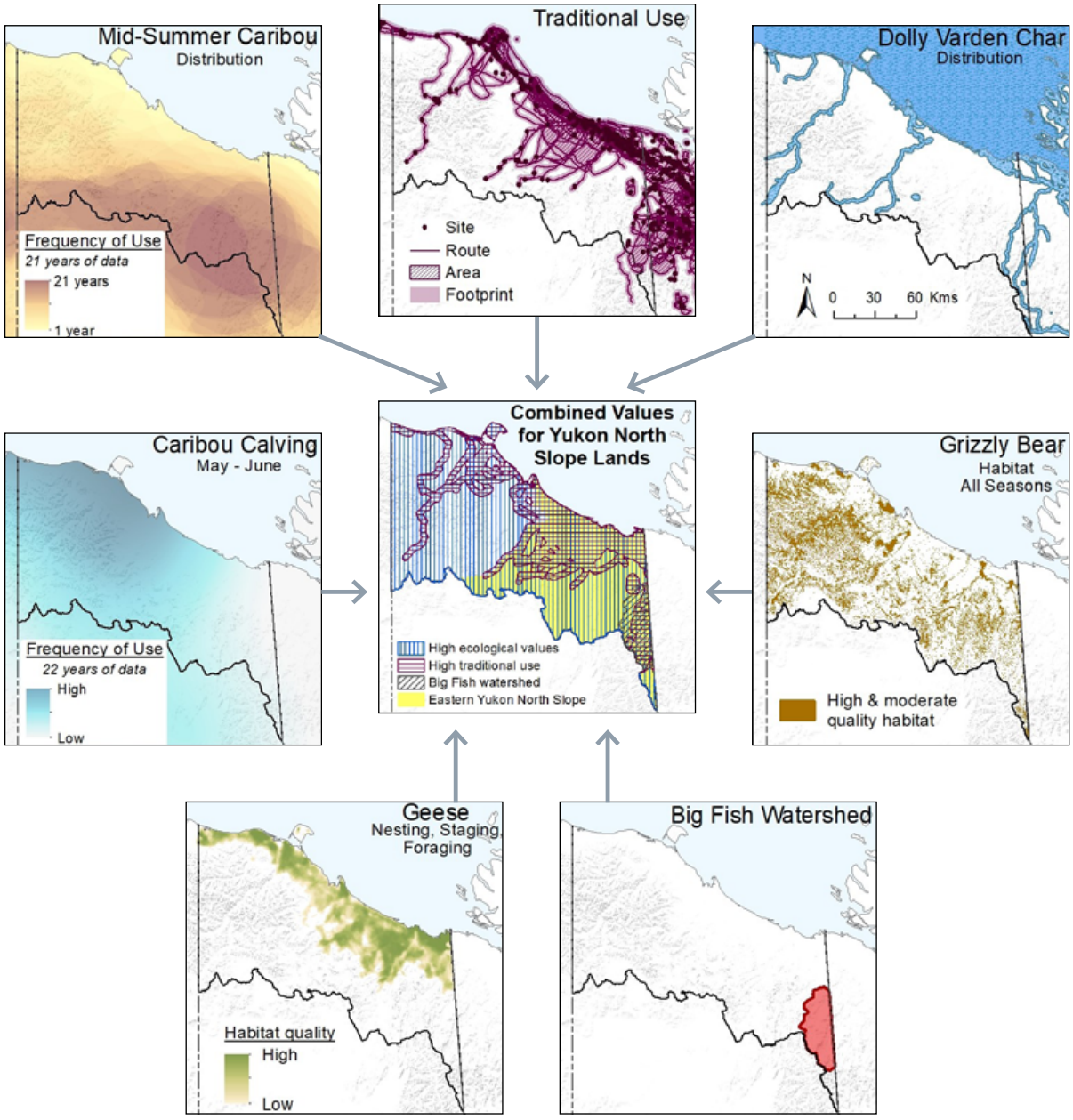
The conservation requirements for Aullaviat/Anguniarvik are based on: the habitat use and requirements of the Porcupine Caribou Herd, grizzly bears, Dolly Varden (known locally as char), and geese; an identified priority on protection of the Big Fish River watershed; and conservation of travel routes, harvesting areas and culturally significant places important for Inuvialuit traditional use (Map 3). These are in addition to the conservation requirements for the Yukon North Slope identified throughout this Plan, including the conservation requirements for featured species summarized in Table 9.

Additional wildlife values identified by the Aklavik, Inuvik and Tuktoyaktuk Working Groups for their respective community conservation plans are: furbearer and waterfowl habitat; geese fall staging areas; swan summer moulting and nesting areas; grizzly bear habitat; Dall's sheep winter range, lambing, and migration corridors; wolf spring and summer denning sites; polar bear winter denning sites; moose and muskox year-round habitat; raptor nesting sites; and Dolly Varden overwintering and spawning at the Babbage River fish hole.

The importance of the Porcupine Caribou Herd

The loss of the Porcupine Caribou Herd to all or parts of the Yukon North Slope would have dramatic consequences for fish, wildlife, and people. With increased likelihood of oil and gas drilling on the Alaskan calving grounds, and with significant uncertainty about the nature and scale of the anticipated impacts on the herd from climate change, it is increasingly important that the Yukon North Slope continue to provide unimpeded passage for caribou and conservation of habitats to meet their year-round needs.

Map 3. Seven key wildlife and traditional Inuvialuit use values across the Yukon North Slope considered individually and as a combined footprint (centre map)



The maps show landscape values (clockwise from centre left): Porcupine Caribou Herd calving habitat and core mid- summer range showing high use areas, based on 22 and 21 years of data respectively; living memory record of Inuvialuit traditional use; rivers that support populations of Dolly Varden; grizzly bear habitat combined for all seasons; the Big Fish watershed, identified in the 2016 Aklavik Community Conservation Plan as an area of high ecological value for Dolly Varden and as of cultural importance; and nesting, staging, and foraging habitat for four species of geese. The central map combines these values for the land area of the Yukon North Slope. Aullaviat/Anguniarvik is highlighted in yellow (Map compiled by WMAC [NS] from various sources).

Priorities

Consider recognition of Aullaviat/Anguniarvik through an Inuvialuit-led conservation designation. Implementing a special conservation tool, like an IPCA or similar mechanism, for Aullaviat/Anguniarvik would reinforce the existing conservation management framework for the Yukon North Slope. It would support the recognition by Inuvialuit and others of Aullaviat/Anguniarvik as an important area for the Porcupine Caribou Herd for calving, post-calving, and late summer habitat, along with a suite of other core values identified throughout this Plan. The recognition of the area through a conservation designation would contribute to ecological and cultural connectivity between existing protected and conserved areas – from the Arctic National Wildlife Refuge across the northern Yukon and into the Mackenzie Delta. Such an initiative would also reflect and support Inuvialuit leadership and innovative management practices. Indigenous-led conservation designations are now better understood and utilized globally. In Canada, Indigenous-led conservation efforts have become a national priority with significant funding available to implement robust Indigenous-led designation, management, monitoring and land-use support programs in special areas.

Outcomes

1) **The IFA-based conservation regime of Aullaviat/Anguniarvik may be augmented** through the designation of an Indigenous Protected and Conserved Area (IPCA) or comparable instrument or supporting legal designation.
2) **Protection of Porcupine Caribou Herd habitat on Aullaviat/Anguniarvik is sufficient** to meet the requirements of the herd and the Indigenous user communities that depend on the herd.
3) **Inuvialuit traditional use of Aullaviat/Anguniarvik is maintained or expanded.** New connections with youth are fostered. The areas critical to Inuvialuit use are protected.
4) **Expansion of the Yukon North Slope economy that secures direct benefits for Inuvialuit**, including those that may be associated with an Inuvialuit-led conservation designation for Aullaviat/Anguniarvik.

Links to Plans and Programs

Several important area management plans contribute significantly to the conservation goal for the Yukon North Slope and support the possible recognition of Aullaviat/Anguniarvik as an Indigenous Protected and Conserved Area that is linked to other adjacent conservation areas (Table 1).

Table 1. Strategy A1: Plans and programs linked to Eastern Yukon North Slope conservation

Plan or Program	Role in Supporting and Enhancing the Conservation Requirements of Aullaviat/ Anguniarvik	Link to Outcomes
Aklavik Inuvialuit Community Conservation Plan *Akaqvikmiut Nunamikini Nunutailivikautinich* (Aklavik HTC, Aklavik Community Corporation, WMAC [NWT], FJMC, & Joint Secretariat, 2016), Inuvik Community Conservation Plan *Inuuvium Angalatchivingit Niryutinik* (Inuvik HTC, Inuvik Community Corporation, WMAC [NWT], Fisheries Joint Management Committee, & Joint Secretariat, 2016), Tuktoyaktuk Community Conservation Plan *Tuktuuyaqtuum Angalatchivingit Niryutinik* (Tuktoyaktuk HTC, Tuktoyaktuk Community Corporation, WMAC [NWT], FJMC, & Joint Secretariat, 2016)	The Community Conservation Plans (CCPs) identify important wildlife habitat and seasonal harvesting areas and make recommendations for their management. The Eastern Yukon North Slope is identified in the Aklavik, Inuvik and Tuktoyaktuk CCPs as a Category E Special Designated Land. Category E is defined as: "Lands and waters where cultural or renewable resources are of extreme significance and sensitivity. There shall be no development on these areas. These lands and waters shall be managed to eliminate, to the greatest extent possible, potential damage and disruption. This category recommends the highest degree of protection in the [CCP]." This legally non-binding designation is the Plan's highest category of protection and is for lands and waters where cultural or renewable resources are of extreme significance and sensitivity.	1, 2, 3
Ivvavik National Park of Canada Management Plan (Parks Canada, 2018)	Provides legal protection of Porcupine Caribou Herd calving grounds and conservation lands for Inuvialuit culture and traditional use, and for wildlife habitats that support a great diversity of wildlife species, on lands adjacent to Aullaviat/Anguniarvik.	1, 2, 3
Herschel Island–Qikiqtaruk Territorial Park Management Plan (Herschel Island–Qikiqtaruk Management Plan Review Committee, 2018)	Provides legal protection of important Inuvialuit cultural sites and wilderness to the same standard as Ivvavik National Park.	3
Tarium Niryutait Marine Protected Areas Monitoring Plan (DFO, 2013)	Establishes conservation requirements and certain legal protections of important beluga habitat and migration routes.	3
Integrated Ocean Management Plan for the Beaufort Sea (Beaufort Sea Partnership, 2009)	Identifies environmentally sensitive areas and important habitats for conservation in the adjacent coastal zone.	3

Table 1. Continued

Plan or Program	Role in Supporting and Enhancing the Conservation Requirements of Aullaviat/ Anguniarvik	Link to Outcomes
North Yukon Regional Land Use Plan (Vuntut Gwitchin Government & Government of Yukon, 2009)	Establishes area-based land use designations that protect the Porcupine Caribou Herd range (with the future health of Porcupine caribou being a major concern identified in planning) and habitat important to other wildlife species. While unlikely, planning of a proposed transportation corridor to the Yukon North Slope would need to consider the Summit Bell Protected Area established under the North Yukon Regional Land Use Plan.	2
Vuntut National Park of Canada Management Plan (Parks Canada, 2010)	Establishes legal protection of certain Porcupine caribou range and adjacent conservation lands that support a great diversity of wildlife species.	2
Arctic National Wildlife Refuge Comprehensive Conservation Plan (USGS & USFWS, 2015)	Recommends wilderness areas and rivers for designation from six scenarios for refuge management.	2

Strategy A2. Yukon North Slope Economy

Promote and facilitate initiatives that expand socioeconomic benefits to Inuvialuit and other communities and businesses, while meeting the conservation requirements of the Yukon North Slope.

How this Strategy Contributes to the Plan Goal

The creation of Yukon North Slope-based economic benefits supports the goal of this Plan and the principles of the IFA through:

- strengthening Inuvialuit management of the Yukon North Slope for conservation purposes, consistent with the IFA (12[2]);
- creating additional opportunities for Inuvialuit to be meaningful participants in the local and regional economy;
- strengthening traditional-use practices, knowledge, and skills through increased time on the land;
- supporting Inuvialuit leadership in research and monitoring required for the protection of the wildlife and environment of the Yukon North Slope; and
- supporting economic stability and resilience while generating socio-cultural benefits for Aklavik and the ISR in the face of climate change and uncertain resource-sector cycles.

Background

The Yukon North Slope provides habitat for over 50 harvested wildlife species that directly contribute to Inuvialuit food security and material well-being (Inuvialuit Harvest Study, 2003). All of these species provide, either directly or indirectly, the traditional foods central to Inuvialuit households. They represent nutritional value superior to many expensive store-bought foods and a significant non-cash substitute for purchased foods. In Aklavik, where (2016) annual median household incomes are approximately 25% lower than the Canadian equivalent and the cost of living is considerably higher, these economic contributions are especially significant.

High-profile species like grizzly bear and polar bear and, importantly, furbearers like wolverine, fox, wolf and mink provide some cash income through commercial sales. Today, these sales are a small fraction of what they once were prior to the 1980s.

Currently, government employment, land claims implementation, service sector-related businesses, and negotiated funding from the signed land claim agreement remain important sources of income for many households in Aklavik, Inuvik, and Tuktoyaktuk.

After nearly four decades, tourism on the Yukon North Slope remains in the early stages of development and is largely confined to the two parks. Several commercial and private rafting and hiking trips occur annually in Ivvavik and periodic day-flight tours reach Herschel. In recent years Qikiqtaruk has emerged as an attractive site visit for cruise ships transiting Arctic summer waters. Local and regional benefits from all these activities have been limited. A few Yukon-based firms offer outdoor adventure packages, and Inuvialuit-based tourism businesses in the area are confined to a few individuals who provide excursions by dog sled and boat or provide support services to other operators in the form of cultural interpreters, cooks, and camp staff.

While Inuvialuit have been leaders in environmental management and economy on the Yukon North Slope since their arrival many generations ago, the IFA established an additional legal basis for Inuvialuit participation in opportunities associated with the area generally. Ivvavik National Park and Herschel Island–Qikiqtaruk Territorial Park represent important opportunities in this regard, providing employment

and procurement benefits through their capital and operational expenditures. However, their distance from the user communities of Aklavik, Inuvik and Tuktoyaktuk make them challenging and expensive to travel to and, aside from direct parks employment, contracting opportunities are largely seasonal. Expanded Inuvialuit benefits from park-related economic activities and management have been identified as strategic priorities in both park management plans.

Community and regional organizations established under the IFA, such as the Inuvialuit Regional Corporation, the Inuvialuit Development Corporation and its subsidiaries, community corporations, hunters and trappers committees, and co-management bodies have created significant employment and income-related opportunities for Inuvialuit. They provide the foundation from which to expand these opportunities through their own direct investments and through partnerships and cooperative arrangements with governments and industry. Informal initiatives, like HTC-required bear monitors for field projects, also provide economic opportunities via these organizations.

Aullaviat/Anguniarvik has no formal conservation designation or area-specific management regime under the IFA. Employment opportunities are incidental to wildlife management and research programs. While Aullaviat/Anguniarvik, given its proximity to the user communities, holds great potential for enhanced Inuvialuit participation in traditional use, conservation management, and economic opportunities, to date the area has provided little formal means for taking advantage of these benefits. Building on the existing economic foundation outlined above, the creation of a long-term, Inuvialuit-led trust fund would provide the means to expand current opportunities on the Yukon North Slope, with a particular focus on Aullaviat/Anguniarvik.

Any additional economic opportunities in this area would respect and support the conservation requirements for wildlife and traditional use as identified in this Plan and contribute to the goals in Section 1 and Section 12 of the IFA. Management of these resources provides opportunities for important collateral economic benefits to Inuvialuit communities.

Priorities

Develop and implement a Yukon North Slope economic strategy consistent with the conservation requirements of the area and the IFA. A strategy to expand the Yukon North Slope economy will identify areas for enhancement of existing opportunities and create new ones through partnerships of federal and territorial departments and agencies and Inuvialuit organizations and, where appropriate, non-governmental interests. The establishment of an Inuvialuit-led trust fund could provide the means for stable, long-term implementation of this strategy.

Strengthen a proactive community-based role in the conservation and wildlife management of the Yukon North Slope. This includes the co-production of knowledge with collateral economic benefits through sustainable funding dedicated to building community capacity and participation in area-based research and monitoring. The expansion of guardian monitoring programs, and Inuvialuit participation as co-managers and co-researchers in area operations and field programs represent important initiatives to build community capacities with collateral economic benefits.

Outcomes

1) Inuvialuit leadership and participation in a Yukon North Slope economy have increased, and mechanisms for the capture of related economic benefits have been strengthened.
2) The value of economic benefits from Yukon North Slope activities (such as ecotourism, park employment, wildlife management, research and monitoring) has increased, especially for Inuvialuit.

Links to Plans and Programs

A few existing plans address aspects of economic benefits related to development of an enhanced economy (Table 2). The priorities and outcomes above are presented in the context of these existing plans and programs.

Table 2. Strategy A2: Plans linked to supporting development of a Yukon North Slope economy

Plan or Program	Role in Supporting Development of a Conservation-based Economy	Link to Outcomes
Place-Based Plans		
Herschel Island-Qikiqtaruk Territorial Park Management Plan (Herschel Island-Qikiqtaruk Management Plan Review Committee, 2018)	Establishes commitments to enhancing Inuvialuit economic benefits through employment and procurement opportunities associated with park operations, research and monitoring, and tourist-related opportunities (Plan 11.4).	**1, 2**
Ivvavik National Park of Canada Management Plan (Parks Canada, 2018)	Establishes commitments to enhancing Inuvialuit economic benefits through employment and procurement opportunities associated with park operations, research and monitoring and tourist-related opportunities (Strategy #3).	**1, 2**
Strategies and Policies		
Inuvialuit Regional Corporation Strategic Plan 2019 to 2021 (IRC, 2019)	Speaks to IRC policy and role in Inuvialuit cultural (including traditional use) revitalization, and economic diversification.	**1, 2**

Strategy A3.
Interjurisdictional Cooperation

Apply measures to strengthen and streamline interjurisdictional cooperation for the management of wildlife, habitats, and traditional use on the Yukon North Slope and to address related stressors and impacts that originate outside the area.

How this Strategy Contributes to the Plan Goal

Work through this strategy contributes to a coordinated approach and integrated framework for management and conservation of wildlife, wildlife habitats, Inuvialuit traditional use, and management of other uses on the Yukon North Slope.

Background

The jurisdictional context for wildlife management on the Yukon North Slope is complex. Many wildlife populations occupy areas of multiple federal and territorial jurisdictions, both on land and at sea. They may extend beyond the boundaries of the Yukon North Slope to other regions of the Yukon, to lands or marine areas in the NWT, Alaska and beyond, and to other land claim settlement areas and traditional territories. Levels of inter-jurisdictional cooperation that have often proved challenging to achieve are required to ensure: the success of habitat, population, and harvest management actions; the effectiveness of conservation strategies; the avoidance or mitigation of adverse transboundary impacts from resource development; and mitigation of other stressors such as climate change.

What does conservation mean under the IFA?

Conservation means the management of the wildlife populations and habitat to ensure the maintenance of the quality – including the long-term optimum productivity – of these resources, and to ensure the efficient utilization of the available harvest.

Recommendations by national bodies such as the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and countries that are signatories to international conventions and agreements, such as the *Convention for the International Trade in Endangered Species* (1975) and the *International Agreement for the Conservation of Polar Bear* (1973), affect wildlife management decisions and the rights of Inuvialuit and other wildlife harvesters on the Yukon North Slope. This is true even in circumstances where extra-territorial interests and oversight are half the world away. The Arctic Environmental Protection Strategy (1991), its successor institution, the Arctic Council (1996), and its working groups and programs establish commitments by Canada and recognize the interests of Yukon and other territorial jurisdictions, as well as the rights and contributions of the Inuvialuit and other Inuit peoples. These working groups and programs include the Conservation of Arctic Flora and Fauna, Protection of the Arctic Marine Environment, Emergency Prevention, Preparedness and Response, Sustainable Development Working Group, and Arctic Monitoring and Assessment Programme.

Yukon North Slope wildlife conservation depends heavily on working together, while empowering the existing IFA management structure. Local engagement and upholding community values and priorities, like those captured in the Inuvialuit Community Conservation Plans, is essential. Cooperative research and monitoring programs and the mutual support of traditional and scientific knowledge also contribute to successful management. Sharing resources is very important in this remote region where the cost of conducting such programs is high and the environmental conditions uncertain. Interjurisdictional engagement and cooperation from local to international levels are imperative to achieving the conservation goal of this Plan. They rest on a shared understanding and acknowledgement of the Inuvialuit governance and joint management regime established by the IFA.

Priorities

Strengthen transboundary and interjurisdictional arrangements as they affect the conservation requirements of the Yukon North Slope and develop strategies for improvements where warranted. Institutional arrangements and relationships that may require attention periodically include the Canadian Polar Bear Technical and Administrative Committees, COSEWIC and related species specialist committees, ISR wildlife and harvest management planning, the Beaufort Sea Partnership, and participation in forums such as meetings of the Polar Bear Range States, conferences of the Convention for the International Trade in Endangered Species, and Arctic Council programs.

Develop new transboundary and interjurisdictional arrangements where needed, both in the ISR and outside. Consider legal and administrative instruments and forums as appropriate, to strengthen shared management approaches affecting Yukon North Slope wildlife, wildlife habitats, and harvesting. Regional programs and organizations with overlapping management mandates and research interests include the Yukon Fish and Wildlife Management Board, the Fisheries Joint Management Committee, Arctic National Wildlife Refuge and Northern Yukon land and conservation planning, and species-specific research and monitoring, such as for Porcupine caribou, polar bears, grizzly bears, muskox, and Dall's sheep. Building on the ISR Southern Beaufort polar bear tag administration model (wherein Yukon and NWT have harmonized their regulations so that Inuvialuit harvesters can use the same tag for polar bear harvest in both territories), similar approaches for other transboundary quota species may be warranted.

Outcomes

1) Agreements, plans and arrangements between jurisdictions and management bodies effectively manage shared wildlife populations for which there are conservation concerns and overlapping interests.

2) Federal and territorial governments, Inuvialuit organizations, and co-management boards demonstrate coordinated efforts and actions in wildlife and habitat research and monitoring, and harvest management on the Yukon North Slope.

Links to Interjurisdictional Bodies and Forums

Table 3 summarizes key organizations and forums requiring interjurisdictional cooperation for shared Yukon North Slope wildlife populations.

Table 3. Strategy A3: Management arrangements for interjurisdictional cooperation

Organization/Forum	Role in Shared Population Management	Link to Outcomes
Area-based		
Wildlife Management Advisory Council (North Slope) and (NWT); Inuvialuit Game Council	Joint meetings throughout the year to address matters of shared management interest and concern on both sides of the Yukon/NWT border in the Inuvialuit Settlement Region.	2
Fisheries Joint Management Committee	Advises the Minister of Fisheries and Oceans on matters related to Inuvialuit and ISR fisheries.	1
Environmental Impact Screening Committee and Review Board	Recommends to the appropriate authorities terms and conditions resulting from the screening and assessment of proposed developments in the ISR.	1
Yukon Fish and Wildlife Management Board	A Yukon-wide public board that makes recommendations to the Minister of Environment, Yukon First Nations, and Renewable Resources Councils on all matters related to fish and wildlife management, legislation, research, policies and programs.	1
Beaufort Sea Partnership	Primary forum for stakeholder engagement in integrated ocean management of the Beaufort Sea Large Ocean Management Area with broad stakeholder representation from 54 different regional organizations.	1
Species-based		
Committee on the Status of Endangered Wildlife in Canada	Independent advisory panel that meets twice a year to assess the status of wildlife species at risk of extinction in Canada.	1

Table 3. Continued

Organization/Forum	Role in Shared Population Management	Link to Outcomes
Species-based		
Canadian Polar Bear Administrative Committee and Canadian Polar Bear Technical Committee	Forums of representatives of federal, territorial and provincial governments, Indigenous authorities and wildlife management bodies. The administrative committee shares and coordinates information, management objectives, and policy for Canada's polar bear populations. The technical committee undertakes an annual assessment of Canada's 13 polar bear populations and provides technical advice to the administrative committee.	1
Polar Bear Range States	Biennial meeting of signatories to the 1973 Agreement on the Conservation of Polar Bears (Norway, Canada, Greenland, the Russian Federation, and the United States) to coordinate circumpolar polar bear management.	1
Inuvialuit–Inupiat Southern Beaufort Polar Bear Commission	Annual meeting of Inuvialuit and Inupiat representatives to address population and harvest management and research of Southern Beaufort polar bears.	1
Porcupine Caribou Management Board (PCMB) and International Porcupine Caribou Board	The PCMB is a co-management board of Canada, Yukon and NWT governments and Indigenous authorities that advises on herd management across its range. The international board administers the bilateral agreement between Canada and the United States (1987) and provides advice to governments on conservation of the herd and its habitat.	2

Objective B. Wildlife

Conserve habitats that support the diversity and abundance of wildlife populations and habitat on the Yukon North Slope to maintain their quality and long-term productivity and support sustainable harvests that meet Inuvialuit food and cultural needs.

Conservation of wildlife is at the heart of this plan and is integral to conserving Inuvialuit traditional use (Objective C). The Yukon North Slope is recognized as important for wildlife within the Inuvialuit Settlement Region, within Canada, and on a global scale, by virtue of its landscape diversity, its natural state, and the long tradition of valuing and caring for the land and animals. Strategies to conserve these values centre on identifying and conserving wildlife habitats (Strategy B1) and managing wildlife populations (Strategy B2). Strategies B1 and B2 consider the challenges posed by multifarious landscape change over the ranges of wildlife populations frequenting the Yukon North Slope. Strategy B3 consolidates approaches to addressing climate change effects on wildlife. Objective A speaks to the higher-level tools that provide the conservation foundation for the priorities presented in the following strategies.

Strategies to achieve this objective feature selected wildlife species and groups of species (Table 4). The featured species were selected with the aid of a workshop held in Aklavik (WMAC [NS] & Aklavik HTC, 2018a). The wildlife species selected:

- have high cultural or economic value, or are important as food for Inuvialuit;
- have similar habitat needs to other wildlife species, so that conserving their habitat will also conserve habitat for other species; and
- hold an essential role in healthy ecosystems, such as species that are important food sources for top predators.

Whales were added to the initial list to better capture Yukon North Slope marine habitats. All selected wildlife species have high cultural importance to Inuvialuit. Several additional species and species groups were identified as of special interest to the Inuvialuit but are not included in the Plan's featured species. These are: berries, herring (Arctic cisco) Qaaqtaq, loche (burbot) Titaalirq, shorebirds, swans, ducks, loons, ptarmigan, and raptors (birds of prey).

It's recognized that there are a multitude of other species, both plants and animals, on the Yukon North Slope that have their own distinct conservation requirements. Some are managed through the federal *Species at Risk Act* (SARA) (see Table 18 in Species at Risk), while others will benefit from the conservation requirements of the Featured Species in this Plan. Addressing all Yukon North Slope species is outside the scope of this Plan. It is also beyond current financial and human capacity to monitor and manage the full suite of wildlife that call the Yukon North Slope home. It is expected that the conservation requirements for Featured Species, and the recommended enhanced area-based conservation framework will contribute to broad conservation of the diversity and abundance of wildlife populations and habitats on the Yukon North Slope.

Underlying the diversity of wildlife is the diversity of ecosystems. Terrestrial ecosystem types across the Yukon North Slope are shown in Map 4 as identified by Inuvialuit classification of Western science-based ecosystem mapping. These ecosystem types integrate Inuvialuit traditional knowledge with Western science to identify ecosystems not solely based on vegetation classes – they integrate many features, including elevation, water, terrain, soils and aspect. Ecosystem mapping was completed separately for Ivvavik National Park, Qikiqtaruk–Herschel Island, and Aullaviat/Anguniarvik. The resulting ecosystem types were used in developing models for Featured Species and descriptions of terrestrial wildlife habitats in this Plan.

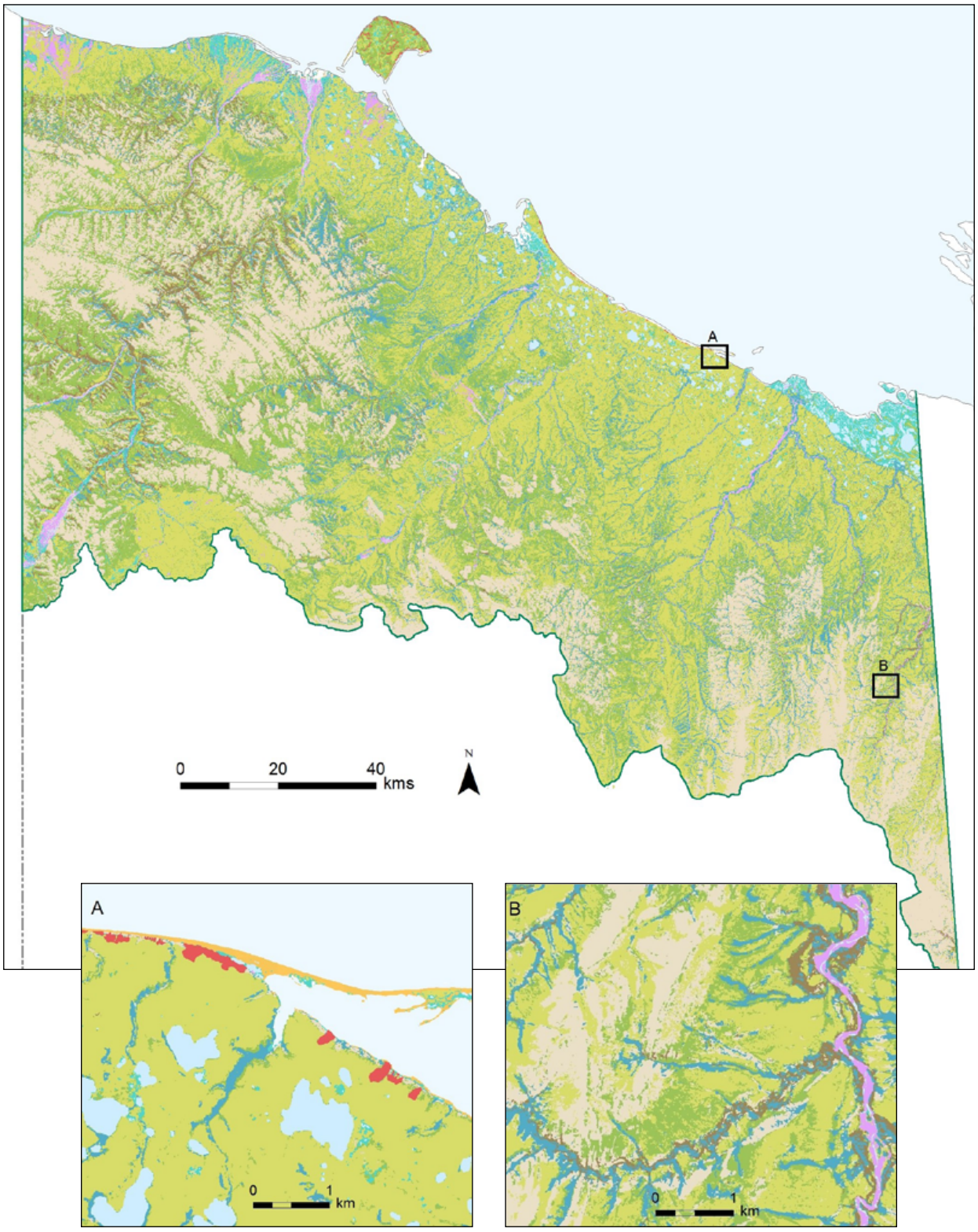
Table 4. Featured wildlife species

Featured Species	Important Ecosystems on Yukon North Slope
Species-based	
Caribou/Tuttu (Porcupine Caribou Herd)	Spans terrestrial ecosystems
Moose/Tuttuvak	Rivers and creeks, swamps, areas with willows
Grizzly bear/Akłaq (Western Canada population)	Spans terrestrial ecosystems
Polar bear/Nanuq (Southern Beaufort Sea subpopulation)	Coastal, nearshore marine, sea ice, hillsides (for inland denning)
Whales and seals: bowhead whale/Arviq (Bering–Chukchi-Beaufort population); beluga whale/Qilalugaq (Eastern Beaufort Sea population); ringed seal/Natchiq; bearded seal/Ugruk	Nearshore and offshore marine areas, including Mackenzie estuary
Dolly Varden/Iqaluqpik (locally known as char) (populations spawning in several Yukon North Slope rivers and Mackenzie River tributaries)	Rivers and headwater creeks, nearshore marine
Broad whitefish/Aanahqlik (populations spawning in the Mackenzie River system)	Lakes and ponds, fresh and brackish nearshore marine
Geese: Snow Goose/Kanuq (Western Arctic lesser snow goose); Brant/Niggilingaak (Black Brant); yellowlegs/Niggliq (mid-continent greater white-fronted goose); Canada goose/Uluagullik	Swamps, estuarine and nearshore marine areas, hillsides (for berries)
Furbearers: wolf/Amaguk; wolverine/Qavvik; Arctic fox/Tigiganiak; red fox/Kayuqtuq; snowshoe hare/Ukalliq	Depends on the species, but together span terrestrial ecosystems and venture on to sea ice
Dall's sheep/Imnaiq (populations in British Mountains and northern Richardson Mountains)	Rocky mountain ridges, hillsides
Muskox/Umingmak (population with range in northeastern Alaska, northern Yukon, and east to the Mackenzie River)	Tundra/low flatlands, rocky mountain ridges; spans terrestrial ecosystems

Map 4. Terrestrial ecosystem classification map for the Yukon North Slope

Ecosystem Classes Informed by Science and Traditional Inuvialuit Knowledge





Inset maps A and B illustrate the level of detail possible at a finer scale.

Strategy B1. Wildlife Habitats

Integrate conservation requirements for wildlife habitats on the Yukon North Slope into decision-making.

How this Strategy Contributes to the Plan Goal

Work under this strategy consolidates the best available information from Inuvialuit traditional knowledge and Western scientific knowledge to identify conservation requirements for wildlife habitats. The strategy provides guidance on priorities for protecting wildlife habitats from degradation and disturbance due to human activities, as well as priorities for monitoring and forecasting changes in habitat suitability and use.

Background

Information on suitable and occupied habitats for featured wildlife species was compiled to aid in identifying habitat values and conservation requirements for conserving these values. Highlights and summaries are presented for featured species in Appendix 1. Information sources include Inuvialuit traditional knowledge, survey results and research findings. Further information is in the species chapters of the Companion Report and in species habitat maps in the Atlas.

Interviews, workshops and meetings provided information about Inuvialuit traditional use patterns and knowledge about wildlife species' seasonal movements and use of habitats. Where feasible and appropriate, Inuvialuit traditional knowledge was integrated with other types of information for analyses and mapping. The map of ecosystem types (Map 4) is based on a combination of mapping derived from satellite imagery, ground-truthing, and Inuvialuit experts' classification of habitats. The traditional knowledge-based habitat suitability models shown on some of the featured species maps combine the distribution of ecosystem types shown in Map 4 with traditional knowledge holders' observations and judgements about what habitat types are important for wildlife species over their annual cycle, including for feeding, migrating, breeding and raising young, and escaping predators.

Wildlife habitat includes:

- Suitable habitat for a wildlife species or groups of species. Habitat suitability varies from season to season. Some types of habitat, such as habitat suitable for denning, may be more restricted or more critical for one species than others.
- Occupied or used habitat. Species or groups of species are known to make use of this habitat, year-round, or during certain seasons.
- Habitat that provides connections for wildlife, such as migration routes.

Priorities

These priorities are based on themes common among the key habitat conservation requirements identified for Featured Species (Appendix 1).

Protect caribou calving and post-calving grounds and summer habitat to support the needs of the Porcupine Caribou Herd and Inuvialuit and other harvesters. Caribou are a key ecosystem driver, modifying landscapes, supporting predators, and cycling nutrients. They are the most important of the Yukon North Slope's wildlife species for Inuvialuit harvest. While core areas can be identified for calving and post-calving periods based on past use, the herd's pattern of habitat use varies from year to year and the landscape is being transformed due to climate change. Additional protection methods could provide options for caribou in habitat availability, especially given the increasing evidence of the critical importance of summer habitat for caribou health, and options for access to this important resource for Inuvialuit harvesters.

Conserve large tracts of undisturbed land that encompass diverse ecosystems, which are required by wide-ranging terrestrial species, like caribou and grizzly bears (Map 3). Habitat connectivity and maintenance of quality habitats extending over large areas with a range of conditions will become increasingly important as climate change progresses and ecosystems change. The existing integrated conservation management framework supports this priority, in part. Building on this framework in Aullaviat/Anguniarvik would provide valuable additional recognition of connectivity across the Yukon North Slope landscape.

Conserve specific habitat types and areas that are vital for wildlife populations. Some species have crucial habitats that must be conserved for the population to thrive, such as caribou calving grounds, bear denning sites, raptor nest sites, escape cliffs used by sheep, and char overwintering areas. Critical features and areas will shift with time, and some may become more important due to effects of climate change or other stressors. For example, caribou calving areas in the Yukon may become more critical if caribou are displaced by drilling in Alaska, and polar bears may rely more on land sites for denning and as summer habitat as seasonal sea ice shrinks.

Conserve the diverse Yukon North Slope marine ecosystems. This includes protection for areas identified as high value for species, such as nearshore waters important for anadromous fish feeding and migration, ringed seal breeding areas, and beluga calving and summering in Niaqunnaq. Other important marine habitat types shift location with the seasons and with ocean and sea-ice conditions, such as areas with upwelling that supply high concentrations of food for bowhead whales, and ice-edge feeding locations for polar bears. Management of the nearshore and offshore marine areas of the Yukon North Slope must be adaptive, as seasonal patterns of habitat availability are changing due to effects of climate change, including loss of sea ice. Habitats may also be affected in the future by increased ship traffic and potential oil and gas developments. The regulatory regime provides a toolkit for conserving the Yukon North Slope marine area. Tarium Niryutait Marine Protected Area layers additional protections.

Conserve the coastal region where land, sea, and rivers meet. The diverse and productive coastal ecosystems, including estuaries, salt marshes, and beaches, are particularly vulnerable to effects of climate change and risks from marine development and activities. Marine habitat quality is linked to events and changes on land, and vice versa. The coast is a focus of traditional use because so many wildlife species are in the coastal region for at least part of the year, foraging and moving among habitats in the sea, on sea ice, in estuaries, and on land.

Maintain the information base on wildlife–habitat relationships. This includes ongoing monitoring of habitat use and modelling of habitat requirements. Additional and ongoing knowledge documentation is needed to improve management of wildlife habitat and understanding of how habitat use is changing in relation to the effects of climate change.

Outcomes

1) Protection of habitat for the Porcupine Caribou Herd is enhanced. In particular, caribou calving and summer ranges on Aullaviat/Anguniarvik are protected.
2) Conservation requirements for wildlife habitat that are identified in this Plan are incorporated into management plans and used to inform decisions and assess risks to wildlife from climate change and from developments and other activities. Habitat conservation requirements are updated as conditions change and as further knowledge is acquired.
3) Maps and descriptions of habitat suitability and habitat use for the species featured in this Plan are available to support work on habitat conservation. Habitat information is also compiled for other species, or for multiple species in areas of the Yukon North Slope, where a need is determined by conservation priorities.
4) Conservation requirements for wildlife habitat inform the setting of priorities for research and monitoring.

Links to Plans and Programs

Aspects of wildlife habitat, including priorities for conservation, are central to many plans and programs. Table 5 summarizes these by type. See Table 7 in Strategy B2 for a fuller listing of species management plans.



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Table 5. Strategy B1: Plans and programs linked to conservation of wildlife habitats

Plan or Program	Role in Conservation of Wildlife Habitats	Link to Outcomes
Place-Based Plans		
Aklavik, Inuvik and Tuktoyaktuk community conservation plans (Aklavik HTC et al., 2016; Inuvik HTC et al., 2016; Tuktoyaktuk HTC et al., 2016)	The community conservation plans identify Special Designated Lands and their associated habitat values. The Yukon North Slope, including the coastal zone and marine areas, is identified as important for a wide range of wildlife habitat values.	2
Ivvavik and Herschel Island–Qikiqtaruk park management plans (Herschel Island–Qikiqtaruk Management Plan Review Committee, 2018; Parks Canada, 2018)	The two park management plans identify priorities for monitoring and protection of natural resources, including measures such as land zoning for protection of critical habitats.	1, 2
Species Conservation and Management		
Most of the featured species have management plans or guidelines in place that include populations with ranges including the Yukon North Slope. These plans are listed under Strategy B2.	Species management plans tend to focus on managing harvest. Some include recommendations or measures on habitat. For example, the grizzly bear management plan for the ISR (Nagy & Branigan, 1998b) includes maintaining current areas of grizzly bear habitats as one of its goals.	1, 2
Monitoring and Research Programs		
Many species plans, the community conservation plans, and both park management plans include objectives or priorities for monitoring. Plans and programs specific to research and monitoring relevant to habitat conservation include: a research plan for Yukon North Slope muskox (WMAC [NS], 2019); a monitoring plan for Tarium Niryutait Marine Protected Areas (DFO & FJMC, 2013), and the Herschel Island–Qikiqtaruk Inventory, Monitoring, and Research Program (Cooley, Eckert, & Gordon, 2012).	Monitoring and research plans (which may be built into other plans) identify knowledge gaps and guide priorities to improve information on habitats and understanding of relationships needed to identify and refine habitat conservation requirements. In addition, federal and territorial government agencies provide ongoing research and monitoring for a range of terrestrial and aquatic species.	1, 2, 3
Inuvialuit Settlement Region Community Based Monitoring Program (CBMP)	The CBMP is administered by the Inuvialuit Joint Secretariat and acts as a hub for a suite of wildlife and place-based programming. CBMP includes a number of sub-programs, like the Harvest Study (which demonstrates areas of use that are linked to both species abundance & subsistence, information that can therefore be used to understand conservation requirements).	1, 3

Strategy B2. Wildlife Populations

Apply management measures to maintain long-term productivity of wildlife populations when a concern is identified about populations, harvest or stressors.

How this Strategy Contributes to the Plan Goal

Work through this strategy supports management measures to conserve wildlife diversity and productivity.

Background

Inuvialuit have been safeguarding wildlife populations across the Yukon North Slope through traditional stewardship practices for as long as they have been present in this landscape. In the current modern land claim setting, the governments of the Yukon and the Northwest Territories and the Government of Canada have authority to set regulations, depending on the type of wildlife and the area managed.

Wildlife management planning at the species level is often accomplished through working groups made up of representatives of involved jurisdictions.

The IFA sets out a wildlife management structure, including a special regime for the Yukon North Slope. The IFA defines the harvest rights that apply on the Yukon North Slope (Table 6). If there is a validated conservation concern for a wildlife population, a Total Allowable Harvest may be recommended by the WMAC (NS) to the appropriate government Minister. The Inuvialuit Game Council then works with the Hunters and Trappers Committees (HTCs) to allocate harvest quotas to the Inuvialuit communities.

Bylaws specific to harvest of species are developed by the HTCs. The bylaws may also be reflected in territorial or federal regulations which also set out where harvest by non-Inuvialuit is allowed, such as for fishing.

Table 6. Inuvialuit harvesting rights on the Yukon North Slope

Harvesting Rights	Ivvavik National Park and Herschel Island–Qikiqtaruk Territorial Park	Aullaviat/ Anguniarvik	Marine Areas
Exclusive right	Polar bear, caribou[2], muskox, grizzly bear, furbearers, other big and small game, and migratory birds	Polar bears and furbearers	—
Preferential right[1]	Fish	Muskox, grizzly bear, caribou[2], other big and small game, migratory birds, and fish	Fish and marine mammals

1 *The Inuvialuit subsistence need for food, clothing and other personal use must be met before others are given the right to harvest these animals. Beneficiaries of adjacent claim settlements may harvest, with Inuvialuit consent, on the same basis as the Inuvialuit. Source: Inuvialuit Final Agreement.*

2 *Porcupine Caribou harvest rights are specified in the Porcupine Caribou Management Agreement and given effect in the Porcupine Caribou Herd Canadian Range-wide Native User Agreement.*

Priorities

Maintain an adequate information base. This is essential for population management. Depending on the species or area, information may include: status and trends of population abundance; characteristics such as mortality and reproductive success; harvest rates; and information to assess risks from stressors such as parasites, disturbance, competition with invasive species, or habitat changes. Sources of information include: Inuvialuit traditional knowledge and observations; Western science and traditional knowledge-based studies; monitoring, including harvest and community-based monitoring; and other surveys.

Mobilize Inuvialuit knowledge of wildlife populations within communities and beyond to encourage stewardship and monitoring by Inuvialuit, which informs Inuvialuit and government decision-making.

Consider a range of management tools in addition to harvest management, including education and outreach, as well as measures to reduce stresses on wildlife populations. Minimize or mitigate potential negative effects of human–wildlife interactions, and manage disturbance from cruise ship tourism.

Establish indicators such as those that measure population, reproductive success, or habitat conditions to assess the need for management actions.

Consider the status of wildlife populations and threats to habitats over their full ranges, on and beyond the Yukon North Slope. For example, industrial activity affecting caribou calving grounds in Alaska needs to be considered in assessing how well the Porcupine caribou are doing and what management actions are needed across the herd's range.

Manage to conserve genetic diversity. For example, sea-run Dolly Varden stocks are genetically distinct, depending on which river they spawn in, but all spawning populations are mixed in the marine areas where they are harvested. Monitoring and harvest management take this diversity into account (DFO, FJMC, GRRB, & Parks Canada, 2019). Muskox, polar bear and peregrine falcon are also the focus of genetic research.

Harvest Management Plan for the Porcupine Caribou Herd in Canada

The Plan establishes indicators of the how well the herd is doing. Indicators include measures of habitat conditions and observations from people out on the land. The indicators are used to guide decisions on when management actions should be taken and how conservative these actions should be.

Management actions include recommending or limiting the number of caribou harvested and restricting harvest to bulls. The Plan also covers harvest reporting, education and communication, and limiting disturbance to caribou. *(PCMB, 2009)*

Outcomes

1) Information needs for managing wildlife populations are supported on an ongoing basis.
2) Management plans or guidelines are in place, implemented, and updated as needed for populations for which there are conservation concerns.
3) Wildlife management plans and measures for the Yukon North Slope consider the status of and risks to wildlife populations over their entire ranges, including beyond the Yukon North Slope.
4) Harvest management measures are in place where needed to conserve or grow populations and maintain opportunities for Inuvialuit use.
5) Genetically viable and resilient wildlife populations remain on the Yukon North Slope.

Links to Plans and Programs

Table 7 summarizes management arrangements for the wildlife species featured in this Plan. The plans, guidelines and agreements are linked to outcomes for this strategy. Some management plans are focused only on harvest regulation, while others include consideration of habitat and stressors on the populations. Some plans consider information needs. The implementation of these species-based management plans and programs are informed by ongoing data inputs, including the Inuvialuit Settlement Region Community Based Monitoring Plan and the Arctic Borderlands Ecological Knowledge Society. The geographic scope of wildlife planning is a mix of population-based and jurisdiction-based areas, frequently not covering the full range of the population.

Table 7. Strategy B2: Management arrangements for featured wildlife species

Unless otherwise noted, non-Inuvialuit harvest is not permitted.

Species	Management Plans, Guidelines and Agreements	Harvest Management Measures (2019) for the Yukon North Slope
Multiple	• Inuvialuit Harvest Study (1988–1996) • Community-Based Monitoring Program, including the updated Harvest Study (2016–present) • Arctic Borderlands Ecological Knowledge Society	• Collect information relating to the harvest of species and conditions on the land during harvest activities. The results of these programs have been used in adaptive harvest management for Yukon North Slope species.
Caribou	• Harvest Management Plan for Porcupine Caribou Herd in Canada and implementation plan (PCMB, 2010, 2016) • International Porcupine Caribou Agreement (Government of Canada & Government of the United States, 1987) • Porcupine Caribou Management Agreement (Government of Canada et al., 1985)	• Voluntary reductions or limits to Porcupine caribou harvest in Canada are set through the Porcupine Caribou Management Board, guided by population indicators. • Non-Inuvialuit resident harvest may be permitted with licence for Aullaviat/ Anguniarvik.

Table 7. Continued

Species	Management Plans, Guidelines and Agreements	Harvest Management Measures (2019) for the Yukon North Slope
Moose	• Science-based Guidelines for Management of Moose in Yukon (Yukon Environment, 2016)	• No restrictions on Inuvialuit harvest. • Non-Inuvialuit resident harvest may be permitted with licence for Aullaviat/ Anguniarvik.
Grizzly bear	• Plan for ISR (Nagy & Branigan, 1998a) • Yukon plan (Yukon Environment, 2018)	• Harvest limited by an annual quota for the Yukon North Slope harvest area, based on bear abundance and density estimates. • Non-Inuvialuit resident harvest may be permitted with quota allocation.
Polar bear	• Inuvialuit–Inupiat Polar Bear Management Agreement in the Southern Beaufort Sea (Inuvialuit Game Council & North Slope Borough Fish and Game Management Committee, 2000) • Inuvialuit Settlement Region Polar Bear Joint Management Plan (Joint Secretariat, 2017) and implementation agreement (NWT Conference of Management Authorities, 2018) • International Agreement, circumpolar in scope (1973 Agreement on the Conservation of Polar Bears) • SARA management plan for Canada under development and complete for the ISR	• Harvest regulated by annual quotas allocated to Inuvialuit communities. The Southern Beaufort Subpopulation harvest is jointly managed with the Inupiat in Alaska.
Whales and seals	• Management Plan for the Bering–Chukchi-Beaufort Population of Bowhead Whale in Canada (DFO, 2014a) • Beaufort Sea Beluga Management Plan for the ISR (FJMC, 2013)	• Bowhead whale harvest in Canada is determined through co-management and licensed through DFO (*Fisheries Act*); Last harvest on Yukon North Slope in 1996. • No restrictions on Inuvialuit harvest for beluga and seals.
Dolly Varden	• Integrated Fisheries Management Plan for Dolly Varden of the Gwich'in Settlement Area and Inuvialuit Settlement Region Northwest Territories and Yukon North Slope 2019–2023 (DFO et al., 2019)	• No limits on Inuvialuit fishing on Yukon North Slope; fishing regulations for Ivvavik National Park set daily limits and closed areas for non-Inuvialuit fishers; Yukon sport fishing limits and regulations apply throughout the rest of the Yukon North Slope. • Big Fish River and all of its tributaries are closed to all fishing under the *NWT Fishery Regulations*, although a small subsistence harvest has occurred through a DFO Variation Order to allow fishing at the mouth of the Big Fish River (since 2012) and fish hole area (2014–16, 2018–19).

Table 7. Continued

Species	Management Plans, Guidelines and Agreements	Harvest Management Measures (2019) for the Yukon North Slope
Broad whitefish	• None	• No restrictions on Inuvialuit harvest.
Geese	• Migratory Birds Convention Act and regulations (Canada, 2017; CWS Waterfowl Committee, 2014) • Population management plans: Pacific Flyway Management Plan for the Western Arctic Population of Lesser Snow Geese (Pacific Flyway Council, 2013); Management Plan for Midcontinent Greater White-Fronted Geese (Flyway Councils, 2015); Management Plan: Pacific Population of Brant (Pacific Flyway Council, 2018) • Western Hemispheric Shorebird Reserve Network, North American Waterfowl Management Plan, Arctic Goose Joint Venture, Sea Duck Joint Venture	• No restrictions on Inuvialuit harvest.
Furbearers	• Wolf: Yukon Wolf Conservation and Management Plan (Government of Yukon, 2012)	• No restrictions on Inuvialuit harvest.
Dall's sheep	• Management Plan for Dall's Sheep in the Northern Richardson Mountains: Recommended Draft Plan (Working Group for Northern Richardson Mountains Dall's Sheep, 2008) • Science-based management guidelines for Yukon (under development)	• No restrictions on Inuvialuit harvest. • Non-Inuvialuit resident harvest permits may be issued for Aullaviat/Anguniarvik (Richardson Mountains).
Muskox	• Framework for the Management of Yukon North Slope Muskox (WMAC (NS), 2017)	• No restrictions on Inuvialuit harvest.

Strategy B3. Climate Change Effects

Monitor effects of climate change on Yukon North Slope ecosystems. Promote and engage in studies that contribute to understanding and forecasting the effects of climate change on wildlife and habitat. On an ongoing basis, assess options and implement measures for mitigation and adaptation to address climate change effects in the management of wildlife and wildlife habitats.

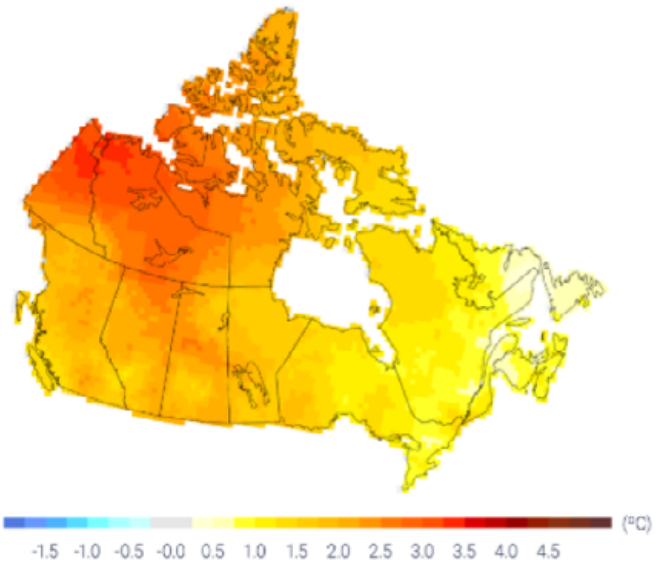
How this Strategy Contributes to the Plan Goal

Work under this strategy will help to understand, forecast, and, where possible, mitigate effects of climate change on wildlife habitats and populations. This work underlies work on other strategies and is essential for adaptive and precautionary management.

Background

Habitats for wildlife change in their suitability and use over time due to natural processes such as erosion, slumping, fire, vegetation succession, water availability, and even the presence of animals themselves. Because of climate change, many of these natural processes are happening faster, more frequently, or occurring over larger areas. Habitats are also changing in response to warmer average temperatures (Map 5) and shifts in seasons. These changes have been observed and documented by both Inuvialuit and scientists. Planning for wildlife conservation in the long term means taking these changes into account, even when it is not clear what the future will bring.

Map 5. Observed changes in annual temperature across Canada between 1948 and 2016, based on linear trends



In northwestern Canada, the greatest seasonal changes are increases in temperature in winter and spring. Environment and Climate Change Canada (Zhang et al., 2019, Figure 4.3).

Animals are also affected directly by impacts of climate change. For example, extreme weather events like deep snowfalls and icing are natural occurrences – but they are predicted to happen more frequently and to greater extremes with climate change. These events can prevent caribou, muskox, and other animals from accessing food. There are many less visible effects from climate change that can cause populations to drop in numbers, too. Examples are lowered rates of reproduction due to more parasites or biting insects, and competition for food with species that are extending their ranges. Even harder to detect are changes that happen to the smaller life forms like the insects and soil micro-organisms that are important for healthy, productive ecosystems. Range shifts in plants and wildlife, as well the potential for invasive species, parasites, and pathogens, must also be considered when addressing conservation requirements for the Yukon North Slope. The warming climate is already changing the suite of species found in the region.

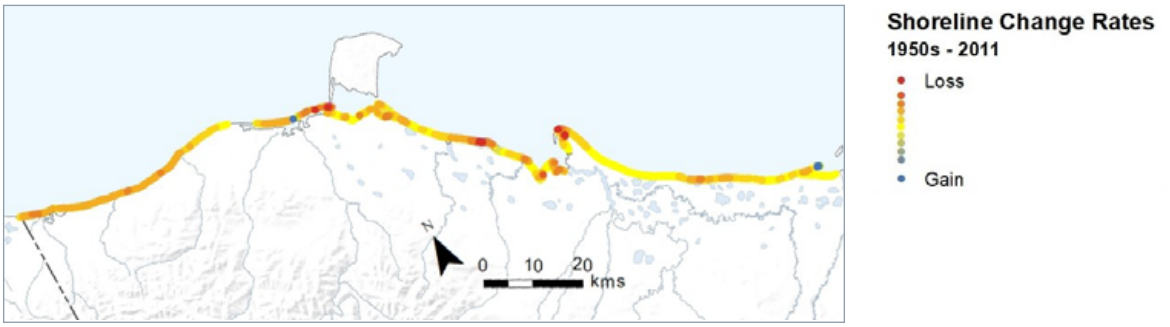
Although there is uncertainty about the effects of climate change on wildlife and ecosystems, a lot is known about changes in recent decades on the Yukon North Slope. Inuvialuit have shared and documented their observations of change at meetings, workshops, and through interviews and community-based monitoring. Research and monitoring have measured, among other effects, the shrinking of summer sea ice, thawing of permafrost, increases in slumping of land and riverbanks, accelerated shoreline erosion (Map 6), earlier green-up in the spring, the shrubification of the tundra, shifts in the density and distribution of beavers, and the increase in density of moose that has accompanied the spread of shrubs. Evidence from many sources shows that ecosystem changes are happening rapidly in this part of the world and that these trends are likely to continue. Research on Arctic ecosystems has predicted changes to come; this work is illustrated in a model-based analysis of how climate change may be altering Yukon North Slope ecosystems over the long term (Map 7).

Findings from 18 years of vegetation research on Qikiqtaruk–Herschel Island:

- Plants are starting their spring growth on average nine days earlier per decade.
- Plants are getting taller. The average plant canopy height is doubling per decade.
- Shrubs and grasses are doubling in abundance per decade.

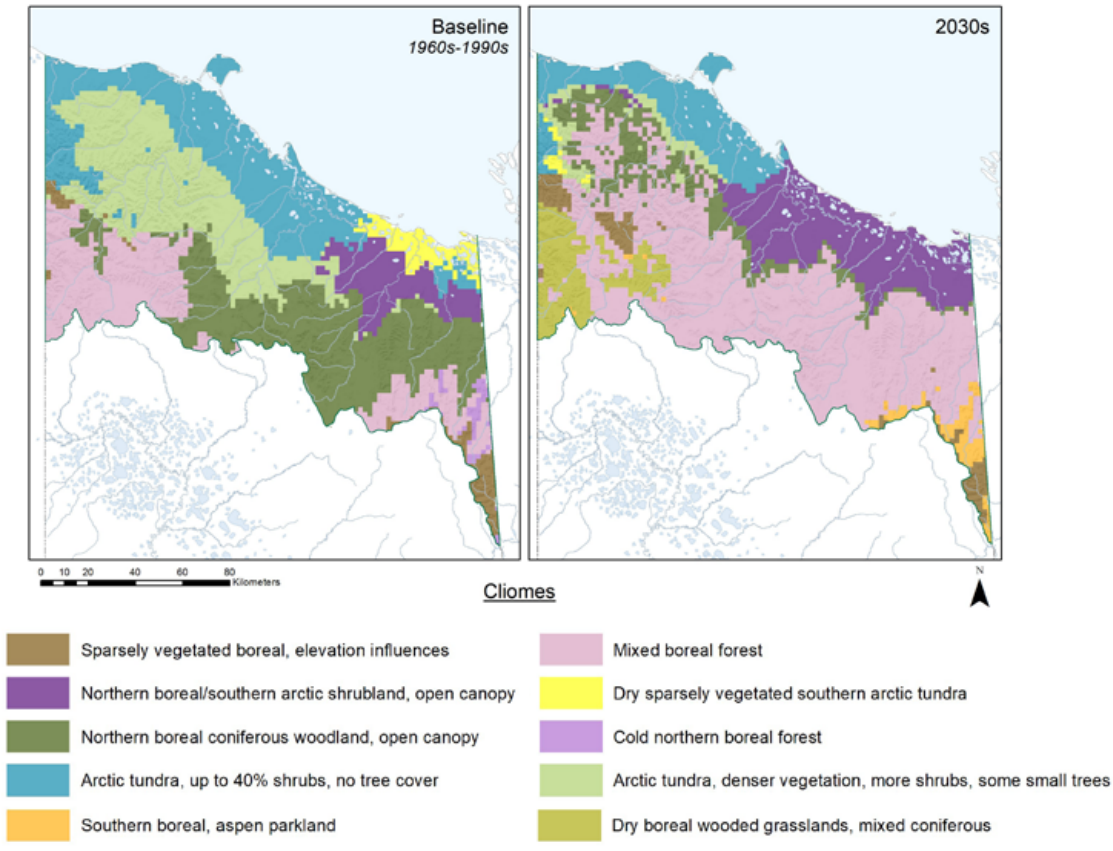
(Myers-Smith et al., 2019)

Map 6. Shoreline change from 1950s to 2011



This map shows the average annual rate of change over different parts of the shoreline. In almost all areas, the shoreline is retreating. Red areas have the highest rates of shoreline retreat, between 1 and 7 meters per year (a total of 50 to 350 meters of shoreline retreat over 50 years). The yellow and white areas have not changed much over this period. (Irrgang et al., 2018, Figure 3)

Map 7. Yukon North Slope cliomes: baseline picture and a scenario-based prediction for the 2030s



The term "cliome" is a portmanteau of "climate" and "biome". The classification of cliomes is based on climate parameters and the vegetation communities that are currently associated with them. The predicted shifts in cliomes reflect predicted changes in climate, based on a scenario in which greenhouse gas emissions continue along the pathway of current trends. Of course, vegetation does not immediately change to match new climate conditions – there is a time lag – and other factors, such as soil types, also determine where vegetation will grow. However, this does give a broad picture of the extent of ecosystem changes that may be occurring now and over the next two decades. Scenario modelling: Scenarios Network for Arctic Planning, University of Alaska Fairbanks (SNAP, 2012).

Priorities

Monitor climate change and its effects and improve understanding of linkages between changes in climate and effects on ecosystems and wildlife, and on the interactions between climate change and other stressors, such as contaminants, through collection of scientific data and Inuvialuit traditional knowledge.

Adjust actions, where possible, to adapt to effects of climate change on wildlife and wildlife habitat.

- There are limited direct actions that can be taken to hold off or reverse effects – possibly measures to limit the spread of invasive species that take hold because of warmer temperatures, or to limit the spread of wildlife diseases.
- Awareness of how the effects of climate change make wildlife populations more vulnerable calls for new and innovative approaches to population management. The aim is to ensure that populations are sufficiently abundant and diverse to recover from these new pressures.
- Understanding which ecosystem types are most sensitive (such as riverbanks and wetlands) and which areas may increase in importance as climate change progresses (such as denning sites on land for polar bears, or areas that remain suitable for tundra vegetation as it shrinks in geographic extent) allows planning of extra measures to conserve these ecosystems. Because the ecosystem changes that result from climate change have large and uncertain effects on wildlife habitat, it is important to plan for flexibility. Boundaries of conservation areas will need to shift with these changes in ecosystems and wildlife habitats.

Take steps to reduce greenhouse gas emissions. Although emissions at a global scale drive climate change, all reductions in emissions contribute to addressing the source of this problem.

- Where possible, minimize greenhouse gas emissions on the Yukon North Slope, such as emissions from parks operations, research and monitoring programs, potential marine industrial development, and commercial enterprises such as tourism. Measures to manage these emissions could include reviews of existing operations, consideration of greenhouse gas emissions in environmental assessment and permitting, and education and outreach initiatives.
- Limit land use alterations that result in the greenhouse gas emission or reduce the capacity of the Yukon North Slope environment to absorb carbon.
- Engage with regional, national and international organizations to press for reduction of greenhouse emissions elsewhere in the world. The body of high-profile international research that demonstrates current large-scale effects of climate change on the Yukon North Slope, combined with the threat to Arctic wildlife and Inuvialuit cultural values posed by climate change, provides a strong basis for influencing policies and practices on greenhouse gas emission levels.

Outcomes

1) Monitoring and research, including Western science and Inuvialuit knowledge, that build knowledge about the effects of climate change on Yukon North Slope environments, ecosystems, wildlife and wildlife habitats are ongoing and meet identified conservation and management needs.

2) Wildlife conservation and management plans, programs and measures are adapted where possible to account for current and projected effects of climate change. This includes measures for conservation of important habitats that include provisions for adaptation to changing conditions, and measures to enhance the resilience of populations.

3) Measures to manage and, where possible, minimize emissions of greenhouse gases are incorporated into ongoing and planned Yukon North Slope activities and into assessment of development proposals. Examples include proposals for offshore oil and gas exploration and development, and those that may damage permafrost and wetland systems.

4) Efforts are underway to inform broader policies and practices for greenhouse gas emission reductions beyond the Yukon North Slope through engagement at regional, national and international scales.

Links to Plans and Programs

Climate change is increasingly being incorporated into planning (Table 8). The challenge is to move beyond recognition that effects may be significant for wildlife and develop response strategies and measures.

Table 8. Strategy B3: Plans and programs linked to addressing climate change effects on wildlife conservation

Plan or Program	Role in Addressing Climate Change Effects on Wildlife	Link to Outcomes
Place-Based Plans		
Our Clean Future: A Yukon strategy for climate change, energy and a green economy (Government of Yukon, 2020)	Provides territory-wide policy guidance on reducing emissions, renewable energy, climate change adaptations, and a green economy.	**3, 4**
Ivvavik National Park of Canada Management Plan (Parks Canada, 2018)	Recognizes the significant changes to the natural systems within the Park. Acknowledges the Park's role in establishing benchmarks for measuring changes in ecosystem integrity and communicating those changes locally and nationally.	**1, 2, 3, 4**
Herschel Island–Qikiqtaruk Territorial Park Management Plan (Herschel Island–Qikiqtaruk Management Plan Review Committee, 2018)	Recognizes the significant climate change-induced stressors and changes to natural systems, including wildlife population shifts, occurring in and around the Park. Maintains long-term monitoring datasets that track change across decades and systems (species and ecological integrity), particularly through the Herschel Island–Qikiqtaruk Inventory, Monitoring and Research Program.	**1, 2**

Table 8. Continued

Plan or Program	Role in Addressing Climate Change Effects on Wildlife	Link to Outcomes
Place-Based Plans		
Integrated Ocean Management Plan for the Beaufort Sea: 2009 and Beyond (Beaufort Sea Partnership, 2009)	Recognizes the impact of climate change on the region, including impacts to wildlife and traditional use, and speaks to assessing and developing an adaptive management response to climate change.	1, 2
Tarium Niryutait Marine Protected Areas Monitoring Plan (DFO & FJMC, 2013)	Establishes climate change-related indicators for monitoring within the marine protected area.	1, 2
Species-Based Plans		
Various – see strategies B1 and B2	All species-based plans have a role in climate change effects (monitoring, studying, mitigating/adapting). Recent plans speak specifically to climate change.	1, 2
Inuvialuit Settlement Region Polar Bear Joint Management Plan (Joint Secretariat, 2017)	Consideration of effects of climate change is incorporated throughout. The Plan states that "actions will be taken to ensure that the impact of climate change on polar bears is highlighted through the appropriate regional, national and international fora." (p. 1)	1, 2, 4
Monitoring and Research Programs		
Government of Yukon, Government of Canada, and universities, and non-government-led climate, ecological, and wildlife research and monitoring programs	The two park plans listed above include monitoring programs that are related to climate change effects. In addition, ongoing monitoring and research projects track changes and examine underlying ecological relationships on the Yukon North Slope. Ongoing work includes climate and hydrology monitoring and studies on ocean and sea-ice conditions, snowpack, permafrost, erosion and slumping, vegetation, and habitats and population characteristics of wildlife species. All these current programs aid in tracking change.	1

Conservation Requirements for Featured Wildlife Species

Conservation requirements at the species level are consolidated in Table 9. See the species accounts in Appendix 1 and the companion report for further details and supporting evidence. These conservation requirements are grounded in the best available Western science and Inuvialuit knowledge of each species, documented in over a decade's worth of WMAC (NS) and collaborator studies. The conservation requirements for each of these species or group of species incorporate aspects of conservation of wildlife habitat (Strategy B1), wildlife population quality and abundance (Strategy B2), and consideration of the effects of climate change (Strategy B3).

Table 9. Conservation requirements identified for featured species

From Appendix 1. Featured Wildlife Species

Featured Species	Conservation Requirements
Tuttu/Caribou (Porcupine Caribou Herd)	1. Protection of the entire caribou calving and post-calving grounds and summer habitat on the Yukon North Slope. 2. Protection of core summer habitats and migratory routes frequently used by the herd and conservation of those which are currently used less frequently but may become important in the future. 3. Conservation of caribou habitats across the Porcupine Caribou Herd's range, especially of calving grounds in the Arctic National Wildlife Refuge, through collaboration among jurisdictions and parties, and by actively supporting research, monitoring, management and mitigation of development impacts to meet the ecological requirements of the herd. 4. Research and monitoring of habitat condition and quality with an emphasis on the calving and mid- to late-summer periods.
Tuttuvak/Moose	1. Conservation of coastal wetlands, river valleys, riparian areas, and areas with high winter use. 2. Ongoing monitoring of moose density and distribution and habitat in relation to climate change. 3. Identification of specific migration corridors and protection of these corridors to ensure moose can meet annual needs.
Akłaq/Grizzly bear	1. Conservation of multiple ecosystem types grizzly bears depend on, with unimpeded passage for bears throughout the Yukon North Slope. 2. Identification and protection of denning sites from disturbance. Where ongoing or proposed activities are in areas with dens or denning habitat, den sites should be identified and activities relocated away from these sites, particularly through winter until early June. 3. Non-harvest mortality kept to a minimum.
Nanuq/Polar bear	1. Protection of denning areas, and summer refugia if or when they are identified. 2. Conservation of nearshore habitats critical to polar bears. 3. Cooperative, adaptive management of the Southern Beaufort Sea polar bear subpopulation across jurisdictions.

Table 9. Continued

From Appendix 1. Featured Wildlife Species

Featured Species	Conservation Requirements
Whales and Seals	1. Minimize harmful effects of any industrial and shipping activity on whales and seals. 2. Consideration of effects of climate change in whale and seal population management and habitat conservation decisions.
Iqaluqpik/Dolly Varden	1. Minimize disturbance to spring-fed spawning and overwintering sites and ensure access to these spots by Dolly Varden is not impaired by human activity. 2. Conservation of productive summer feeding conditions along the coast. 3. Track hydrological and fish passage changes to key spawning and overwintering rivers associated with new or increased beaver infrastructure. Rivers on the Yukon North Slope are likely to become more favourable for beaver habitat over time, with increased shrubification.
Aanahqlik/Broad Whitefish	1. Conservation of the nearshore band of brackish water along the Yukon North Slope coastline and in bays with a freshwater surface layer. 2. Conservation of lakes and creeks along the coastal plain.
Geese	1. Conservation of large areas across the Yukon North Slope coast, especially tidal flats and deltas, to allow for variability in habitat use and space for habitat recovery. 2. Management and monitoring of overabundant species to ensure long-term habitat health for geese and other species. 3. Protection from significant impacts to geese from marine industrial development and associated infrastructure, and from increased ship traffic and aerial disturbance.
Furbearers	1. Conservation of large tracts of diverse ecosystem types with ample prey. 2. Protection of denning areas for wolves. 3. Research and monitoring of distribution and seasonal movements of furbearers in relation to changing climate and changing ecosystems.
Imnaiq/Dall's Sheep	1. Conservation of key habitat types and locations used by Dall's sheep, including mineral licks, lambing cliffs, and winter ranges. 2. Management of disturbance so that human activities do not reduce the ability of the range to support sheep, while recognizing harvest rights and ecotourism potential. 3. Monitoring of sheep populations and habitat use so that management measures that protect important sheep areas and habitat types can be adapted to the effects of climate change.
Umingmak/Muskox	1. Conservation of a diverse landscape of lowlands and hills with moist vegetation, from sedge swamps to windblown ridges. 2. Investigation of potential interactions in seasonal habitat use by muskox and caribou to evaluate effects of the reintroduced muskox population on caribou. 3. Research and monitoring to help understand the status and vulnerability of this small muskox population.

Objective C. Inuvialuit Traditional Use

Maintain and enhance Inuvialuit traditional use in the context of changing socio-cultural, economic and environmental conditions. This can be achieved through conservation of wildlife, traditional use areas and access routes, and other management measures.

Central to the goal of this plan is the sustainability of Inuvialuit traditional use on the Yukon North Slope. The conservation of wildlife and habitat and the requirements set out in Objective B – Wildlife are directly linked to Objective C.

The IFA provides a legal framework that protects Inuvialuit traditional use through the establishment of certain exclusive and preferential harvesting rights on the North Slope and the right to participate in management decisions that affect those rights. Some of these protections are addressed in Objective D – Environmental Protection. In short, the conservation of Inuvialuit traditional use is not only goal-based, it is also rights-based through the IFA.

The sustainability of Inuvialuit traditional use on the Yukon North Slope is also tied to the maintenance of Inuvialuit traditional knowledge of harvest areas and travel routes, equipment and practices, codes of harvest conduct, and environmental conditions. Conversely, the acquisition and transfer of Inuvialuit traditional knowledge is intrinsic to being on the land and water and knowing the land through first-hand experience and observation. Inuvialuit traditional use contributes directly to the conservation of wildlife and habitat and the strength of that contribution is to a certain extent a function of the number of Inuvialuit who are active on the land and knowledgeable about it.

Today, there are a number of barriers to Inuvialuit traditional land use on the Yukon North Slope. The cost of travel and equipment is high, and in recent decades individual wages and household incomes have not kept pace with the rising price of gas, boats and motors, snow machines, all-terrain vehicles, and gear. These costs have proven to be a significant barrier to the participation of Inuvialuit households in traditional activities, threatening food security and impacting the transfer of traditional knowledge and land-based skills to young people. Other factors, like participation in the wage-economy and an evolving socio-cultural reality, also contribute to how Inuvialuit are or are not able to use the Yukon North Slope.

Climate change has altered long-predictable weather patterns, the timing of wildlife migrations, and historical distributions of wildlife populations. These changes have introduced uncertainty into longstanding knowledge and calculations of when and where to travel to harvest plants and wildlife. The landscape itself has also transformed over the years as a result of climate change, increasing travel costs (both time and financial) and risks.

Importantly, Inuvialuit traditional use is more than a set of discrete ad hoc activities – be they hunting, trapping, fishing, camping or gathering. Inuvialuit traditional use today remains a way of life with social, economic and cultural values that tie families to one another through the shared production, processing, distribution and consumption of their harvest and time spent together on the land.

Traditional use is at the heart of what binds a community together and, in this respect, contributes to the very sustainability of Inuvialuit communities. The Yukon North Slope is simultaneously a “breadbasket”, a seasonal home, and a source of cultural resilience, particularly for Inuvialuit in Aklavik and at their summer camps at Shingle Point and other places along the coast. It is for these and other reasons that the Yukon North Slope is given special recognition and standing in the IFA.

Strategy C1.
Inuvialuit Traditional Use

Apply management measures to maintain and enhance Inuvialuit traditional use in support of household food security, community health and well-being, and the mobilization of traditional knowledge and skills.

How this Strategy Contributes to the Plan Goal

Initiatives under this strategy contribute directly to the conservation of Inuvialuit traditional use and culture and the maintenance of Inuvialuit knowledge and its application to the conservation of wildlife and habitat.

Background

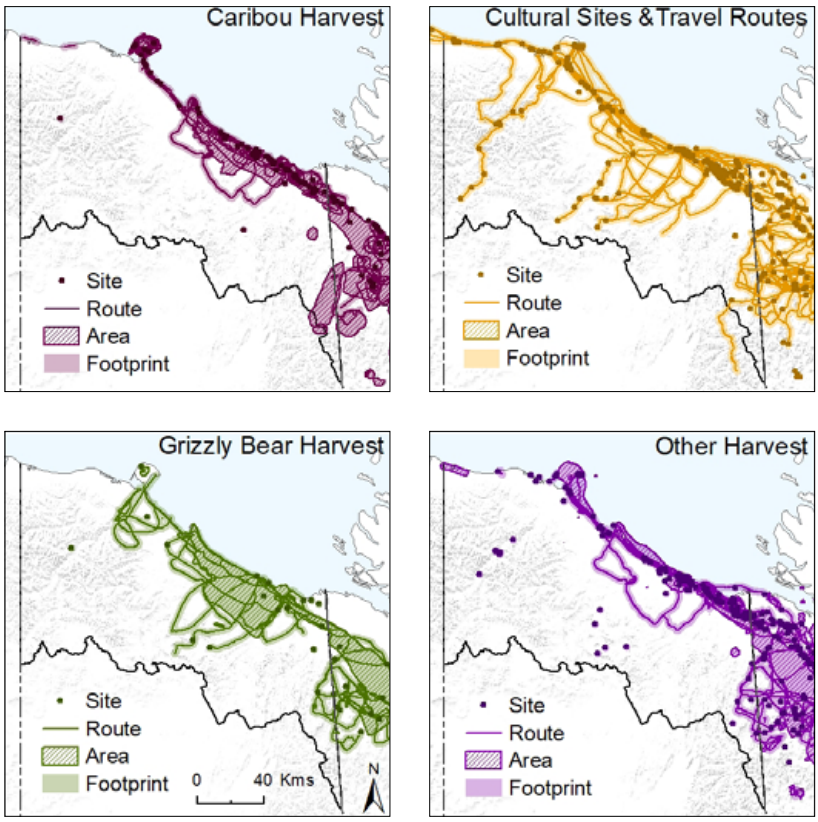
The history of Inuvialuit traditional use of the Yukon North Slope is long and complex. Inuvialuit have lived on and used the Yukon North Slope for many generations, harvesting, raising families and travelling, all of which are reflected in a network of travel routes, hunting camps and other cultural sites across the landscape. The relationship between Inuvialuit and the Yukon North Slope continues to be incredibly important. Inuvialuit traditional use of the Yukon North Slope from the 1900s forward is well documented. The earliest mapping was conducted in the mid-1970s as part of the Inuit Land Use and Occupancy Project (Freeman, 1976). This work formed a basis for the assertion of Inuvialuit rights on the Yukon North Slope and informed the recognition of those rights in the IFA and the establishment of the special conservation regime for the area to protect those rights.

The Inuvialuit Traditional Use Study (WMAC [NS] & Aklavik HTC, 2018b) documented and mapped over 2,000 features within the current living memory of Aklavik Inuvialuit, including travel routes, cabin sites, cultural sites and harvest locations for big game, small game, furbearers, fish, waterfowl and plants.

These features are illustrated in Map 8. A comparison of the Inuvialuit traditional use maps from the 1970s documenting traditional use from two periods – pre-1955, and 1955 to 1974 – with the 2015 maps indicates significant areas of overlap; however the total area of active use, particularly inland on the North Slope, has decreased (Map 9). A number of proximal factors account for the decline, including shifts in the distribution and availability of wildlife populations, the increasing cost of travel to reach more remote and less accessible areas, the time constraints of increasing participation in wage work, and a loss or decline in the traditional knowledge of conditions in these areas. Despite the decline in use, the Yukon North Slope continues to be a place of great importance to the Inuvialuit.

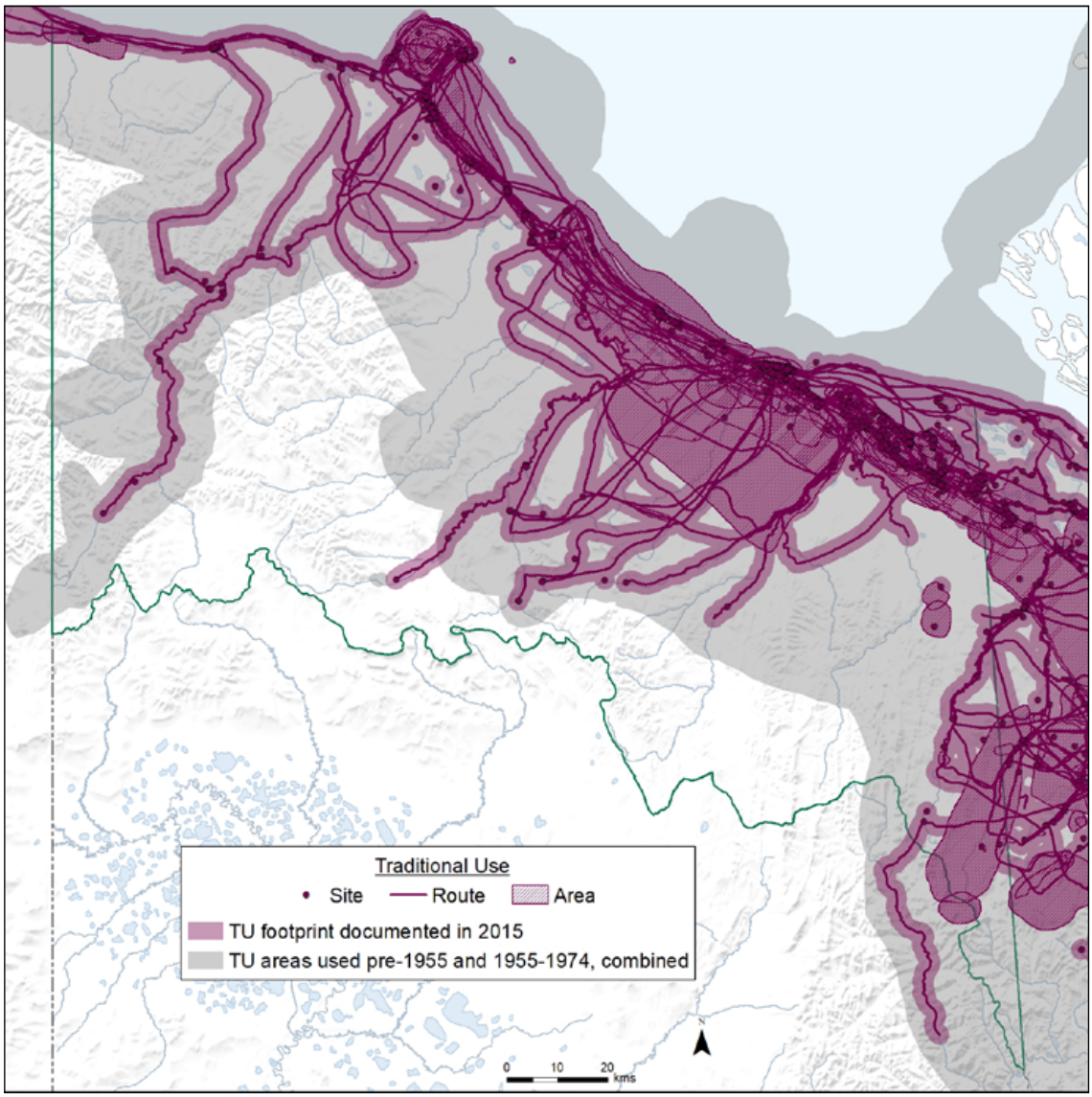
> Yukon North Slope is rich. Caribou, fish, the land is useful. You go there with boats and snow machines … I think I've considered it as a warehouse. When I go down, I open it up, freeze it there … When I'm coming back to Aklavik, I feel like I'm closing the gate. I've been there. I left the land in good condition. I've got some fish and I've got caribou for the winter. I'm going to be pretty well and good for the year.
>
> *Traditional Knowledge Assessment for Key Species of the Beaufort Sea (Brogan, 2019)*

Map 8. Inuvialuit traditional use: caribou, grizzly bear and other harvest, and cultural use and travel



Yukon North Slope Traditional Use Study (WMAC [NS] & Aklavik HTC, 2018b).

Map 9. Traditional use footprint, 2015 and area used pre-1955 and 1955 to 1974



2015 data and maps of older use areas are from Yukon North Slope Inuvialuit Traditional Use Study (WMAC [NS] & Aklavik HTC, 2018b); data for the older use areas are from the Inuit Land Use and Occupancy Project (Freeman, 1976).

The opportunity, capacity, and ability of Inuvialuit to shift harvest effort throughout the Yukon North Slope when needed are important for harvest strategies and stewardship. These strategies need to be flexible enough to adapt to changing socio-economic and environmental conditions that affect both Inuvialuit traditional use and wildlife. For this reason, areas of less active use today remain important. Historical use provides an indication of habitat areas that may be required in the future to meet household requirements for traditional country foods.

The Aklavik Inuvialuit wildlife harvest has been well documented since the mid-1980s. The reported harvest over this period and since attests to the continued high levels of household consumption of traditional food species. Inuvik and Tuktoyaktuk households also depend on Yukon North Slope wildlife to meet their food needs. The role of traditional foods in contributing to overall household food security remains financially significant and culturally preferable and is reinforced by the high cost and limited availability of nutritious, affordable, store-bought food. The ability of Inuvialuit to harvest wildlife, the state of ecosystems to provide it, and the sufficiency of financial and other means of accessing it are important elements of Inuvialuit food security and the foundation of Inuvialuit traditional use on the Yukon North Slope.

Funds such as the Inuvialuit Harvesters Assistance Trust Fund and the programs that it supports provide financial assistance to Inuvialuit harvester households to facilitate participation in harvesting activities, supplement household incomes, increase Inuvialuit economic self-reliance, and encourage the re-establishment of traditional skills among Inuvialuit youth.

Priorities

Invest in Inuvialuit traditional use through initiatives and sources of sustainable funding that contribute to increasing the participation of Inuvialuit households in land-based activities. This priority can be accomplished in part by supporting improved access to harvest areas, and through measures that optimize the harvest of wildlife, plants, and medicines for household food security and well-being. These initiatives include the establishment of permanent funds or trusts where feasible, enhancements to existing programs, such as the ISR Harvesters Assistance Program and the Community-Based Monitoring Program, skills development, and improving infrastructure through cabin construction and maintenance, equipment purchases, and securing drinking water sources on the land.

Food insecurity in the ISR

Food insecurity occurs when one or more household members do not have access to an acceptable amount of quality, healthy food, usually because of financial constraints. Data from the 2012 Aboriginal Peoples Survey indicate that 33% of Inuvialuit adults (aged 25 years and older) lived in a household in the Inuvialuit Settlement Region that experienced food insecurity. (Arriagada, 2017)

Enhance the link between Inuvialuit traditional use of the Yukon North Slope and maintaining, transferring and mobilizing Inuvialuit knowledge. Leveraging existing programs, such as the Inuvialuit Settlement Region Community-Based Monitoring Program, in tandem with exploring novel ways to mobilize knowledge, such as community-driven research priorities and programs, will provide a range of tools to implement this priority.

Strengthen Inuvialuit cultural attachments, especially those of young people, to the area through on-the-land cultural programming, such as Elder host camps and Indigenous cultural exchanges.

Outcomes

1) Inuvialuit access to traditional use areas on the Yukon North Slope has improved and areas of historical use are documented and conserved.
2) The contribution of traditional wild foods to Inuvialuit household food security has increased and is sufficient to meet community needs, as determined by Inuvialuit.
3) Inuvialuit traditional use is increasingly recognized and valued as a means for expanding the Yukon North Slope knowledge base and monitoring changing conditions, including the impacts of climate change.
4) Inuvialuit participation, especially that of young people, in traditional use activities has increased.

Links to Studies and Programs

Studies and programs contributing to the conservation of Inuvialuit traditional use and traditional knowledge on the Yukon North Slope are summarized in Table 10.

Table 10. Strategy C1: Studies and programs linked to Inuvialuit traditional use and knowledge

Study or Program	Role in Supporting Inuvialuit Traditional Use and Knowledge	Link to Outcomes
Yukon North Slope and related ISR traditional knowledge studies: • *Traditional Knowledge Assessment for Key Species of the Beaufort Sea (*Brogan, 2019) • *Inuvialuit Traditional Ecological Knowledge of Beluga Whale (Delphinapterus leucas) Under Changing Climatic Conditions in Tuktoyaktuk, NT* (Waugh et al., 2018) • *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope* (WMAC [NS] & Aklavik HTC, 2018a) • *Aklavik Traditional Use and Traditional Knowledge Annotated Bibliography* (Armitage, 2015) • *Conduct of Traditional Knowledge Research—A Reference Guide* (Armitage & Kilburn, 2015) • *Inuvialuit and Nanuq: A Polar Bear Traditional Knowledge Study* (Joint Secretariat, 2015) • *Local Ecological Knowledge of Staging Areas for Geese in the Western Arctic* (Bartzen, 2014) • *Aklavik Local and Traditional Knowledge about Porcupine Caribou* (WMAC [NS] & Aklavik HTC, 2009) • *Aklavik Local and Traditional Knowledge Study about Grizzly Bears of the Yukon North Slope* (WMAC [NS] & Aklavik HTC, 2008) • *Aklavik Inuvialuit Describe the Status of Certain Birds and Animals on the Yukon North Slope* (WMAC [NS] & Aklavik HTC, 2003) • *Inuvialuit Traditional Ecological Knowledge of Fisheries in Rivers West of the Mackenzie River* (Papik, Marschke, & Ayles, 2003)	Yukon North Slope-related traditional knowledge studies support the conservation of Inuvialuit traditional use by providing important information on changing environmental and population conditions that affect that use.	1, 3

Table 10. Continued

Study or Program	Role in Supporting Inuvialuit Traditional Use and Knowledge	Link to Outcomes
Yukon North Slope Traditional Use Studies: • *Yukon North Slope Inuvialuit Traditional Use Study* (WMAC [NS] & Aklavik HTC, 2018b) • "Inuit Land Use in the Western Canadian Arctic" (in Freeman, 1976)	Traditional use studies document the spatial requirements of Inuvialuit traditional use on the Yukon North Slope currently and in the past. This assists in planning for future use in the context of changing socio-economic, cultural and environmental conditions.	1, 2
Harvest Studies: • Inuvialuit Harvest Study: Data and Methods Report 1988–1997 (Inuvialuit Harvest Study, 2003) • Porcupine Caribou Harvest Data Program • ISR Community-based Monitoring Program	Studies reporting and documenting Inuvialuit harvest provide data for optimizing sustainable harvest levels, determining wildlife and harvester compensation, and assessing the condition of harvested wildlife species.	1, 2
Food security: • Inuvialuit Harvesters Assistance Program (IRC, 2019b) • Inuvialuit Settlement Region Community-Based Monitoring Program – Inuvialuit Harvest Study (IRC, 2019a) • *Supporting Inuit food security: A synthesis of initiatives in the Inuvialuit Settlement Region, Northwest Territories* (Kenny, Wesche, Fillion, MacLean, & Chan, 2018) • Community Harvesters Assistance Program (Government of the Northwest Territories, n.d.)	Financial support programs directly contribute to Inuvialuit participation in land-based activities, the maintenance of traditional knowledge and the transfer of traditional skills to young people.	1, 2, 3, 4

Strategy C2. Climate Change and Traditional Use

Employ monitoring and directed research to track and understand current and future effects of climate change on Inuvialuit traditional use of the Yukon North Slope. On an ongoing basis, assess options and implement measures for mitigation and adaptation, to enhance the resilience of traditional use to climate change.

How this Strategy Contributes to the Plan Goal

Work under this strategy will help to understand, forecast, and, where possible, mitigate effects of climate change on traditional use.

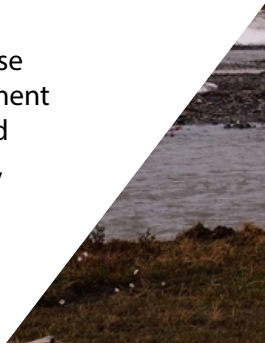
Background

The effects of climate change on wildlife, habitat, and geophysical and weather conditions as described in Strategy B3 have carry-through effects on traditional use. Inuvialuit have experienced and adapted to climatic and ecological change in the past, over many hundreds of years. However, the change that is now occurring is at a pace and scale that will test the limits of adaptability.

The environment influences every aspect of Inuvialuit life. The impacts of climate change affect traditional use as a foundation of Inuvialuit culture and knowledge. Traditional harvest practices and patterns are greatly affected by changes in animal migration patterns, as well as the timing, distribution and availability of wildlife. Extreme weather, unpredictable river flows and ice breakup, strong winds, and altered sea-ice conditions affect travel routes, wayfinding and safety. In response, the cost of travel has increased. More fuel and supplies are required for longer distances, and larger and faster boats are needed for narrower windows of safe travel time. Warmer temperatures have lowered the quality of some wildlife harvested for food or for sale. For example, the flesh of some types of fish has become softer, and some furbearers have shorter and thinner hair. These changes have led to shifts in which species are preferred for harvest and changes in the mix of traditional and store-bought foods in people's diets. Lower water levels and increased siltation have reduced access to clean drinking water sources, affecting camp life at traditional gathering places such as Shingle Point. Important cultural sites and camps have been altered by tidal surges and increasing thawing of permafrost and associated slumping and erosion (see Strategy B3 on climate change and Map 6 showing the extent of coastal erosion). Coastal burial sites and cabins are being lost. Spits and lagoons are disappearing as safe havens for travel. With a changing climate also comes an increased risk of invasive species, parasites, and pathogens that have the potential to shape Inuvialuit harvesting and livelihoods, on top of the many other shifts already experienced.

Significant changes have been recorded in Inuvialuit traditional knowledge reports since the 1980s. The pace and scale of change has increasingly tested Inuvialuit confidence in long-established predictions and judgments – derived from generations of traditional knowledge holders – about animal behaviour and availability, safe weather and ice conditions, and other seasonal markers.

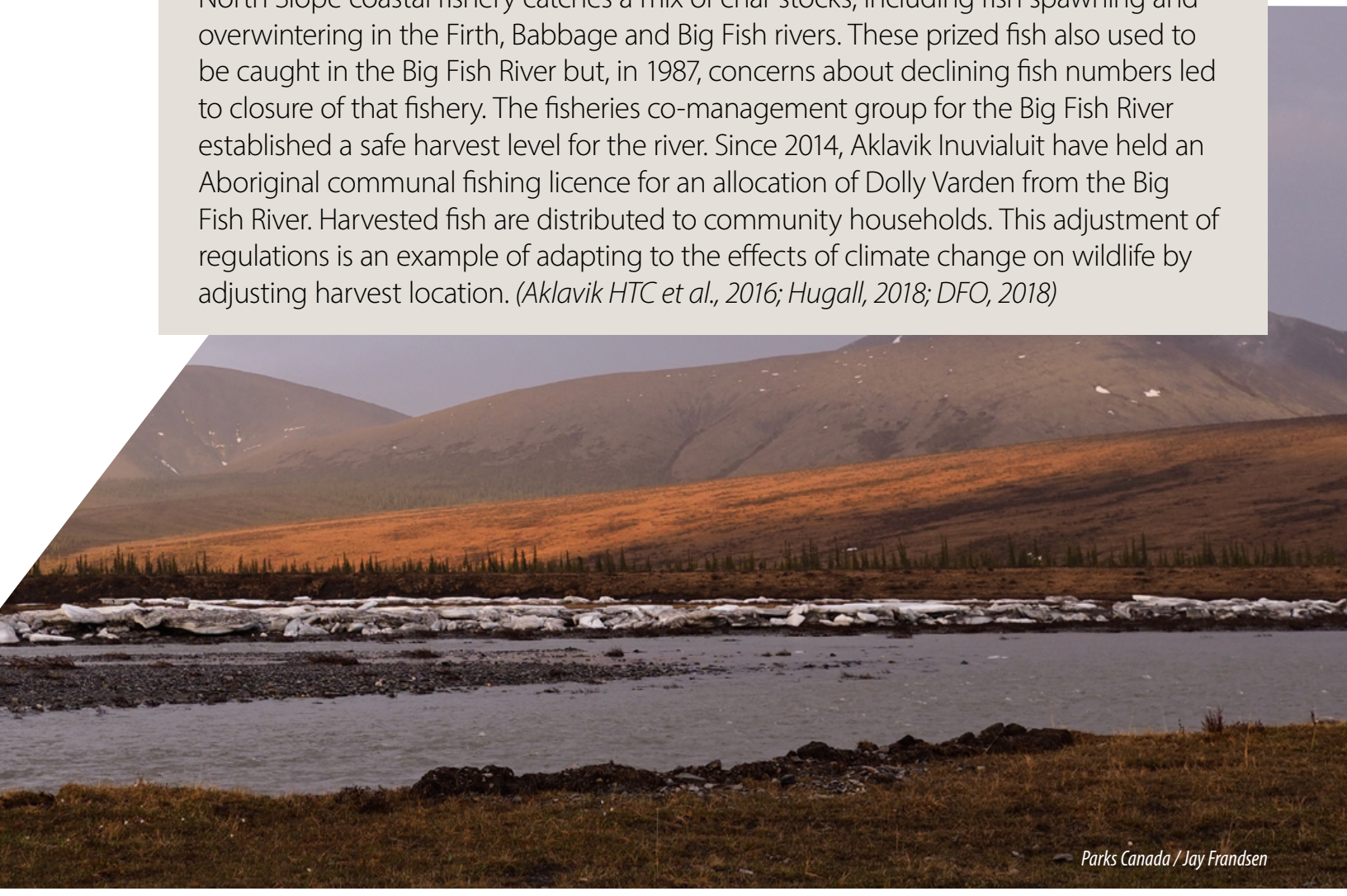
The effects of climate change on traditional use have significant implications for the management of wildlife harvests. New approaches will need to increase planning and regulatory flexibility,



place a heavier reliance on risk assessment, and have greater tolerance and care in the application of management approaches. Wildlife management will need to meet increased demands for research on population and stock assessment and the determination of sustainable harvest levels. Harvest management will need to rely more on Inuvialuit harvesters, local communities and regional institutions to monitor and report ecological and sociological changes resulting from altered conditions. There are also significant financial costs involved in implementing climate change mitigations that protect traditional use on the Yukon North Slope.

Adapting Dolly Varden harvest to changing conditions

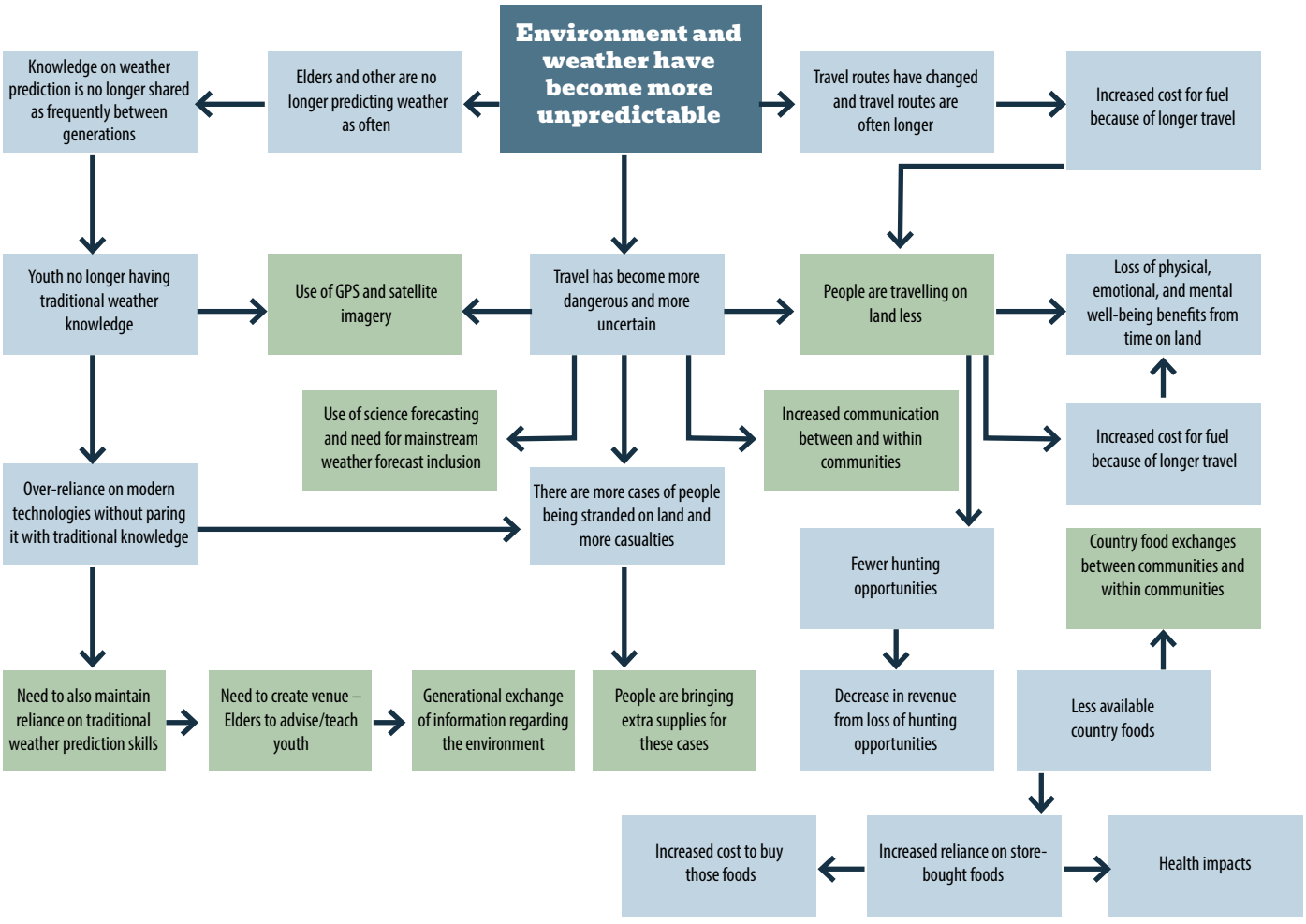
Dolly Varden catches have been poor at Shingle Point in recent years. Shingle Point fishers attribute this to climate-related changes in sea ice and water quality: the fish are likely now further offshore during the period that people are fishing. The Yukon North Slope coastal fishery catches a mix of char stocks, including fish spawning and overwintering in the Firth, Babbage and Big Fish rivers. These prized fish also used to be caught in the Big Fish River but, in 1987, concerns about declining fish numbers led to closure of that fishery. The fisheries co-management group for the Big Fish River established a safe harvest level for the river. Since 2014, Aklavik Inuvialuit have held an Aboriginal communal fishing licence for an allocation of Dolly Varden from the Big Fish River. Harvested fish are distributed to community households. This adjustment of regulations is an example of adapting to the effects of climate change on wildlife by adjusting harvest location. *(Aklavik HTC et al., 2016; Hugall, 2018; DFO, 2018)*



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In response to concerns regarding climate change impacts in Inuit Nunangat and a desire to provide Inuit-led solutions, a pan-Inuit assessment of the impacts of climate change on Inuit communities was released in 2005 (Nickels, Furgal, Buell, & Moquin, 2005). This assessment informed the National Inuit Climate Change Strategy (ITK, 2019b), which identifies a set of climate change mitigation and adaptation actions. It acknowledges that Inuit communities will be some of the most severely affected and that these effects are wide-ranging and often unique to the North (Figure 3). The national strategy informs this Plan throughout.

Figure 2. Weather-based impacts on traditional use and responses



Source: Unikkaaqatigiit – Putting the Human Face on Climate Change (Communities of Aklavik, Inuvik, Holman Island, Paulatuk and Tuktoyaktuk; Nickels, Buell, Furgal, & Moquin, 2005).

Priorities

Monitor climate change impacts on traditional use using Inuvialuit knowledge, community-based monitoring and Western science. Tracking the effects of climate change is central to mitigation and successful ongoing adaptation. Inuvialuit communities are on the frontline of climate change and the direct and indirect effects to date on traditional use are documented. With appropriate support, Inuvialuit as traditional users of the Yukon North Slope are best equipped to provide up-to-date information and on-the-ground observations, and to produce locally relevant, innovative mitigation and adaptation strategies. Ensuring that Inuvialuit continue to access and use the Yukon North Slope will be increasingly important as it will enable Inuvialuit observations and, in turn, contributions to an evolving body of knowledge about the region. Place-specific monitoring programs, like those on Herschel Island–Qikiqtaruk Territorial Park, should be considered for places like the Shingle Point camps where changes to the harbour, the integrity of the spit, and the condition of drinking water sources could be documented.

Mobilize Inuvialuit and scientific knowledge of the climate change impacts on Yukon North Slope, along with culturally informed adaptations, to ensure ongoing and adequate Inuvialuit traditional use. This will involve collaboration among Inuit regions and communities, hunters and trappers committees, Inuvialuit knowledge holders, and government, academic and other research organizations. Working together and sharing knowledge is essential given the complexity of the problems faced and the rapidity of change. Management partners rely on this knowledge to inform their understanding on Inuvialuit traditional use of the Yukon North Slope within the context of climate change and to introduce and adapt management strategies as new information becomes available.

Work to develop infrastructure support associated with investments in Inuvialuit traditional use (see Strategies A2 and C1). This support contributes to adaptive management strategies and mitigation of the increased costs borne by Inuvialuit in travel, equipment, and camp construction and restoration.

Outcomes

1) Effects of climate change on the ability of Inuvialuit to effectively use the Yukon North Slope are documented and used to identify harvester support requirements and harvest planning and management processes for the region.
2) Inuvialuit who use the Yukon North Slope are active leaders and participants in climate change mitigation and adaptation planning for the region.
3) Inuvialuit and scientific knowledge of climate change impacts are used to inform planning and management of Inuvialuit traditional use of the Yukon North Slope.
4) Inuvialuit continue to safely access and utilize the Yukon North Slope, including offshore areas, for traditional activities and to meet their requirements for a traditional way of life.

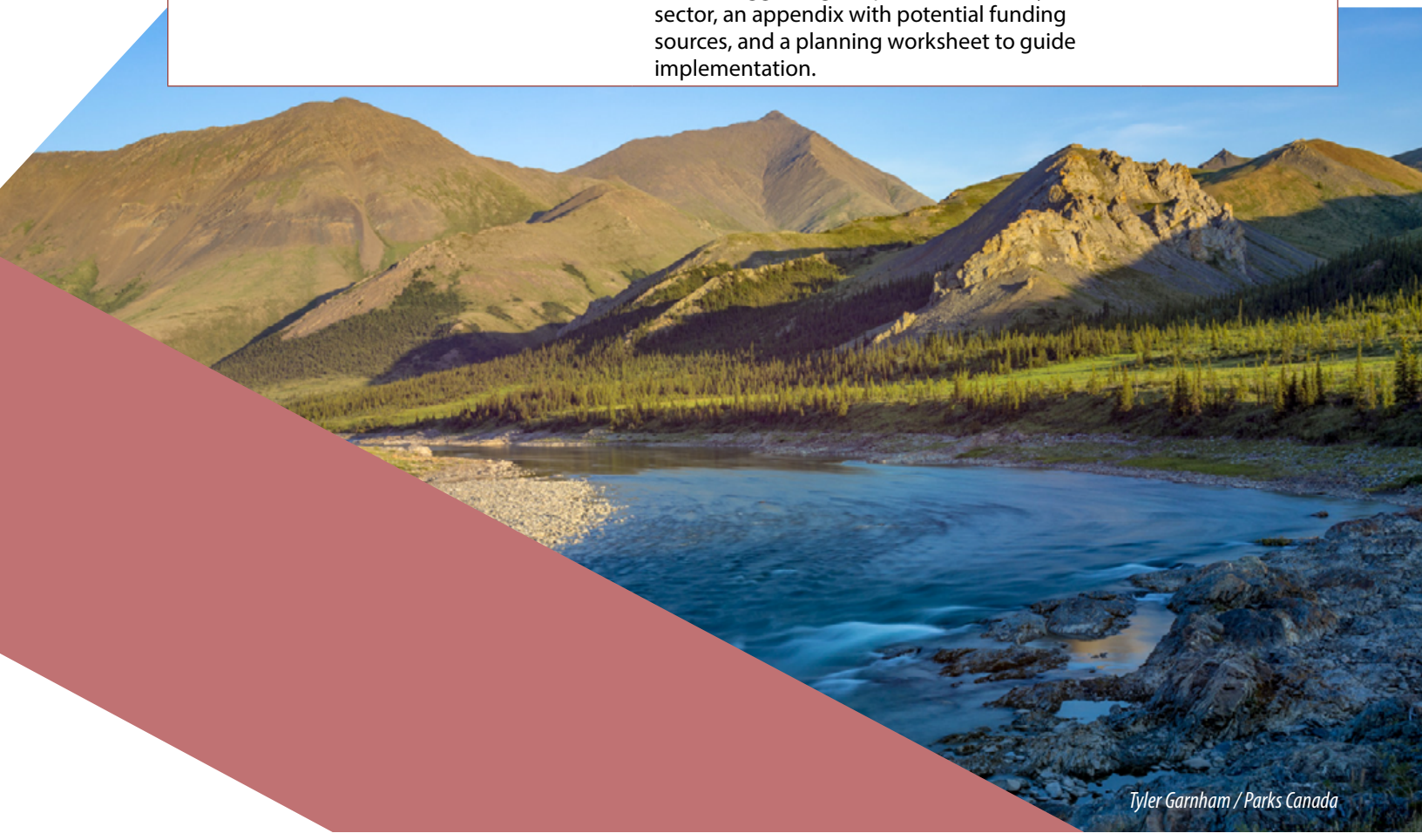
Links to Plans and Programs

Table 11. Strategy C3: Studies and strategies linked to climate change and traditional use

Plan or Program	Role in Informing Climate Change Impacts on Inuvialuit Traditional Use and Supporting Adaptive Management	Link to Outcomes
Monitoring and Research Programs		
Ivvavik National Park Ecological Monitoring Program (Parks Canada, 2018); Herschel Island–Qikiqtaruk Inventory, Monitoring, and Research Program (Cooley et al., 2012)	Ivvavik National Park and Herschel Island–Qikiqtaruk Territorial Park are committed to sharing information related to changes in the environment and environmental stressors. Ivvavik National Park is a benchmark for measuring changes in ecosystem integrity.	1
Inuvialuit Settlement Region Community-Based Monitoring Program	The Inuvialuit Settlement Region Community–Based Monitoring Program includes: the Inuvialuit Harvest Study, Imaryuk Monitoring Program, and Munaqsiyit & SmartICE implementation. All of these programs involve the collection and mobilization of information relevant to climate change impacts on Inuvialuit traditional use and supporting adaptive management.	1, 2, 3, 4
Aklavik Inuvialuit Traditional Knowledge Studies: see Table 9	These studies document how Inuvialuit use of selected wildlife species has changed over time.	1
Strategies and Studies		
Unikkaaqatigiit – Putting the Human Face on Climate Change: Perspectives from the Inuvialuit Settlement Region (Communities of Aklavik, Inuvik, Holman Island, Paulatuk and Tuktoyaktuk; Nickels, Buell, Furgal, & Moquin, 2005)	This report includes Inuvialuit observations and views on climate-driven environmental and socio-economic changes as they affect the communities of Aklavik, Inuvik, Tuktoyaktuk, Ulukhaktok and Paulatuk as well as suggestions for mitigation of impacts and adaptation.	1, 2, 3
National Inuit Climate Strategy (ITK, 2019b)	This report is a national policy initiative by the Inuit Tapariit Kanatami to mitigate and adapt to the effects of climate change on Arctic ecosystems, including shifting and/or declining wildlife and fish populations and loss and/or damage to harvesting equipment and infrastructure.	1, 2, 3

Table 11. Continued

Plan or Program	Role in Informing Climate Change Impacts on Inuvialuit Traditional Use and Supporting Adaptive Management	Link to Outcomes
Strategies and Studies		
Inuvialuit on the Frontline of Climate Change: Development of a Regional Climate Change Adaptation Strategy (IRC, 2016a)	This report is a follow-up to the ISR Regional Climate Change Strategy Meeting, held March 21–24, 2016, in Inuvik. The report documents the feedback from participants on perceptions of climate change impacts and suggestions for adaptation, including guiding principles for an Inuvialuit-specific approach to adaptation. The report contains an adaptation plan for each ISR community.	1, 2, 3
Climate Change Adaptation Plan: Community of Aklavik, Northwest Territories (Friendship & Community of Aklavik, 2011)	This report stems from a series of workshops where Aklavik community members discussed ideas for climate change adaptation specific to the Aklavik context. This document includes a table suggesting adaptation actions by sector, an appendix with potential funding sources, and a planning worksheet to guide implementation.	1, 2, 3



Tyler Garnham / Parks Canada

Objective D.
Environmental Protection Measures

Manage risks, from human activities to ecosystems and wildlife and to the safety and quality of harvested foods.

The IFA established a broad legal foundation to conserve and protect the Yukon North Slope environment. In addition to the area-based conservation requirements described in Objective A, it provided for the participation of Inuvialuit through their own organizations and co-management bodies to advise on all matters related to policy, legislation, regulation and administration with regard to wildlife, conservation, research, management, and enforcement.

In addition to the environmental protections for Ivvavik National Park and Herschel Island-Qikiqtaruk Territorial Park provided through the IFA and the *Canada National Parks Act and Yukon Parks and Land Certainty Act*, the IFA established an environmental impact assessment process to screen and review development proposals in the ISR. Special provisions in the IFA apply when considering developments – typically, large scale – that could affect the Yukon North Slope.

The IFA also includes wildlife compensation provisions that apply to developments in order to prevent damage to wildlife and their habitat which disrupt harvest activities, and, in the event of damage, to restore wildlife and its habitat as far as practicable to its original state and to compensate Inuvialuit harvesters for loss of harvesting opportunities.

Based on past history in the region, these requirements applicable to larger industrial-scale developments would largely apply to offshore hydrocarbon exploration and development activity. However, increasing marine shipping in the Beaufort Sea, which is associated with longer ice-free periods for transit, requires new attention as well. Such marine shipping traffic will likely have impacts on wildlife, such as marine mammals, sea ducks, brant, and other marine migratory bird species. Both large scale development and increased shipping activity are of special concern as the coastal areas of the Yukon North Slope are especially vulnerable to contamination and pollution from offshore oil and gas spills.

Attention to legacy environmental and human impacts from contaminants and pollution has revolved around key events and activities in the Inuvialuit Settlement Region reaching far back in time: the cleanup of chemical contamination from the 1950s through the 1990s – such as polychlorinated biphenyls (PCBs), lead and paint thinners – from the construction and operation of the Distant Early Warning System station; to the 1970s and 1980s and the long-term maintenance and stability of drilling mud sumps intended to encapsulate drilling wastes within frozen ground subject to permafrost degradation; and to 1986 and the explosion of the nuclear power plant in Chernobyl (former Soviet Union) and the long-range transport of a radioactive cloud of cadmium and cesium and concerns of deposition on vegetation, notably lichen consumed by caribou. Concern today over the potential impact of contaminants and pollution on the Yukon North Slope is, in part, a function of the important link between wild food consumption and food security and human health.

Strategy D1.
Regulatory Regime

Contribute to improved regulatory decision-making and management policies and processes to conserve the Yukon North Slope environment, wildlife, habitat and traditional use.

How this Strategy Contributes to the Plan Goal

Work under this strategy will contribute to the ongoing improvement of decisions about the potential application of legal protections and management policies consistent with the goal of the Plan and the IFA.

Background

The basic requirements of the IFA's environmental screening and review processes as they apply to the Yukon North Slope are set out in the IFA (as revised in 2005) and supplemented by various guidance and procedural documents developed by the Environmental Impact Screening Committee and Environmental Impact Review Board that are updated periodically.

The *Yukon Environmental and Socio-Economic Assessment Act* (YESAA) (as revised 2016) also established a process for the screening and review of developments on the Yukon North Slope. The overlap between the IFA and YESAA processes has given rise to requests from the Inuvialuit Regional Corporation and Inuvialuit Game Council to the Government of Canada that the duplication and any infringement on the IFA process should be addressed.

In circumstances where the federal *Impact Assessment Act* (2019) could apply on the Yukon North Slope, such as in cases where a development will cross jurisdictional boundaries, results in trans-boundary effects, or raises issues of national concern, or in cases where the Inuvialuit or Yukon request a federal assessment, cooperation agreements may be required to ensure that the respective requirements of overlapping impact assessment legislation are addressed.

The Inuvialuit Regional Corporation and the Inuvialuit Game Council have prioritized proactive vessel management and low-impact shipping corridors as initiatives to be pursued in the ISR.

In 2000 the *National Parks Act* was amended to recognize and protect the traditional harvesting rights of Inuvialuit and other Indigenous Peoples in national parks. However, accompanying regulations associated with harvest management, enforcement and other Inuit-based land use activities have yet to become law.

ISR shipping workshops (2018 + 2020)

The Inuvialuit Game Council and Regional Corporation hosted workshops in June 2018 and February 2020 for Inuvialuit organizations to discuss ongoing and anticipated shipping activity in the ISR, shipping-related concerns and opportunities for coordination and collaboration. Regulatory gaps, enforcement and jurisdiction were identified as key shipping-related issues.

The time and complexity of processes required to enact a regulation has impacts on management of species harvest where total allowable harvest levels and quotas are used to ensure sustainable wildlife populations. As a result, by the time new regulations are in place, the management circumstances the regulations were designed to address may have changed due to new information or unanticipated impacts and events. Maintaining sustainable wildlife populations and optimizing harvest opportunities requires management that is adaptive and flexible from year to year. This is an important consideration because wildlife populations and the harvest are increasingly affected by extreme weather and a changing climate. Successful adaptation may require new approaches to management.

A common concern of Inuvialuit harvesters is the uncertainty generated by the implementation of different harvest regulations between jurisdictions in areas where the precise location of jurisdictional boundaries (such as the Yukon–NWT boundary or the ISR–Vuntut Gwitchin Traditional Territory boundary) is unknown. These circumstances can result in unintended regulatory infractions and attest to the need for better communication among enforcement agencies.

Coordinated tag administration arrangements and regulations for the Southern Beaufort polar bear population among the governments of Yukon and Northwest Territories, Parks Canada and the Inuvialuit Game Council illustrate an approach towards a more efficient and effective regulatory process to address this type of situation.

Enforcement of Hunters and Trappers Committee bylaws on the Yukon North Slope is not a requirement of the IFA. However, with the support of the Inuvialuit, the *Yukon Wildlife Act* was amended to provide for the passage of regulations to adopt HTC bylaws on a case-by-case basis on the recommendation of the WMAC (NS) and subject to ministerial discretion. The process to accomplish this has not been established.

Enforcement of wildlife regulations on the Yukon North Slope has benefitted from agreements among territorial and federal conservation officers to enable the sharing of powers across jurisdictional borders and boundaries, increasing their ability to be present in large remote areas and engage with local people on issues of management interest and concern, especially those that affect harvesting rights. For example, Park Wardens and Yukon conservation officers have had certain powers cross-designated under the *Canada National Parks Act* and *Yukon Wildlife Act*.

Operational arrangement for coordinated tag administration for the Southern Beaufort Sea polar bear subpopulation

This agreement is an example of a unique approach to implementing the IFA and reducing regulatory burden on Inuvialuit. In 2014, the Yukon and Northwest Territories governments, Inuvialuit Game Council, and Wildlife Management Advisory Councils agreed to create a common tag that Inuvialuit could use for harvesting Southern Beaufort Sea polar bears in both the Yukon and the NWT.

Priorities

Support initiatives to review legislative and regulatory gaps and harmonize regulations and regulatory processes to address concerns as they affect the conservation of wildlife, habitat and traditional use on the Yukon North Slope. These initiatives could address concerns and issues such as:

- Marine shipping legislation and regulations
- Environmental assessment legislation and processes
- Federal wildlife animal regulations in national parks
- Yukon regulations enabling coordinated harvest management of select transboundary species and HTC bylaw enforcement

Streamline and harmonize processes for the development and enactment of wildlife harvest-related regulations and bylaws on the Yukon North Slope in support of adaptive management.

Strengthen conservation-related enforcement capabilities of federal and territorial agencies working in partnership with Inuvialuit organizations across the Yukon North Slope through inter-governmental agreements, guardian programs, and increased funding.

Outcomes

1) Legal frameworks and regulatory mechanisms are flexible enough to enable timely and effective protection of Yukon North Slope wildlife, habitat and traditional use, as required.
2) Environmental assessment legislation that applies on the Yukon North Slope is harmonized, avoids duplication and redundancies, and enables best practices in the screening and review of developments on the Yukon North Slope.
3) Enforcement capacities and capabilities are sufficient to effectively conserve and maintain Yukon North Slope wildlife, habitat and traditional use.



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Links to Plans and Programs

Table 12. Strategy D1: Statutes and policies linked to environmental protection

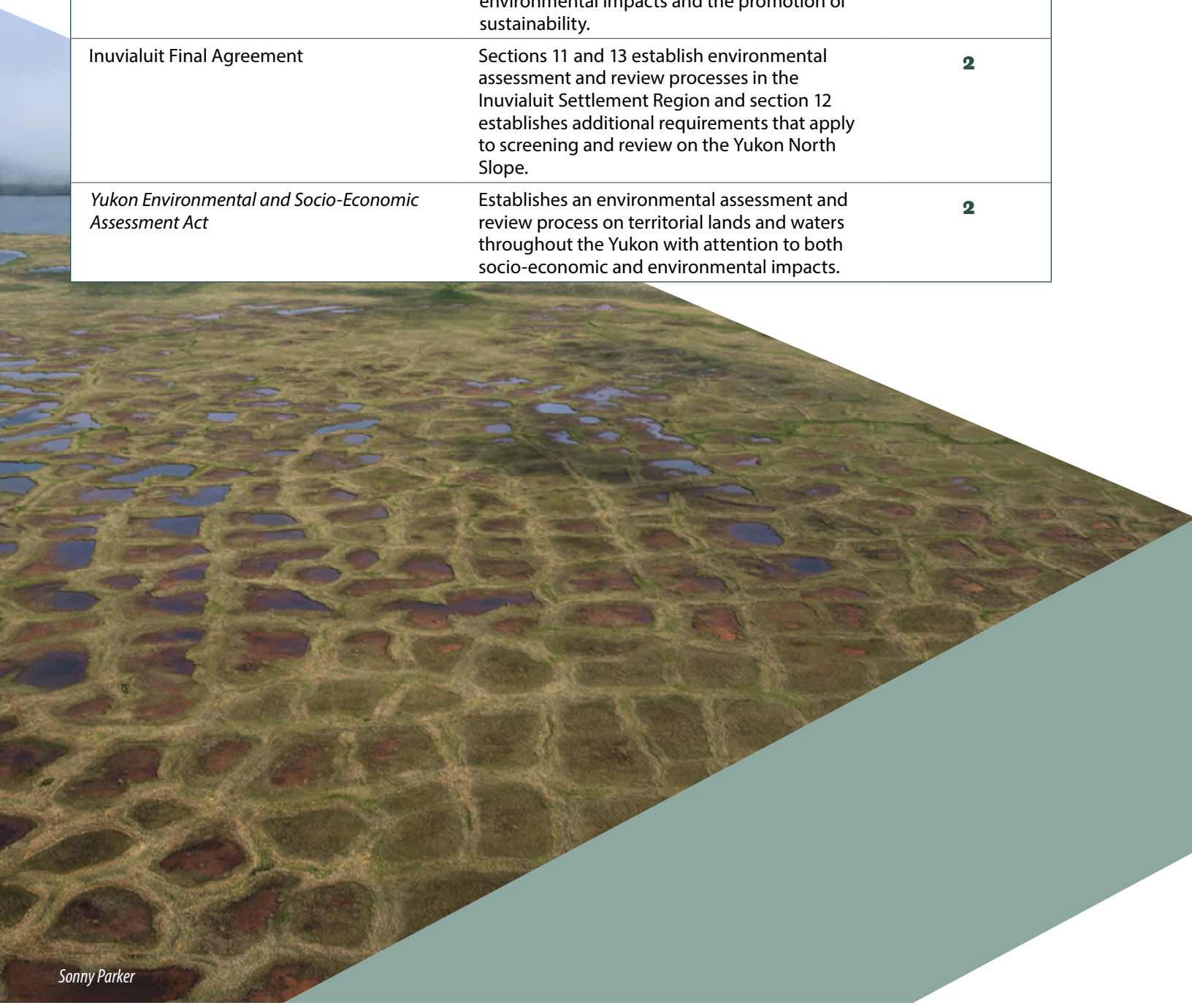
Legislative Instrument	Role in the Protection of the Yukon North Slope Environment	Link to Outcomes
Eastern North Slope Land Withdrawal Orders in Council	The purpose of these Orders is "to withdraw the tracts of territorial lands described in the Schedule to this Order from disposal for the reason that the lands are required for conservation purposes." In effect, these Orders prohibit entry to lands for the purpose of locating a claim or prospecting for gold or other precious minerals or stones, pursuant to the federal and, after devolution, territorial, *Yukon Placer Mining Act* and/or the *Quartz Mining Act*, and the *Territorial Lands (Yukon) Act*.	**1**
Western Arctic (Inuvialuit) Claims Settlement Act	Gives effect to the Inuvialuit Final Agreement and the rights and protections it provides for, as well as the wildlife conservation and management regime for the Yukon North Slope, the environmental screening and review processes that apply to the area and the amendment of the *National Parks Act* to establish Ivvavik National Park.	**1, 2, 3**
Canada National Parks Act and Regulations	Established Ivvavik National Park and enables the management of the park as a wilderness area with allowances for Inuvialuit traditional use consistent with the requirements of the Inuvialuit Final Agreement.	**1, 3**
Yukon Parks and Land Certainty Act and *Herschel Island Park Regulation*	Established Herschel Island–Qikiqtaruk Territorial Park and enables the management of the park to the same standards as Ivvavik National Park and consistent with the requirements of the Inuvialuit Final Agreement.	**1, 3**
Oceans Act and Regulations	Establishes the legal framework for Beaufort Sea ecosystem-based, integrated ocean management and planning and the establishment of the Tarium Niryutait Marine Protected Area.	**1, 3**
Arctic Waters Pollution Prevention Act	The aim of this Act is to prevent pollution in Canadian Arctic waters. The Act is enforced by the *Arctic Shipping Pollution Prevention Regulations* and the *Arctic Waters Pollution Prevention Regulations*.	**2, 4**

Table 12. Continued

Legislative Instrument	Role in the Protection of the Yukon North Slope Environment	Link to Outcomes
Canada Shipping Act	Establishes environmental protections for marine ecosystem and habitats from shipping and associate oil spills.	1, 3
Canadian Environmental Protection Act	Protects the environment and human health from the risks associated with toxic substances and pollution.	1, 3
Yukon Environment Act and Regulations	Provides a legislative framework for the protection of the Yukon's land, water and air.	1, 3
Yukon Waters Act	Establishes a licensing process for the use of water and/or the deposit of waste into water throughout Yukon.	1, 3
Yukon Wildlife Act and Regulations	Provides the legislative framework for the protection of Yukon wildlife and habitat generally and, in Part 13, gives legal effect to the applicable provisions of the IFA that apply on the Yukon North Slope.	1, 3
Northwest Territories Wildlife Act and Regulations	Provides the legislative framework for the protection of Northwest Territories wildlife and habitat generally, and gives legal effect to the applicable provisions of the IFA that apply in the Western Arctic.	1, 3
Canada Wildlife Act and Regulations	Provides for the preservation of habitats that are critical to migratory birds and other wildlife species, particularly those that are at risk, and enables the establishment of Canada Wildlife Areas.	1, 3
Migratory Birds Convention Act and Regulations	Provides for the protection of migratory birds and the establishment of migratory bird sanctuaries.	1
Species at Risk Act and Regulations	Prevents wildlife species in Canada from disappearing, provides for the recovery of wildlife species that are extirpated (no longer exist in the wild in Canada), endangered, or threatened as a result of human activity, and manages species of special concern to prevent them from becoming endangered or threatened.	1, 3
Canada Fisheries Act and Regulations	Provides for the protection of fish and fish habitat and stock and habitat restoration.	1, 3

Table 12. Continued

Legislative Instrument	Role in the Protection of the Yukon North Slope Environment	Link to Outcomes
Canada Impact Assessment Act	Establishes a federal environmental assessment and review process for major projects with attention to both socio-economic and environmental impacts and the promotion of sustainability.	2
Inuvialuit Final Agreement	Sections 11 and 13 establish environmental assessment and review processes in the Inuvialuit Settlement Region and section 12 establishes additional requirements that apply to screening and review on the Yukon North Slope.	2
Yukon Environmental and Socio-Economic Assessment Act	Establishes an environmental assessment and review process on territorial lands and waters throughout the Yukon with attention to both socio-economic and environmental impacts.	2



Sonny Parker

Strategy D2.
Contaminants

Improve knowledge of risks from contaminants to Arctic wildlife and to the safety of country foods. Consider the risks from contaminants in wildlife population management. Participate in initiatives to reduce risks from contaminants and to alleviate concerns about food safety and wildlife health.

How this Strategy Contributes to the Plan Goal

Addressing contaminants in wildlife is relevant to this Plan because the safety and quality of harvested food is a consideration in maintaining Inuvialuit use of the Yukon North Slope; and contaminants can accumulate in some wildlife to levels that damage the health of individual animals or have adverse effects on wildlife populations, such as by reducing reproductive success.

Background

Most contaminants that enter Yukon North Slope ecosystems come from populated, industrialized parts of the world. They have travelled great distances in wind currents, eventually returning to the ground in rain and snow. Contaminants are highest in predators, especially marine mammals and some fish. People who consume these species on a regular basis have the most exposure to contaminants.

Levels of persistent organic pollutants (POPs) have declined in most wildlife in the Canadian Arctic, with some exceptions. Levels of legacy pesticides and PCBs in Beaufort Sea beluga have changed little over the past 20 years.

Some contaminants of emerging concern are increasing, while others are decreasing in Beaufort Sea beluga and in polar bears. Researchers continue to find previously undetected human-made chemicals in Arctic marine mammals, including in Beaufort Sea polar bears. The risks posed by many of these chemicals are not known. This indicates that we do not have the full picture on how contaminants might be affecting wildlife.

Examples of results of contaminants studies on Yukon North Slope wildlife of interest to communities include the following.

- Mercury levels, while elevated in some fish and marine mammals, are very low in Dolly Varden.
- Mercury and cadmium, although they do build up in Porcupine caribou organs, are at safe levels and have not increased in recent years. Other contaminants are very low in Porcupine caribou.
- Community concerns about possible contamination of Beaufort Sea beluga and Porcupine caribou from the 2011 nuclear reactor accident in Japan led to a study that concluded that there was no effect.

Main types of contaminants

- Persistent organic pollutants. Some industrial and agricultural chemicals, including PCBs and DDT, are banned or severely restricted; these are called legacy POPs.
- Contaminants of emerging concern. Many chemicals used in industry and in consumer goods have been detected in Arctic wildlife.
- Mercury and other heavy metals. Metals are a natural part of the environment, but some metals also enter the Arctic from industrial emissions and burning of fossil fuels.

Priorities

Provide information that addresses community concerns about contaminants in harvested wildlife and the quality of wild foods.

Consider the effects of contaminants on animal health and populations in wildlife management planning. Marine predators, including mammals, fish and birds, are the species most at risk.

Support research on contaminants of emerging concern as a priority; support continued monitoring of legacy POPs.

Fill major knowledge gaps about contaminants in the Arctic through support of Yukon North Slope research and monitoring. Major gaps in knowledge include the effects of mixtures of contaminants on wildlife, the population-level impacts of contaminants, and how climate change may increase the risks to wildlife from contaminants.

Outcomes

1) Inuvialuit and others who harvest and consume wildlife from the Yukon North Slope are satisfied that they are informed about results of monitoring and research and that their concerns about food safety are addressed.
2) Risks to wildlife from contaminants are considered in species management plans where these risks may be significant, especially for marine predators.
3) Risks from contaminants to wildlife and to harvested foods on the Yukon North Slope are identified and reduced within the context of national and international studies and actions.

Links to Plans and Programs

Several plans and programs address contaminants issues relevant to the Yukon North Slope, mainly through identifying research and monitoring priorities. The impact of contaminants on animal health is addressed in management plans for polar bears and peregrine falcons, but not in plans for other species.

Table 13. Strategy D2: Plans and programs linked to reducing risks from contaminants

Plan or Program	Role in Reducing Risks from Contaminants in Yukon North Slope Wildlife	Link to Outcomes
Monitoring and Research Programs		
The Northern Contaminants Program (NCP) (Government of Canada, 2018)	Contaminants monitoring and research on Yukon North Slope wildlife is affiliated with the NCP. The knowledge gained is used to support policy and regulatory actions on contaminants. NCP-affiliated work includes: projects on mercury in Babbage River Dolly Varden populations; contaminants in Porcupine caribou; and contaminants in the Beaufort Sea polar bear subpopulation, as part of larger-scale research on contaminants in polar bears. The NCP is a forum for engaging with national and international priorities and actions to control contaminants.	**1, 3**

Table 13. Continued

Plan or Program	Role in Reducing Risks from Contaminants in Yukon North Slope Wildlife	Link to Outcomes
Monitoring and Research Programs		
FJMC Fish and Marine Mammal Community Monitoring Program (FJMC, 2013)	Includes sample collection for contaminants monitoring in the ISR, including fish sampling at Shingle Point. Monitoring of ringed seals harvested from Sachs Harbour (since the late 1990s) and of beluga harvested from Tuktoyaktuk (since the 1980s) continues under this program.	1, 3
Yukon Contaminated Sites Map (Government of Yukon, 2019)	This online tool documents contaminated sites in the Yukon and provides up-to-date information on their status.	3
Place-Based Plans		
Integrated Ocean Management Plan for the Beaufort Sea: 2009 and Beyond (Beaufort Sea Partnership, 2009)	Includes management directions on informing communities about contaminants in country foods and on research and monitoring priorities for contaminants in marine wildlife.	1, 2, 3
Tarium Niryutait Marine Protected Areas Monitoring Plan (DFO, 2013)	Supports continued monitoring of health effects of contaminants in beluga.	3
Aklavik Community Conservation Plan (Aklavik HTC et al., 2016)	Identifies monitoring contaminants in seals as a moderate research priority.	3
Species Conservation and Management		
Porcupine Caribou Management Board (PCMB)	Results of NCP monitoring of caribou for contaminants are regularly presented at PCMB meetings. The PCMB is a forum for addressing concerns about contaminants in caribou.	1, 2
Inuvialuit Settlement Region Polar Bear Joint Management Plan 2017 (Joint Secretariat, 2017)	Identifies contaminants as a medium-level threat to polar bears within the ISR. Identifies knowledge gaps and approaches for filling them, including the need for a long-term plan for monitoring contaminants in polar bears.	2

Strategy D3. Land and Water Pollution

Prevent pollution and identify local sources of waste that could cause contamination of land or deterioration of water quality. Eliminate and prevent accumulation of non-biodegradable wastes.

How this Strategy Contributes to the Plan Goal

Protecting the quality of the Yukon North Slope's environment is fundamental to ensuring that wildlife and their habitats are conserved, and that Inuvialuit traditional use is sustained.

Background

The Yukon North Slope has few local sources of pollution. A past source of localized land contamination was military activity at the Distant Early Warning Line sites. Contaminated soils and sources of contamination at Komakuk Beach, Stokes Point, and Shingle Point were cleaned up or stabilized. Cleanup of Distant Early Warning Line sites across Canada was completed in 2014, with site monitoring planned for a 25-year period. Old fuel caches and empty fuel barrels remaining from past industrial activity were removed in the 2000s, though some fuel barrels remain.

With no year-round communities, there is limited ongoing generation of domestic waste. Disposal of human waste and garbage at park facilities and campsites, however, has the potential to contaminate land and water and to attract wildlife if proper procedures are not followed.

The accumulation of non-biodegradable wastes, even if not causing chemical contamination, is a visual pollutant detracting from a wilderness environment.

Shingle Point Camp Waste

A barge-load of garbage that had accumulated at cabins and camps at Shingle Point was cleaned up in 2015 through an initiative called "Clean Coast, Clean Camps", sponsored by the World Wildlife Fund and the Yukon government. There is no system in place to prevent garbage building up. Solutions that have been discussed include more emphasis on bringing garbage back at the end of the season and providing barrels for cans and burnables at Shingle Point cabins. *(Michelle Gruben, Aklavik HTC, personal communication, May 2019)*

Pollutants also travel to the Yukon North Slope by air and water. Small amounts of pollutants from industrial and agricultural areas are widespread through all of Earth's ecosystems, including in the Yukon North Slope. These persistent pollutants are the subject of the Strategy D2 Contaminants. Some pollutants are also greenhouse gases, e.g., soot, black carbon from fires, carbon dioxide and methane. Anthropogenic greenhouse gas production contributes to climate change, a recurrent theme throughout this Plan.

Fresh surface water and groundwater are well protected, as rivers and aquifers originate on the North Slope (Yukon and Alaska) in areas without local sources of pollution. However, the nearshore waters along the Yukon Coast are strongly influenced by outflow from the Mackenzie River, a potential source of pollutants. An emerging issue is the spread of plastic waste, especially very small particles of plastics (microplastics) throughout the world's oceans, including to Arctic waters.

The pollution risk with the most severe consequences is the risk to coastal waters, shorelines, estuaries and marine and coastal wildlife should there be a spill or major accident from marine oil and gas development or from a ship.

Priorities

Prevent marine oil spills and prepare for spills and accidents that might threaten Yukon North Slope marine and coastal ecosystems through engagement with programs and organizations active in spill preparedness.

Safely dispose of human waste and garbage to avoid contamination of land or water and to avoid attracting wildlife.

Eliminate non-biodegradable waste on the landscape, including abandoned fuel barrels.

Track pollution issues that have the potential to affect Yukon North Slope environmental quality, including marine and freshwater plastics, noise pollution, pollution related to increasing Arctic marine shipping, and the flow of pollutants in Mackenzie River water. Monitor the extent of the effects on the Yukon North Slope, as needed, and engage with programs and organizations to prevent or mitigate the pollution at its source.

Outcomes

1) Appropriate authorities advocate for oil spill preparedness measures to protect and respond to spills that might threaten Yukon North Slope marine and coastal ecosystems.
2) Management of human waste and garbage at locations with repeated use is sufficient to prevent pollution of water and land.
3) Appropriate authorities advocate for abandoned non-biodegradable waste removal and help to establish measures to prevent its accumulation.

Links to Plans and Programs

Table 14. Strategy D3: Land and water pollution

Plan or Program	Role in Preventing or Responding to Land or Water Pollution	Link to Outcomes
Beaufort Regional Coastal Sensitivity Atlas (Government of Canada, 2015)	This atlas identifies 22 different shoreline types along the Beaufort Coast. For each shoreline type, the report describes how oil behaves when it comes into contact with the substrate, then recommends spill response tools and cleanup techniques.	1
Aklavik Adaptation Plan 2016 (IRC, 2017)	Aklavik's adaptation plan identifies actions that the community can take to manage, reduce, and remove waste in the community and on the land.	2, 3
Oceans Protection Plan (Transport Canada, 2019)	Transport Canada's Oceans Protection Program initiative will invest $1.5 billion in protecting Canada's coasts and waterways. This includes a focus on improving oil spill response capacity and restoring vulnerable ecosystems, among other actions.	1, 2, 3
Mackenzie River Basin Board and Mackenzie River Basin Transboundary Waters Master Agreement	Interjurisdictional board involving provinces, territories, and the federal government to maintain the ecological integrity of the Mackenzie River Basin. The agreement makes provision for jurisdictions to negotiate bilateral water management agreements to address water issues at transboundary streams and to provide parameters on the quality, quantity and flow of water.	1
Inuvialuit Settlement Region Community-Based Monitoring Program: Munaqsiyit	One of the aims of Munaqsiyit is to identify legacy waste sites as well as areas of environmental disturbances which would have future impacts on lands and wildlife.	2, 3

Objective E. Evidence in Support of Decisions

Support evidence-based decisions related to Yukon North Slope wildlife, wildlife habitat, and Inuvialuit traditional use by providing accessible information, advice on conservation requirements, and guidance on monitoring and research. Both Inuvialuit and scientific knowledge should be used to achieve conservation objectives.

The foundation of this Plan is the body of knowledge on Yukon North Slope ecosystems, wildlife, habitat and Inuvialuit traditional use. Implementation of the Plan's strategies requires maintaining and building on this body of knowledge. Table 15 provides some examples of types of information that will be needed to achieve the objectives of this Plan.

Select sections from the IFA Wildlife Harvesting and Management Principles

14. (1) A basic goal of the Inuvialuit Land Rights Settlement is to protect and preserve the Arctic wildlife, environment and biological productivity through the application of conservation principles and practices.

14. (2) In order to achieve effective protection of the ecosystems in the Inuvialuit Settlement Region, there should be an integrated wildlife and land management regime, to be attained through various means, including the coordination of legislative authorities.

14. (3) It is recognized that in the future it may be desirable to apply special protective measures under laws from time to time in force, to lands determined to be important from the standpoint of wildlife, research or harvesting. The appropriate ministers shall consult with the Inuvialuit Game Council from time to time on the application of such legislation.

14. (4) It is recognized that one of the means of protecting and preserving the Arctic wildlife, environment and biological productivity is to ensure the effective integration of the Inuvialuit into all bodies, functions and decisions pertaining to wildlife management and land management in the Inuvialuit Settlement Region.

14. (5) The relevant knowledge and experience of both the Inuvialuit and the scientific communities should be employed in order to achieve conservation.

There are a number of channels through which research is conducted on the Yukon North Slope. Academic researchers have a long history of working on Qikiqtaruk (Herschel Island), along the coast, and elsewhere. Increasingly, there is pressure on these researchers to ensure that their work supports and is informed by community concerns and values, as well as the insights of IFA bodies. Community awareness and meaningful engagement have become hallmarks of high-quality, successful research in the North.

The Government of Yukon and the Government of Canada also conduct ecological research on the Yukon North Slope. Proposed IFA-funded research projects are submitted to WMAC (NS); collaboratively with the Aklavik HTC, WMAC (NS) will provide recommendations on proposed research. Often, this IFA-based funding for wildlife research is supplemented by contributions from government programs and academic institutions.

Anyone conducting research on the Yukon North Slope must obtain the necessary permits, which will depend on the type and location of the work proposed. Some research is also required to proceed through the regulatory screening and review process established under the IFA.

Of course, Inuvialuit travelling through and living seasonally on the Yukon North Slope are also collecting information on wildlife, weather conditions, environmental change, and other factors, albeit in an informal way.

Table 15. Examples of information needed to implement this Plan

Objective A.
Implementation of a conservation framework, based in the IFA, that includes existing and further effective area-based conservation and economic benefits for Inuvialuit.
Examples of Information Needed to Meet Objective A • Spatial information on wildlife habitat use and Inuvialuit traditional use: to support conservation policy, such as decisions about protection measures for key areas • Information on wildlife populations that extend beyond the Yukon North Slope, including information on factors that might affect abundance: to support decisions about interjurisdictional arrangements • Socio-economic data and analyses, such as cost-benefit analyses and trends in cultural and nature tourism: to help plan Yukon North Slope economic initiatives

Table 15. Continued

Objective B.
Conserve habitats that support the diversity and abundance of wildlife populations and habitat on the Yukon North Slope to maintain their quality and long-term productivity and support sustainable harvests that meet Inuvialuit food and cultural needs.
Examples of Information Needed to Meet Objective B • Monitoring of habitat use and understanding of how climate change is affecting wildlife habitats: to inform wildlife management decisions and forecast future habitat conditions • Population monitoring, including measures such as age and sex structure, growth rates and body condition; and research: to help understand relationships with stressors, to support management decisions, including setting of harvest quotas
Objective C.
Maintain and enhance Inuvialuit traditional use in the context of changing socio-cultural, economic and environmental conditions.
Examples of Information Needed to Meet Objective C • Spatial and non-spatial information on traditional use areas to document shifts in their condition, use and significance: to inform decisions about measures to enhance traditional use and mitigate or avoid adverse impacts to traditional use • Traditional knowledge about variable and changing climate, land and water conditions: to help adapt to the effects of climate change
Objective D.
Manage risks from human activities to ecosystems and wildlife and to the safety and quality of harvested foods.
Examples of Information Needed to Meet Objective D • The range of knowledge and data on wildlife and Inuvialuit traditional use that is needed to achieve other objectives in this Plan is also required for assessing proposed developments and managing permitted activities. Knowledge syntheses and tools for analyzing information about specific locations or potential stressors are also needed • Understanding of status and trends of contaminants in wildlife and the risks they pose to wildlife and to food safety: to reduce risk from contaminants

Work under Objective E is aimed at maintaining information records, improving the knowledge base, and making information accessible to decision makers at all levels – from individuals making decisions about their own activities to governments and organizations making decisions with potential effects on wildlife or Inuvialuit traditional use on the Yukon North Slope. The highest priority is to maintain, enhance and make accessible the knowledge base that supports the conservation requirements identified in this Plan.

Strategy E1.
Knowledge Base

Maintain and build on the existing knowledge base on wildlife, wildlife habitat, and Inuvialuit traditional use on the Yukon North Slope. Make information available in formats suitable for a range of audiences and provide tools to assist in retrieving and analyzing different types of information.

How this Strategy Contributes to the Plan Goal

Work under this strategy maintains and builds on the knowledge base that supports decisions on conservation of wildlife, habitat, and Inuvialuit traditional use on the Yukon North Slope.

Background

Relevant sources of knowledge for conservation and management on the Yukon North Slope include Inuvialuit traditional knowledge, observations, monitoring and research. The knowledge base needed for wildlife conservation and management encompasses the broad topics of Inuvialuit traditional use, wildlife habitat and populations, climate and environmental change, ecological functions and processes, and effects of environmental stressors on ecosystems. In addition, socio-economic information will be needed to facilitate economic initiatives in line with the conservation imperative for the Yukon North Slope described in the IFA.

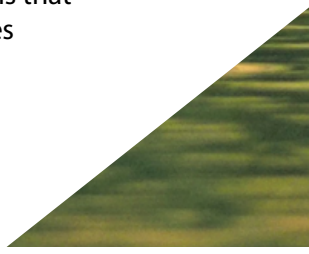
A good knowledge base exists for the Yukon North Slope, which is relevant to and accessible for wildlife conservation and management. This includes: a wealth of Inuvialuit traditional knowledge, much of which has been documented in publicly available reports (see Strategy C1); monitoring and research on wildlife populations and habitat use, with an especially extensive body of work on the Porcupine Caribou Herd; and long-term research and monitoring projects on ecosystems, such as on coastal erosion, permafrost changes, and effects of climate change on vegetation communities (see Strategy B3). Climate change will continue to present challenges. Research reports and plans commonly identify knowledge gaps related to the uncertainty and effects of climate change. Several important areas for which better information or understanding of processes is required are identified in the discussions on strategies in Appendix 1, although this Plan does not present a comprehensive assessment of knowledge needs.

Priorities

Inuvialuit and Western scientific knowledge are considered equally and the best available knowledge is used in decision-making and management. The Yukon North Slope knowledge base will evolve over the lifetime of this Plan. Decision-making should mirror that evolution in its responsiveness and adaptability.

Update as needed the conservation requirements for wildlife, habitat and Inuvialuit traditional use identified in this Plan, and the information that supports these requirements. Make these updates available to a range of decision makers, including IFA organizations. Knowledge sharing will be guided by the appropriate policies, consent documents and data sharing agreements.

Enhance the maintenance, transfer and mobilization of Inuvialuit knowledge of the Yukon North Slope and the traditional skills that put this knowledge into practice. Initiatives



include ongoing assessment of knowledge gaps and areas where information from traditional knowledge should be updated.

To support decision-making, explore collaborative data sharing tools that allow the user to access, view and summarize the spatial data on environmental, ecological and cultural values. There are a number of existing tools that may be appropriate, including the Inuvialuit Settlement Region Online Platform. The tools should provide an efficient way to manage Yukon North Slope spatial information, including updates to existing data and new types of information, with the ultimate goal of informing decision-making.

Outcomes

1) The priority conservation requirements identified in this Plan for wildlife, habitats and Inuvialuit traditional use, and the information to support these requirements, are revised and expanded as needed and are available to decision makers.
2) Options have been evaluated for online tools for combining, viewing and analyzing spatial data, and, if feasible, such tools have been developed and are available.
3) Inuvialuit traditional knowledge is increasingly recognized, valued, and applied.
4) Results of research, monitoring and studies that document Inuvialuit traditional use and knowledge are reported and accessible; data and associated information are archived for future reference. Traditional knowledge is only shared and accessible following appropriate consent protocols.



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Links to Plans and Programs

Monitoring and research programs have their own procedures for maintaining data records and associated information, such as through government agencies or research institutes. Academic research is typically published in scientific journals. Full archiving of research data records should be encouraged, to ensure that studies can be repeated and that more detail, such as location-specific results, can be accessed. Table 16 lists platforms and programs that consolidate or provide information on knowledge-based initiatives that include the Yukon North Slope.

Table 16. Strategy E1: Plans and programs linked to maintaining the Yukon North Slope knowledge base

Plan or Program	Role in Maintaining the Yukon North Slope Knowledge Base	Link to Outcomes
Inuvialuit Settlement Region Community-Based Monitoring Program (CBMP)	The Inuvialuit Settlement Region CBMP includes: Inuvialuit Harvest Study, Imaryuk Monitoring Program, Munaqsiyit & SmartICE implementation. The ISR-CBMP is actively working towards becoming the hub for Inuvialuit community-based monitoring.	1, 3, 4
ISR Online Platform (Beaufort Sea Partnership, 2020)	A web-based platform for central storage of spatial and non-spatial information with tools for online mapping and spatial analysis. Datasets include marine species and ecological information.	3
ISR Traditional and Local Knowledge Research Publication Catalogue (Joint Secretariat, n.d.)	Online database containing references for ISR traditional and local knowledge research publications. The catalogue is supported by a partnership between the Joint Secretariat, Inuvialuit Regional Corporation, and the Beaufort Sea Partnership.	3
Inuit Qaujisarvingat (ITK, 2019a)	An Inuit research centre hosted by Inuit Tapiriit Kanatami (ITK). Provides information on research and related programs. For example, the centre hosts a mapping application for Inuit food security (ITK 2018a).	3
Parks Canada nation-wide Information Centre for Ecosystems	The information centre is an online platform that houses all monitoring data for Ivvavik National Park. Data can be extracted from the system on request.	3
Yukon Conservation Data Centre (Environment Yukon, 2019)	This online database provides information on species and ecosystems at risk and invasive species. Data can be viewed on maps using online tools.	3

Table 16. Continued

Plan or Program	Role in Maintaining the Yukon North Slope Knowledge Base	Link to Outcomes
Arctic Biodiversity Data Service (CAFF, 2019)	An online data management system for circumpolar Arctic biodiversity data. The system is developed and hosted by the biodiversity working group of the Arctic Council. The platform allows for discovery, archiving and data access.	3
Local Environmental Observer Network (LEO)	LEO is an online platform and network of local observers and topic experts who share knowledge about unusual animal, environment and weather events.	3
Arctic Borderlands Ecological Knowledge Society (ABEKS)	ABEKS has a database of interviews with local experts, including Yukon North Slope users. The interview data tracks over 75 indicators of ecological change.	2

Strategy E2. Guidance to Researchers

Provide guidance for conducting research on Inuvialuit traditional knowledge and use, wildlife, habitat and ecosystems on the Yukon North Slope, including advice on involving communities and reporting on research results.

How this Strategy Contributes to the Plan Goal

Work under this strategy facilitates research and monitoring that provides information to support conservation of wildlife, habitat and Inuvialuit traditional use on the Yukon North Slope.

Background

Research on ecosystems, wildlife and traditional use on the Yukon North Slope contributes to understanding wildlife population needs and the causes of changes in wildlife and harvesting practices. Several long-term research projects have greatly improved understanding of effects of climate change, for example on permafrost, coastal erosion, vegetation and caribou. This research, along with traditional knowledge of the Yukon North Slope's ecosystems and wildlife, wildlife surveys and other monitoring, and advances in remote sensing and modeling techniques, has improved the capacity to forecast the scale and types of changes anticipated as climate change progresses. As is clear throughout this Plan, ongoing research relevant to Yukon North Slope conservation is needed to help anticipate and adapt to change.

Priorities

Provide guidance to conservation researchers on working within the existing IFA governance structure. This includes early and ongoing engagement by researchers with Inuvialuit organizations and communities, research that responds to Inuvialuit needs and priorities, and work that supports evidence-based decision-making for the Yukon North Slope. Use of appropriate methods, including community-driven research, respecting Inuvialuit policies (e.g., the WMAC (NS) traditional knowledge policy) and appropriate reporting of results back to Inuvialuit organizations and communities is key.

Develop partnerships with researchers to facilitate research activities that support the implementation of this Plan, and use this collaboration to make research relevant to and accessible for Yukon North Slope conservation and management.

Support Inuvialuit self-determination in research, including through collaborative research, community-led research and community-based monitoring. This includes opportunities for Inuvialuit leadership, training, capacity-building and economic benefits related to conservation research and monitoring (see also Strategy A2 conservation-based economy).

Explore ways to improve open access to research data and results of analyses. This includes:

- Respect for intellectual property rights, privacy, and the sensitivity of some types of cultural and biological data.
- Open access to scientific research and monitoring data for the Yukon North Slope when appropriate.
- Open access to publications of research results, including scientific journal articles from Yukon North Slope research projects. Manage Yukon North Slope spatial information, including updates to existing data and new types of information, with the ultimate goal of informing decision-making.

Outcomes

1) Inuvialuit are involved in conservation research and monitoring initiatives on the Yukon North Slope, with increased opportunities for training and building tangible skillsets that can be applied to long–term opportunities such as: research design informed by Inuvialuit and scientific methodologies, data collection and management, training in new technologies, data synthesis into written and oral reports, and communicating new knowledge with the public and researchers.
2) Guidance is provided on an ongoing basis to researchers and others in setting priorities for addressing knowledge gaps, applying research results to conservation and management, and respectful conduct of collaborative research on the Yukon North Slope.
3) Partnerships with researchers are effective in facilitating access to expert knowledge and results of research to address conservation and management issues on the Yukon North Slope.
4) Access to data and publications from Yukon North Slope research is improved.

Links to Plans and Programs

Table 17 lists plans and programs that provide guidance to researchers and address Inuvialuit capacity and leadership in research.

Table 17. Strategy E2: Plans and programs linked to research guidance

Plan or Program	Role in Providing Guidance to Researchers	Link to Outcomes
Yukon North Slope Research Guide (WMAC [NS], 2008)	The research guide is a resource document for both researchers and communities. It clarifies expectations and provides guidance to help communities and researchers work together.	1
Traditional Knowledge Research Guide (Armitage & Kilburn, 2015)	A reference guide for researchers planning to conduct traditional knowledge research on the Yukon North Slope.	1
Guidelines for conducting research for Parks Canada (Parks Canada, 2017) and Government of Yukon (Government of Yukon, 2013)	Government agencies provide information and guidance on conducting research and on obtaining research permits for Ivvavik National Park and research licences for Herschel Island and Aullaviat/Anguniarvik.	1
National Inuit Strategy on Research (ITK, 2018)	Strategy for coordinated approach to research in Inuit Nunangat. The strategy includes objectives and actions relevant to research agencies and to researchers. Topics covered: advancing Inuit governance in research; enhancing ethical research conduct; aligning funding with Inuit priorities; ensuring Inuit access, ownership and control over data and information; and building research capacity.	1, 2
IRC Innovation, Science & Climate Change (ISCC) Branch	This branch leads and coordinates research in several key areas on behalf of the IRC: environmental policy, data mobilization/ cyber infrastructure, community economic development, and health and engagement. The Inuit Research Advisor is housed within the ISCC; this position acts as a point of contact for proposed and ongoing research in the ISR. Coordination for marine-protected areas, traditional and local knowledge, and community-based monitoring also overlap with the ISCC.	1, 2, 3, 4



Peter Mather

Part III.
Implementation

The Yukon North Slope Wildlife Conservation and Management Plan will guide the parties responsible for implementing this Plan for the next ten years. Given the rapid pace of change on the Yukon North Slope, the Plan should be considered a living document to be used and adapted as conditions change and issues arise. The ten-year timeframe was chosen with the pace of climate-related changes to the Yukon North Slope in mind – this region could look very different within the next decade. The Plan should be used in setting priorities and allocating resources as part of the ongoing work of the parties responsible for implementing this Plan (see Figure 1 in the Introduction).

The Plan sets out priorities of conservation and management on the Yukon North Slope. Some of these priorities are already being implemented, and some will require additional action to implement.

The ten-year implementation period will start when the Plan is published.



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Part IV.
Appendices

Appendix 1. Featured Wildlife Species and Species At Risk

The following pages, which form part of the strategies under Objective B Wildlife, provide information on habitats and populations for the featured wildlife species. Information is drawn from Inuvialuit traditional knowledge studies, surveys, assessments and research projects. Habitat is described and mapped in different ways, depending on the characteristics of the species and the information available for each species. The knowledge base for caribou, for example, is extensive, while, at the other extreme, little is known about areas of high use for broad whitefish.

Habitat models are used to estimate the distribution of suitable habitat for several of the featured species using information about the characteristics of the habitats (resources) that animals are known to be associated with. The models include traditional knowledge-based habitat suitability models, resource selection functions based on GPS collar data, and Bayesian resource selection functions based on both traditional knowledge and GPS collar data. The source of information used for each model is in the map caption. The models estimate the relative habitat quality or the probability that an animal will use different Yukon North Slope ecosystem types, often broken down by season or purpose (such as for feeding or nesting). Areas with higher relative quality or higher probability of use are shown on the maps as having higher value for that species.

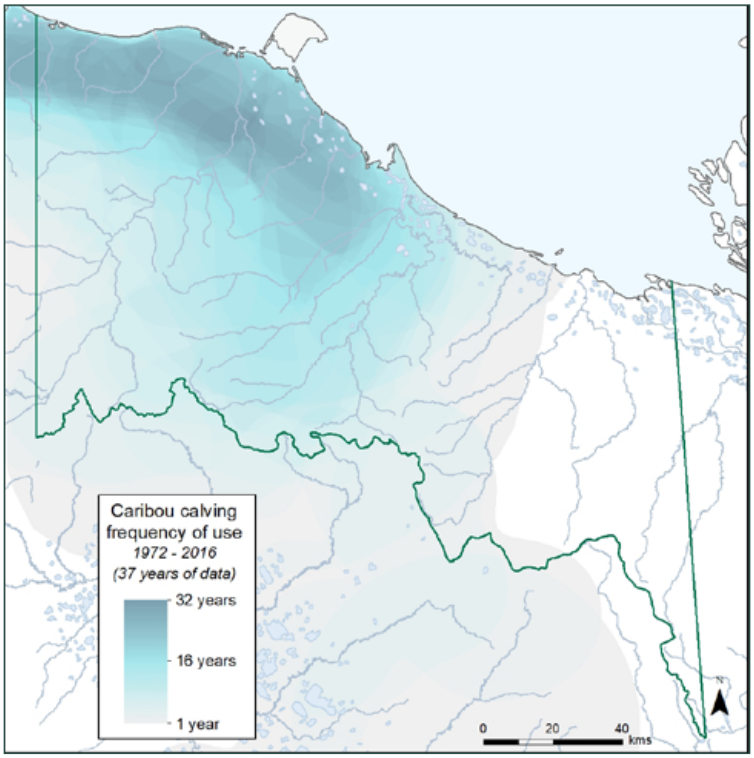


Tuttu/Caribou

The Porcupine Caribou Herd, one of the world's largest migratory barren ground caribou herds, ranges over 250,000 square kilometres of land straddling northeastern Alaska, northern Yukon, and the northwestern edge of the Northwest Territories. Important habitats for caribou/Tuttu on the Yukon North Slope include calving grounds (Map 10), post-calving areas, and summer habitats (Map 11).

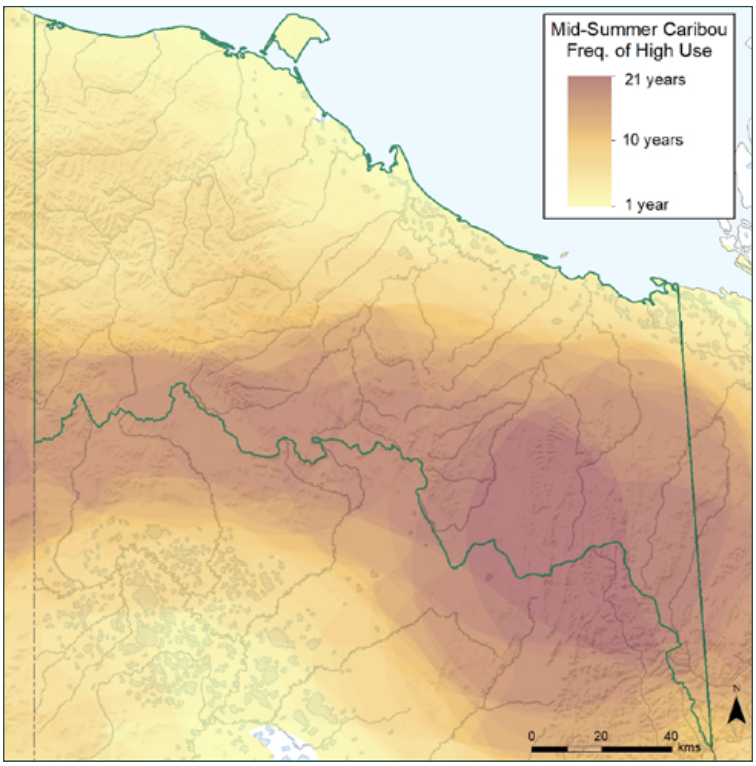
Caribou may also be found in all other seasons on the Yukon North Slope. Analyses of migration pathways used by the herd between 1995 and 2018 show the importance of the Yukon North Slope to the herd.

Map 10. Caribou calving locations on the Yukon North Slope, based on 37 years of data on calving locations of collared caribou



The map, based on 37 years of data spanning 1972 to 2016, shows how frequently caribou calve in different areas of the Yukon North Slope. Calving was mapped using collared caribou locations between May 26 and June 10 each year and the calving period seasonal range was estimated using a kernel estimator. From this, overlapping polygons were enumerated to describe the relative frequency of use. (Data source: Environment Yukon, in preparation)

Map 11. Caribou midsummer locations, based on 20 years of data on summer locations of collared caribou



The map is based on overlaying the annual seasonal ranges of caribou from July 16 to August 7 for 20 years of collar data spanning the period 1990 to 2016. The map shows how often caribou use an area during the mid-summer season, with use ranging from every year to once every several years. This map highlights that there are areas that are very important for caribou in all or most years, but also that there is variability from year to year in use of some areas. This indicates that caribou need flexibility in habitat availability. Caribou cows with their calves arrive on the Eastern North Slope every year around July 16 and remain in the area until early September in most years. (Data source: Environment Yukon, in preparation)

Inuvialuit land users from Aklavik mapped and described their knowledge of seasonal caribou habitats on the Yukon North Slope (Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC (NS) and Aklavik HTC, 2018a, pp. 14–24). The following account of seasonal use is drawn from this source of traditional knowledge, augmented with information from Western science research and monitoring studies.

In spring caribou migrate from winter ranges located south of the Yukon North Slope to the Yukon North Slope, making use of the coastal plains and, when necessary, the foothills, to calve. During the spring migration, caribou use a range of ecosystem types, including tundra, low flatlands and hillsides.

> Well, in the springtime, the cows like to be in the flats … most of the time the bulls always come last … [They] follow the cows.

> They always seem to be on a hillside … always seem to be … [at] the top of the hill … 'cause [they] can see predators coming, I guess.

Calving is in late May and early June. When calving occurs on the Yukon North Slope, the caribou generally remain close to their calving sites until later in June when they begin to move into Alaska for the post-calving period. Calving habitat is flat, open country close to the coast, where caribou can avoid predators and feed on sedges and lichens. Some people have observed changes in calving locations, with caribou calving further east or further inland, especially within the past 10 years. This may be because traditional calving areas in Alaska through the 2000s were generally more covered in snow than in previous decades.

> It's all [tundra], you know, there's a lot of good eating there, I guess … they're away from the mosquitoes [when they're] along the coast there.

> A lot of the times, these past 10, 15 years, it's been a hell of a lot warmer, earlier, you know? More land, more grasses and that exposed.

Calving is considered the most sensitive period in the herd's ecology. Although the Porcupine Caribou Herd is known to use the same region annually, the exact locations chosen by caribou for calving each year will vary to meet their needs, based on the specific conditions they encounter on the coastal plain. This means that caribou require access to all areas identified as calving habitats. Failure to provide this access could result in declines to calf survival of up to 20%, greatly increase the probability of an overall decline in the size of the herd, and reduce its ability to grow in the future.

In the **post-calving period**, caribou seek relief from biting insects by aggregating into large, cohesive groups and travelling together to find adequate food. They use habitats along the coast or on ridges.

During this time, caribou are producing their richest milk for calves. They generally run down their energy reserves as they compete with the tens of thousands of other caribou surrounding them for food while being harassed by mosquitoes. As a result, post-calving is also considered an extremely sensitive period.

> … when they [caribou] come by the coast, I'm pretty sure they're staying away from the bugs … We used to walk up here to look around and … as soon as we get [out of the] wind … that's when the bugs start … That's why I think they're down here [on the coast] because they're staying away from the … bugs.

> … they [caribou] hang out there [on snow patches] 'cause it's hot and, you know, it's warming up, June, July, and the mosquitoes are coming out … they go to the snow … 'cause it's cool and the mosquitoes won't bother [them] as much.

To date, most post-calving activities have occurred west of the Yukon North Slope, in Alaska, although portions of the herd's post-calving range extends into the Yukon in some years. Male caribou will also make use of mountainous areas in the southern edges of the Yukon North Slope or in the upper Blow River and Big Fish regions during this period. Although less sensitive to disturbance than the cow and calf portion of the herd during the post-calving period, bulls play an important role in the herd's biology, the ecology of the ecosystems they use. Bulls are also culturally and nutritionally important to communities, as they are primarily targeted by harvesters during most times of the year, making up generally over 60% of the total harvest.

In early summer to midsummer the caribou migrate from habitats on Alaska's North Slope, south through the high passes of the Brooks Range to the mountain range's south slope and the headwaters of major rivers like the Sheenjek and Colleen rivers. Once there, caribou turn east and migrate following the boundary between Ivvavik and Vuntut national parks, arriving on their summer ranges located around the Blow and Big Fish rivers. To the Inuvialuit the caribou have arrived in Aullaviat/Anguniarvik, where people and animals travel, a place for people to hunt. Some caribou may also move southeast along the coast, selecting open tundra and flatlands with a good supply of green vegetation and sea breezes that provide insect relief. People also observe caribou in summer on hillsides or in the mountains, seeking relief from insects and predators. Collar data collected for the herd supports these observations, showing that most of the herd is typically found in the interior of Aullaviat/Anguniarvik from mid-July through late August or into September (Map 11).

Caribou use many types of habitat in **late summer and early fall**, including tundra along the coast, hillsides, and, when snowstorms arrive, high mountain ridges. This period is critical for Porcupine Caribou Herd females who must gain mass prior to the fall rut in order to become pregnant. The late summer and early fall period is one of the few periods of the year where cow caribou have the capability of gaining mass.

> [Caribou are] right on top of the foothills … where it's flat … they're feeding all the time … 'cause this is an area where there's a lot of lichen; even on the rocky beach you can see the lichen.

At the end of the late summer and into the fall period, most caribou leave the Yukon North Slope and head towards winter ranges in the Yukon and Alaska, where they spread out.

> … Sometimes there will be west wind and they'll be on the west side, and sometimes it will be east wind and they'll be on the east side ….The wind always blows the snow off the top of the tundra … and they'll always be around … feeding around that area.

People have observed changes in migration patterns, such as caribou spending less time along the coast, particularly in the late summer, and changes in timing, depending on the weather. Migrations are becoming less predictable.

Porcupine caribou are the key ecosystem driver of the Yukon North Slope. Caribou modify and shape landforms and, through their droppings, fertilize vegetation that are an important source of nourishment to a wide variety of terrestrial and aquatic life.

The Porcupine Caribou Herd also plays a significant role that transcends its herd boundary. Porcupine caribou are considered a barren ground caribou, an ecotype of caribou that have been assessed as Threatened by the Committee on the Status of Endangered Wildlife in Canada based on widespread declines of barren ground caribou. The Porcupine Caribou Herd was one of only two herds (out of 14 to 15 herds) that were increasing at the time of the assessment (2016) and made up approximately a quarter of the total population of barren ground caribou in Canada. This demonstrates the importance of this herd to barren ground caribou as a whole in Canada.

Conservation Requirements

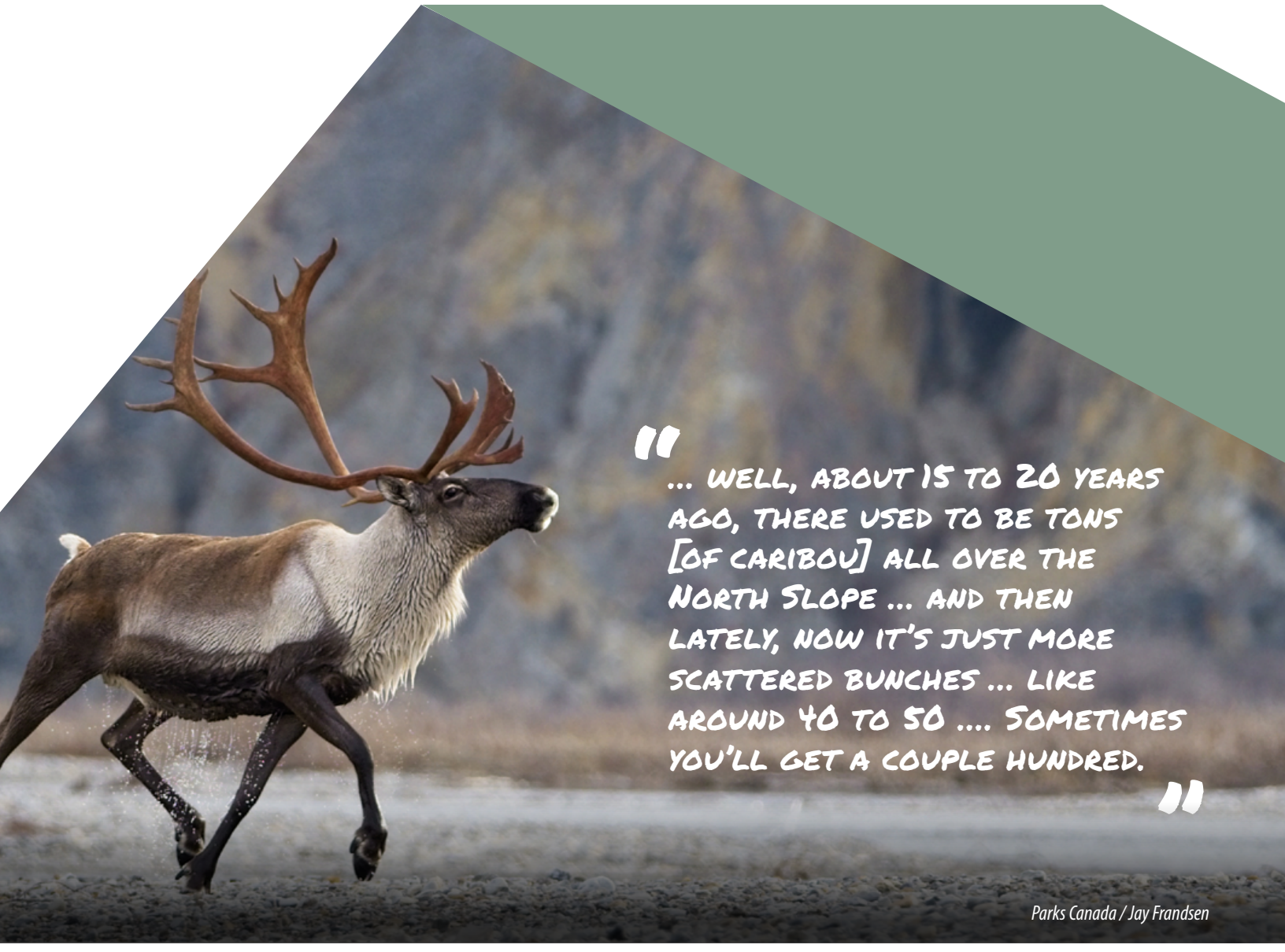
1) **Protection of the entire caribou calving and post-calving grounds and summer habitat on the Yukon North Slope.** This protection is needed to meet the needs of the caribou and of Inuvialuit harvesters. While the caribou make more use of some areas than others, their selection of calving and post-calving grounds varies from year to year. They need to have options open to them so that they can select the habitat that is most suitable each year. Most harvesting occurs at the periphery of the core caribou use areas (see Objective C), indicating that management should strive to keep caribou well distributed across the Yukon North Slope and not constricted to merely the areas of highest seasonal use.

2) **Protection of core summer habitats and migratory routes frequently used by the herd and conservation of those which are currently used less frequently but may become important in the future.** As climate change progresses it is likely that seasonal caribou habitat will change.



3) **Conservation of caribou habitats across the Porcupine Caribou Herd's range, especially of calving grounds in the Arctic National Wildlife Refuge, through collaboration among jurisdictions and parties, and by actively supporting research, monitoring, management, and mitigation of development impacts to meet the ecological requirements of the herd.**

4) **Research and monitoring of habitat condition and quality with an emphasis on the calving and mid- to late-summer periods.** It is anticipated that, with climate change, increased greening will occur along most of the Yukon North Slope, primarily as a result of shrubification. This may be beneficial to caribou initially but negative effects may follow if shrubs become too dominant in the region.



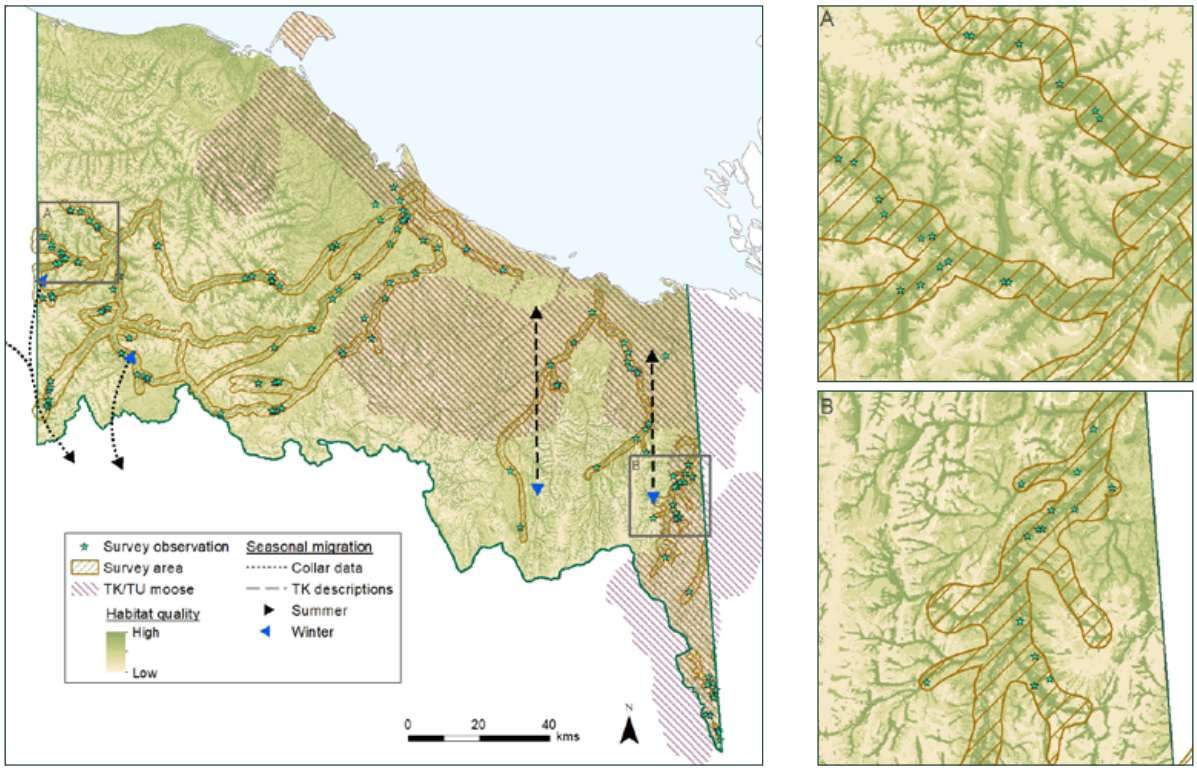
Parks Canada / Jay Frandsen

Tuttuvak/Moose

Moose/Tuttuvak have lived in the Mackenzie Delta for a long time, but they are relative newcomers to the Yukon North Slope. They probably started migrating to the coastal region to feed in the summer within the last hundred years.

Moose are now widespread on the Yukon North Slope, both inland and along the coastal plain (Map 12). Conservation of the wetlands and riparian areas that are preferred by moose benefits other wildlife, including fish and waterbirds.

Map 12. Moose habitat quality, mapped from a traditional knowledge-based habitat model, and observations of moose locations from surveys and interviews with Inuvialuit experts



This map shows 1) distribution of suitable habitat over the whole Yukon North Slope, with darker green being higher quality moose habitat, based on a habitat model; 2) observations of moose from aerial surveys and the areas that were surveyed; 3) general areas where Inuvialuit report seeing or harvesting moose; and 4) seasonal migration patterns based on locations of collared moose (in the west) and on traditional knowledge and older collar data (in the east).

The habitat quality ratings show where ecological conditions should be good for moose. The observations show the best information about where the moose are, which depends in part on what areas people frequent in their travels and hunting trips and what areas have been surveyed. This relationship can be seen in the magnified sections of the map (A and B).

Habitat quality ratings are from a habitat model based on Inuvialuit traditional knowledge and traditional use information from interviews with Inuvialuit experts (Round River Conservation Studies, 2019; WMAC [NS] & Aklavik HTC, 2018a, 2018b); survey data from Environment Yukon and Parks Canada.

Inuvialuit describe moose as always being in places with willows nearby and always in or close to water. They are usually spotted in low-lying or flat terrain. In the mountains, they are seen at the bottoms of hillsides or in river valleys.

> [Moose] always seem to be close to the water, because they seem to be feeding in the lakes. I've seen them … feeding in the lakes all the time. … I think they're eating grass roots.

> In wintertime, they tend to go … farther inland. You see more draws and more willows growing. … They come inland a bit and are close to the rivers.

> Most of the time when they're in the hills, they always bunch up together. … We never really saw that much long ago. … 2006, I think, I started seeing those bunches.
>
> *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC [NS] and Aklavik HTC, 2018a, pp. 27-30)*

Some moose move regularly between summer habitats and winter habitats. Data from collared moose shows that moose migrate from the Old Crow Flats to mountainous terrain in southwest Ivvavik National Park for the rut period and winter. Research in the late 1980s and early 1990s found a similar situation, with moose in Aullaviat/Anguniarvik migrating to major south slope rivers like the Bell, Little Bell, and Fish Creek. Inuvialuit knowledge confirms that migrations continue to happen in this area on an annual basis. Inuvialuit observe moose in coastal areas in the summer and in higher elevation terrain in winter. The general pathways between these seasonal habitats are shown on Map 12.

Conservation Requirements

1) **Conservation of coastal wetlands, river valleys, riparian areas, and areas with high winter use.** The habitat requirements for moose centre on swamps, lakes, rivers and streams. Habitat favoured by moose in the winter includes areas of southwestern Ivvavik National Park with mountainous terrain and steep-sided valleys.
2) **Ongoing monitoring of moose density and distribution and habitat in relation to climate change.** In recent decades, the warming climate has increased plant productivity and expanded shrub cover on the Yukon North Slope and in neighbouring Alaska. More of the land is covered in willows and the average height of the bushes has increased, providing food for moose and allowing densities to increase. Changes in moose density may cause major changes in food webs (such as an increase in wolves). Moose are also becoming more common in winter along the coastal plain, based on traditional knowledge. These trends may continue or there may be other changes in moose habitat. For example, more winter snow may cause moose to leave some areas, and hotter summers may dry up some swamps on the coastal plain.

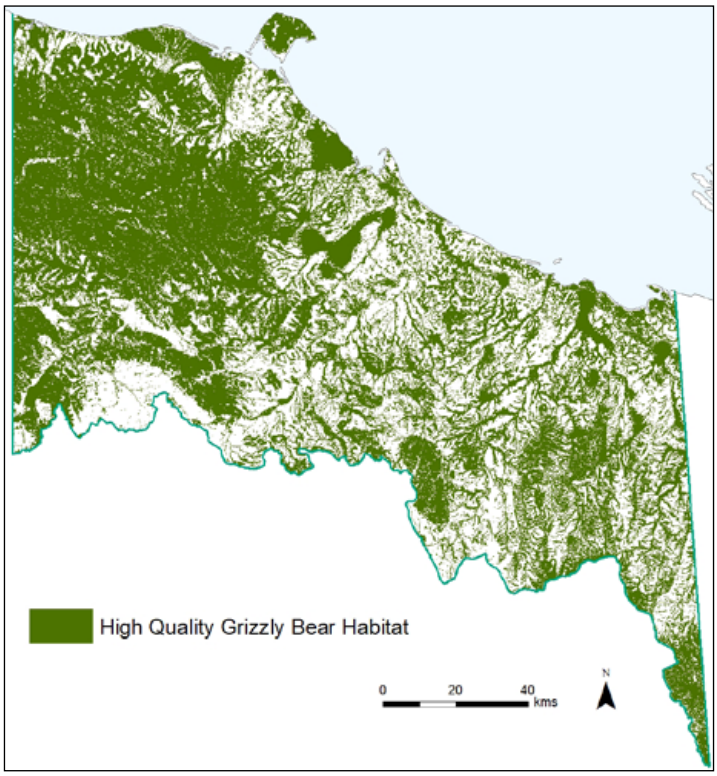
3) **Identification of specific migration corridors and conservation of these corridors to ensure moose can meet annual needs.** Migration is critical to northern populations of moose. It is likely that several mountain passes allow moose to pass between critical winter range and summer range on and beyond the Yukon North Slope. Ensuring that these migration corridors remain functional and that moose populations remain viable requires identifying the locations of the corridors and the timing and potential magnitude of their use, together with enacting policies for their protection as needed.



Parks Canada / Jay Frandsen

Akłaq/Grizzly Bear

Map 13. Grizzly bear habitat overview: moderate and high value habitats, mapped from habitat models based on traditional knowledge, locations of collared bears, and den surveys



This map shows habitat that is rated as moderate and high value, combining results from seven habitat models. Models for male and female grizzly bears were developed for spring, summer and fall seasons, and a single (males and females combined) denning habitat model was developed. The models combined traditional knowledge and GPS collar data, as well as survey observations for the denning period.

The suite of models shows that grizzly bears require a diversity of habitats throughout the year. Within each season there are specific important habitats that bears use a lot, but these habitats may be different between male and female grizzly bears. Both traditional knowledge and the GPS collar data indicate that grizzly bears require vast landscapes to meet their life needs. Collared female and male bears had average annual home range sizes of 585 km^2 and 3368 km^2 respectively. (Triska & Heinemeyer, 2020)

Traditional knowledge holders emphasize that grizzly bears/Akłaq are always on the move and feed on plants and animals in many habitat types. In early spring the bears emerge from their dens and immediately start digging for roots and hunting ground squirrels on hillsides. Throughout the springtime, grizzlies are moving down the river valleys to the rolling hills and flat tundra near the coast. They follow caribou, hunting them and scavenging wolf kills, and increasingly they are seen near muskox. Grizzlies also scavenge whale carcasses and hunt seals out on the ice. In the fall, grizzlies eat berries and follow the Dolly Varden as they migrate up the rivers. Dens are usually on south-facing hillsides, though some are in flatter, lower lands. Slumping along hillsides, a consequence of climate change, is affecting some denning areas. (Summarized from Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope; quotes below are from the same source (WMAC [NS] and Aklavik HTC, 2018a, pp. 30–34).

> Up here, the grizzly bear basically roams. You know, it doesn't have its own area … he's always constantly moving. … You might see him over here and … you know, couple of weeks later he'll be way off track somewhere else.

> Most of the time, in the springtime, you see them going down into the bigger creeks, bigger rivers that [are] running out.

> [I] see them out on the ice. … You see them following the cracks, like the polar bears do, much long ago.

> They're following the caribou … June, July … in August …You wonder where they've gone and then figure it out … they're way over on [the] side with the caribou. You know, along the beach and over into Alaska.

> In the early fall time, you still have the cranberries that are just finally ripe, you know. They'll be eating those, they'll be eating some of the blueberries that are still starting to grow, and roots.

> Where that fish hole is, there will … probably be bear in the fall time.

Recent research on the Yukon North Slope shows that while some grizzly bears may move large distances over the course of a year, most stay within their own home ranges, feeding mostly on vegetation but also on caribou and other large animals when they are available. This behaviour indicates that the bears have a strong reliance on food sources within their home ranges, including plants and small mammals.

Grizzly bears need large tracts of undisturbed land, as they use different food sources over the seasons. On the Yukon North Slope, grizzly bears select habitats that are diverse, with a variety of terrain features such as north-facing and south-facing slopes supporting a mix of vegetation types. Based on the habitat model results, grizzly bear habitat selection varies through the emergence period, with bears using mountain areas near

rivers and also venturing into the foothills and to the coast. Male and female grizzly bears appear to select for similar types of habitats in most periods, except summer, when males use rivers, beaches and timber vegetation in the foothills and females are often in more mountainous areas. The model for the denning period suggests that bears on the Yukon North Slope avoid areas in the flatlands and prefer to den in areas with high slopes and southern aspects.

Grizzly bears on the Yukon North Slope appear not to give birth until they are nine years old, which is older than in some other populations. While adult bears appear to have very high survival rates relative to other populations, survival of cubs is markedly low. As a result, the survival of adult females is more important for population stability of Yukon North Slope grizzly bears than for most grizzly bear populations, making management of mortality of adult females important.

The Canadian western population of grizzly bear is designated as Special Concern under the Species at Risk Act due to naturally low reproductive rates and increasing pressures from resource extraction and cumulative impacts. Yukon North Slope grizzly bears have limited to no exposure to these pressures and likely are one of the few remaining grizzly bear populations, even in the North, that are naturally regulated and at carrying capacity (meaning the population size is around the highest that the ecosystems can support).

Conservation Requirements

1) **Conservation of multiple ecosystem types grizzly bears depend on, with unimpeded passage for bears throughout the Yukon North Slope.** The extraordinarily wide range of foods favoured by grizzlies over the seasons is distributed through all Yukon North Slope ecosystem types, from mountains to tundra to the ocean. Conserving grizzly bears requires an ecosystem approach, to maintain the food webs and predator–prey dynamics of which grizzlies are an integral part. Seasonally important foods for grizzlies include various grasses and tundra plants, horsetails, roots, berries, insects, small mammals, ungulates, fish and sea mammals. Although this general requirement by the species is necessary for its continued persistence, we specifically recommend that sloped habitats at lower elevations near rivers be conserved.
2) **Identification and protection of denning sites from disturbance. Where ongoing or proposed activities are in areas with dens or denning habitat, den sites should be identified and avoided, particularly through winter until early June.**
3) **Non-harvest mortality kept to a minimum.** Non-harvest-related mortality is a significant cause of declines of grizzly bears in other parts of their range and is a key reason for listing western Canadian grizzly bears as a species at risk. Ongoing or proposed activities or developments with the potential to lead to non-harvest mortality should be carefully scrutinized, and measures put in place to minimize this risk. Non-harvest mortality, when considered with legal harvest, should be managed to maintain an acceptable mortality rate for the Yukon North Slope grizzly bear population.

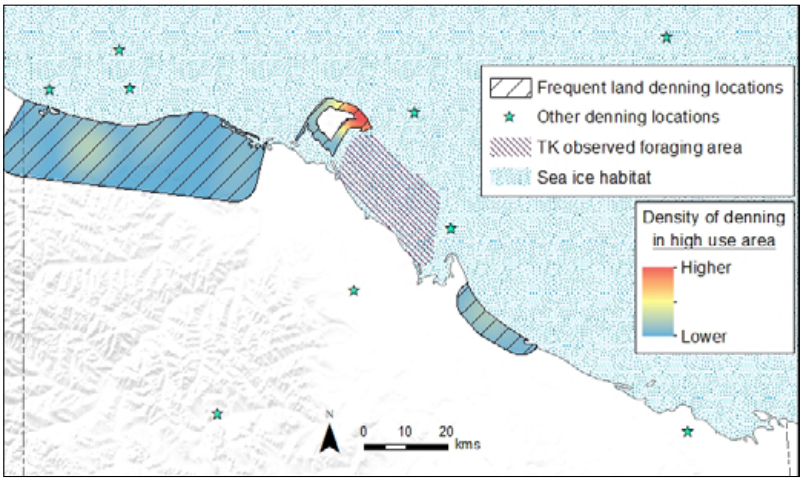
Nanuq/Polar Bears

Polar bears/Nanuq hunt from sea ice in areas with abundant, accessible seals. Through much of the year the sea ice is breaking up, shifting or refreezing. Polar bears search out the best conditions for travelling and hunting – usually on ice over shallow water and often associated with the shear zone (the area where pack and land-fast ice meet). Most of the marine area shown in blue on Map 14 is suitable habitat for polar bears, depending on the season and ice conditions.

Denning habitat includes snowbanks on the sea ice or on land near the coast, and, further inland, in ravines and small valleys where drifted snow allows for den creation (Map 14). Females enter dens to give birth in early winter and remain in their dens for three to four months before returning to the sea ice. The nursing mother may leave the den if she is disturbed, reducing the chance that her cubs will survive.

Polar bear distribution on the Yukon North Slope is related to the seasonal distribution of sea ice. The bears are generally closer to shore along the western half of the region – as far east as about King Point. They move further offshore as the ice recedes over the summer.

Map 14. Polar bear den sites and an area important to polar bears and Inuvialuit, based on surveys of den sites and interviews with Inuvialuit experts



Map sources: Durner, Fischbach, Amstrup & Douglas, 2010, Environment Yukon and Parks Canada, unpublished traditional knowledge data

> It [a polar bear den] was on a huge snowbank, on the east [side of Herschel Island] … snow accumulates on the east side of … this big valley that it was in … And the den itself was in the snow, which was … two, three feet in diameter and it went down like six feet straight … and you see all these claw marks … on the entrance of the polar bear den.

> They [polar bears] will hunt seals close to shore because there's cracks that happen in those areas and so the seals will go there for breathing holes.

> Most times, you often run into them [polar bears] … from Kay Point all along … to … the [Alaska] border.
>
> *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC [NS] and Aklavik HTC, 2018a, pp. 36-38).*

Polar bears are designated as Special Concern under Canada's *Species at Risk Act*, a status that was confirmed in 2018. The reason for the designation is the ongoing and predicted further reduction in seasonal coverage of sea ice across the Canadian range of polar bears, making access to seals, their main prey, increasingly difficult. The degree to which changes in sea ice are currently affecting polar bear population levels varies around the Arctic. Although Inuvialuit consider polar bear populations in the region to be healthy, it is anticipated that habitat change due to climate warming may pose a significant threat to the Southern Beaufort subpopulation. An additional threat is possible oil and gas development within the most significant land-based denning areas in Alaska (including the 1002 Area of the Arctic National Wildlife Refuge). Habitat on the Yukon North Slope may become more critical for this population as denning moves onshore because of the loss of sea ice due to climate change, especially if on-land denning areas in Alaska are reduced. Land-based denning has become more common for Southern Beaufort Sea polar bears since the 1980s. This shift is associated with sea ice loss.

Conservation Requirements

1) **Protection of denning areas from disturbance, and summer refugia if or when they are identified.** Currently denning is known to occur along portions of the coastal plain of Ivvavik National Park, throughout Herschel Island, and along the shoreline between Kay and King points. It is anticipated that polar bears will make greater use of lands on the Yukon North Slope in the future. Up-to-date information from monitoring and Inuvialuit observations on denning habitat types and locations is needed on an ongoing basis, due to rapidly changing conditions. The specific locations used by polar bears for denning and during summer should be incorporated into this recommendation as they become known.

2) **Conservation of nearshore habitats critical to polar bears.** Polar bears make extensive use of the nearshore Yukon North Slope and in particular areas adjacent to Herschel Island. During the 2010s, the shear zone (the area between landfast and pack ice) has moved closer to shore. Management of activities in this region (such as marine transport or harbour development), during ice-on periods is required, to ensure impacts to polar bears are limited.

3) **Cooperative, adaptive management of the Southern Beaufort Sea polar bear subpopulation across jurisdictions.** Effective management will incorporate the best available research, monitoring, and Inuvialuit knowledge about changing sea ice and coastal habitat conditions, population size and demographics, and polar bear health.



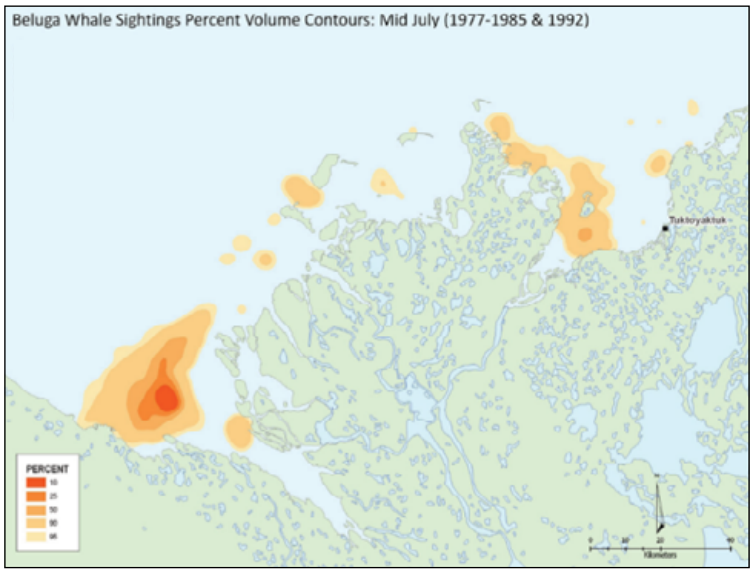
Parks Canada / Jay Frandsen

Whales and Seals

Nearshore and offshore Yukon North Slope marine areas provide habitats for four marine mammals. Areas of high use depend on the season and ice conditions. Beluga whales/Qilalugaq return from wintering in the Bering Sea to the southeastern Beaufort Sea and Amundsen Gulf each summer.

Bowhead whales/Arviq of the Bering-Chukchi-Beaufort population also winter in the Bering Sea. They use coastal waters of the Yukon North Slope and other areas of the Canadian Beaufort and Amundsen Gulf from spring to fall for feeding and travelling. Many linger along highly productive shelf waters, especially in the late summer, to feed in areas with abundant plankton. Good feeding areas shift with ocean conditions. Ringed seals/Natchiq are widespread along the coast. They gather to feed on fish in late summer and fall in the Yukon North Slope region of Niaqunnaq. Bearded seals/Ugruk are also present, but they are less abundant.

Map 15. Beluga whale sightings in mid-July over 10 years (1977 to 1985 and 1992), based on surveys



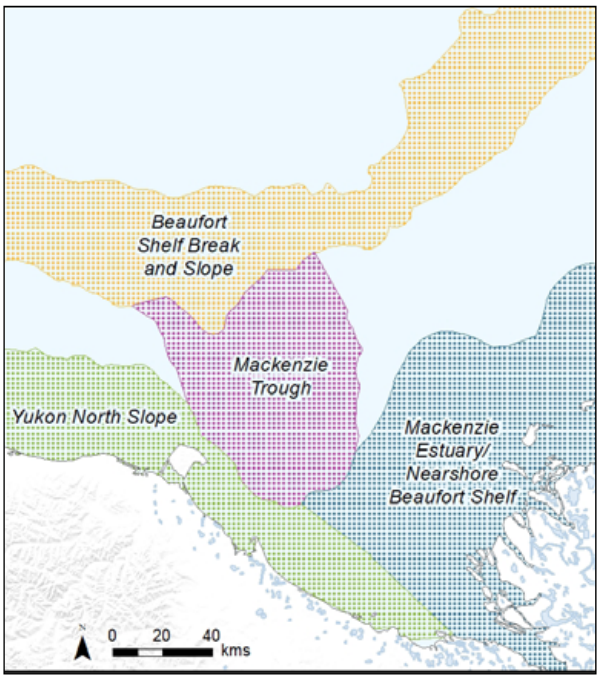
Beluga congregate in Niaqunnaq (Shallow Bay) in summer. The warm, turbid waters in the bay are favourable for newborn calves and for predator avoidance; beluga also moult in this area. Niaqunnaq is one of three marine areas that make up the Tarium Niryutait Marine Protected Area, which was established in 2010 to protect beluga whales and other marine species. The map shows the distribution of all beluga sightings during aerial surveys (Harwood, Iacozza, Auld, Norton & Loseto, 2014).

Nearshore and offshore marine areas of the Yukon North Slope are designated as ecologically and biologically significant areas (EBSAs) within the Beaufort Sea Large Ocean Management Area (Map 16).

Significant whale and seal habitat values identified for these EBSAs include:

- Beluga seasonal aggregations and calving in Niaqunnaq, as shown in Map 15, which is of high significance for the Eastern Beaufort Sea beluga population
- Migratory corridors for beluga, bowhead whales, and juvenile ringed seals
- Foraging habitat for beluga, bowhead whales, and ringed seals in nearshore and offshore waters
- Areas important for ringed seal breeding, especially in the Yukon North Slope EBSA

Map 16. Ecologically and biologically significant areas for marine species in the Yukon North Slope near and offshore



(DFO, 2014b)

The Bering-Chukchi-Beaufort bowhead whale population is designated as Special Concern through Canada's *Species at Risk Act* because of uncertainty about how bowhead whales will respond to rapid changes in habitat due to climate change and increasing Arctic shipping and industrial activity. The Eastern Beaufort Sea beluga population and the two seal species are not considered at risk but face challenges as they depend on habitats and food sources that are strongly linked to sea ice.

Conservation Requirements

1) **Minimize harmful effects of any industrial and shipping activity on whales and seals.** Potential threats to habitat include water or noise pollution, excessive disturbance to animals, damage to benthic habitat, and damage from spills or other accidents.

2) **Consideration of effects of climate change in whale and seal population management and habitat conservation decisions.** The effects of climate change on sea ice and on the functioning of Beaufort Sea marine ecosystems are major considerations in all aspects of planning and management for conservation of whales and seals. Areas occupied seasonally by the whales and seals depend on where the ice is. Ocean conditions such as warming temperatures, changes in ice cover, and acidification affect the locations and abundance of food sources: plankton for bowhead whales and fish, especially Arctic cod, for belugas and seals.



Government of Yukon / Cameron Eckert

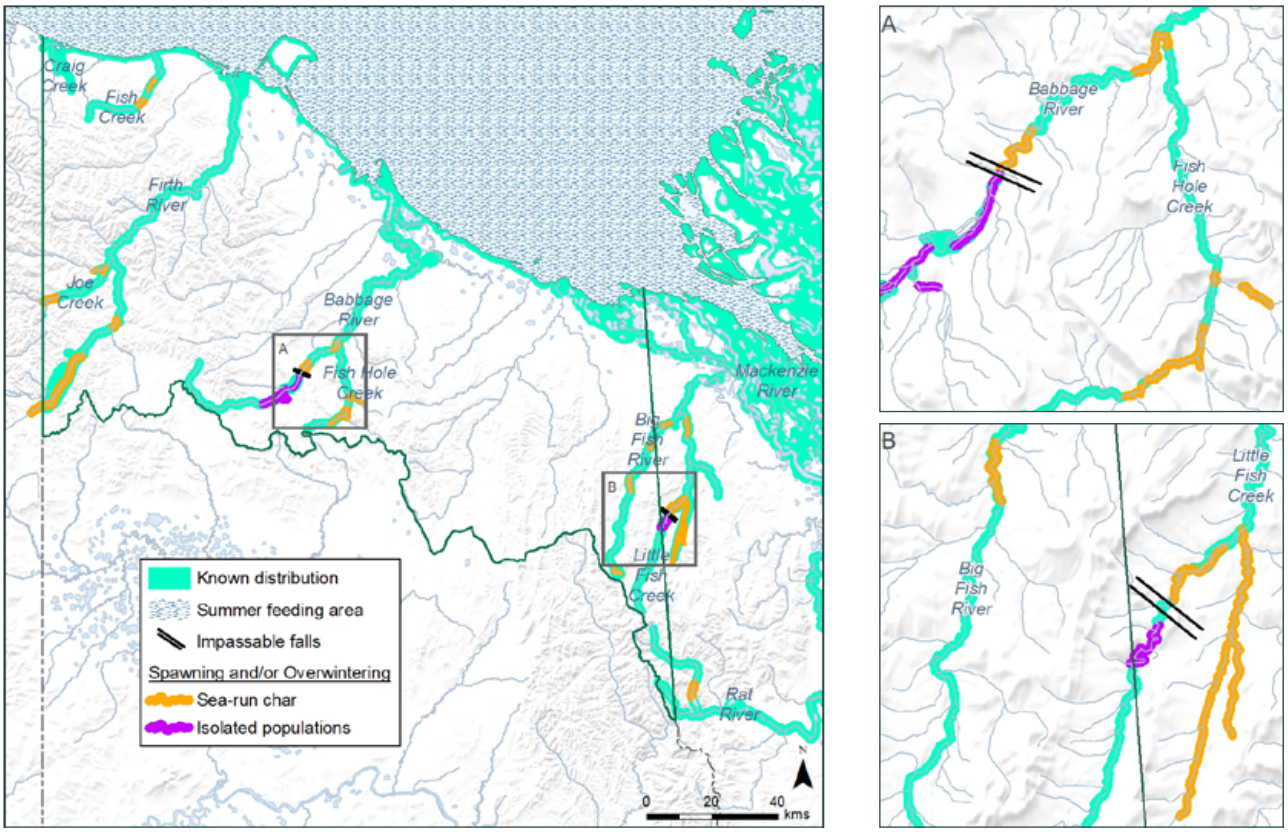
Iqaluqpik/Dolly Varden

Dolly Varden/Iqaluqpik (known locally as char) overwinter and spawn in spring-fed sections of mountain streams at the headwaters of rivers (Map 17). The warm spring water prevents the stream from freezing to the bottom. Some stream sections remain ice-free all winter. Some ice-free areas where many fish gather are called fish holes. Main fish holes are in tributaries east of the Babbage River and in the Firth River and Joe Creek near the Alaskan border. The Big Fish River fish hole is just downstream of the Yukon/NWT border. The Rat River fish hole is also in the NWT close to the Yukon border.

Most Dolly Varden spend the summer feeding in marine waters, though some remain in rivers, including isolated populations upstream of impassable waterfalls on the Big Fish and Babbage rivers.

Dolly Varden are in most major rivers of the Yukon North Slope. Inuvialuit traditional knowledge indicates that the Malcolm River supported Dolly Varden in the past, but recent surveys have not found Dolly Varden in this river.

Map 17. Dolly Varden habitat: known distribution, overwintering and spawning locations, and summer marine feeding zone, based on surveys and Inuvialuit traditional knowledge



The map is based on surveys and Inuvialuit traditional knowledge. (Dave Tavares, personal communication, April 2019; Ellen Lea, personal communication, March 2019; WMAC [NS] and Aklavik HTC, 2018b; Sawatzky and Reist, 2014).

> The erosion on the hills … make the creek shallow. … Probably harder [for Dolly Varden] to get up to where they're supposed to spawn.

> Probably about ten years [ago] was a really thick [sea] ice … and it was really good fishing. … You could see the char coming, you could see their little ripples … along the edge of the water. … That's what the normal used to be back then.
>
> *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC [NS] and Aklavik HTC 2018a, p. 42).*

Canadian Western Arctic populations of Dolly Varden, which are only on the western side of the Mackenzie River, are managed under the Dolly Varden Integrated Fisheries Management Plan (2019–2023). The species was designated as Special Concern under the *Species at Risk Act* in 2017 because Inuvialuit and Gwich'in knowledge identified declines in fish numbers in the Big Fish and Rat rivers and because the limited supply of spring-fed overwintering and spawning habitat makes Dolly Varden particularly vulnerable. This habitat type is rare – for example, it makes up less than 5% of the Babbage River system downstream of the falls. The total known winter habitat for Western Arctic Dolly Varden in Canada is 0.63 km^2, of which half is within the Yukon North Slope.

Conservation Requirements

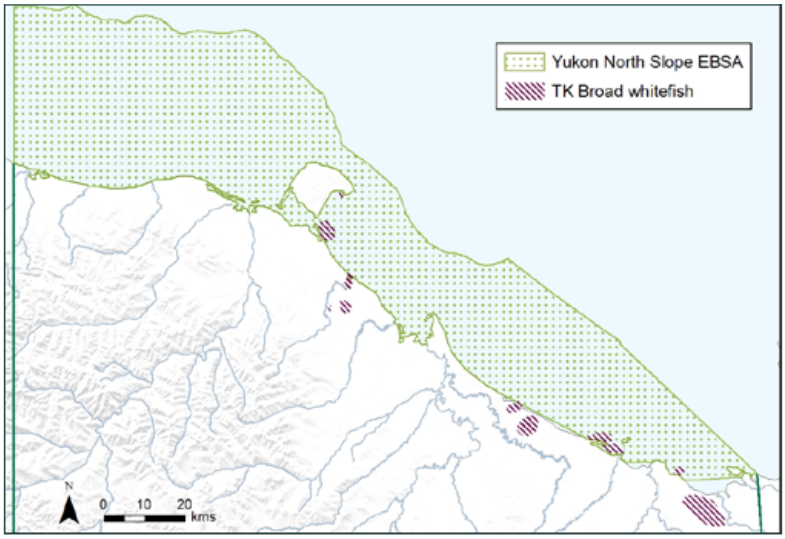
1) **Minimize disturbance to spring-fed spawning and overwintering sites and ensure access to these spots by Dolly Varden is not impaired by human activity.** Dolly Varden are also vulnerable to effects of climate change including changes to groundwater and surface water flows, and permafrost thawing and slumping around fish holes.
2) **Conservation of productive summer feeding conditions along the coast.** Good feeding is in clear waters near the ice edge. With coastal waters being siltier at times and with summer sea ice being further offshore, the marine areas char frequent for feeding are changing. Dolly Varden have been further offshore and less available to Shingle Point fishers in recent years.
3) **Track hydrological and fish passage changes to key spawning and overwintering rivers associated with new or increased beaver infrastructure.** Rivers on the Yukon North Slope are likely to become more favourable for beaver habitat over time, with increased shrubification.

Aanahqlik/Broad Whitefish

Broad whitefish/Aana are abundant in the Mackenzie Delta area, overwintering in tributaries and side channels. Broad whitefish avoid salty marine waters. They are present in relatively small numbers in fresh and brackish water along the Yukon North Slope coast, including in bays with a freshwater surface layer, such as Roland Bay (Map 18). Inuvialuit fishers have observed an increase in broad whitefish in marine waters in recent years.

Lakes near to the sea provide feeding habitat for broad whitefish, but there is only sparse documentation about lake habitat use along the Yukon North Slope coast.

Map 18. Marine and coastal lake habitats of broad whitefish, based on surveys in marine waters and Inuvialuit traditional knowledge of whitefish locations



Yukon North Slope ecologically and biologically significant area (EBSA) and Aklavik traditional knowledge of broad whitefish. Data sources: (DFO, 2014b; WMAC [NS] & Aklavik HTC, 2018a)

> We noticed that … [there are] more and more … freshwater fish in the sea.

> Well, whitefish never used to be at Shingle Point long ago, when I was a little girl … Now the fish from the Delta are starting to come into that area … Because our water is not as salty as before.

> Only time they [broad whitefish] come out [to the ocean] is when there's a big wind and the tide comes up … And this [water] overflows and they come out.
>
> *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC [NS] and Aklavik HTC, 2018a, p. 43)*

Broad whitefish coastal habitat needs are representative of habitat that is also important to other species of anadromous fishes. A corridor of fresh to brackish water extending from the shore to water depths of about 10 metres runs along the Yukon North Slope from the Mackenzie Delta to Alaska. This continuous body of nutrient-rich, relatively warm water close to the coastline is used for feeding and migration by anadromous fishes, including broad whitefish, Arctic cisco, least cisco, coney (inconnu), and Dolly Varden. This migration route maintains the complex connections between river, lake and marine habitats used seasonally and over the lifetimes of these fish species. The freshwater corridor and the upwelling that enhances its nutrient contents are attributes recognized in the designation of the Yukon North Slope EBSA and the Tarium Niryutait Marine Protected Area.

Conservation Requirements

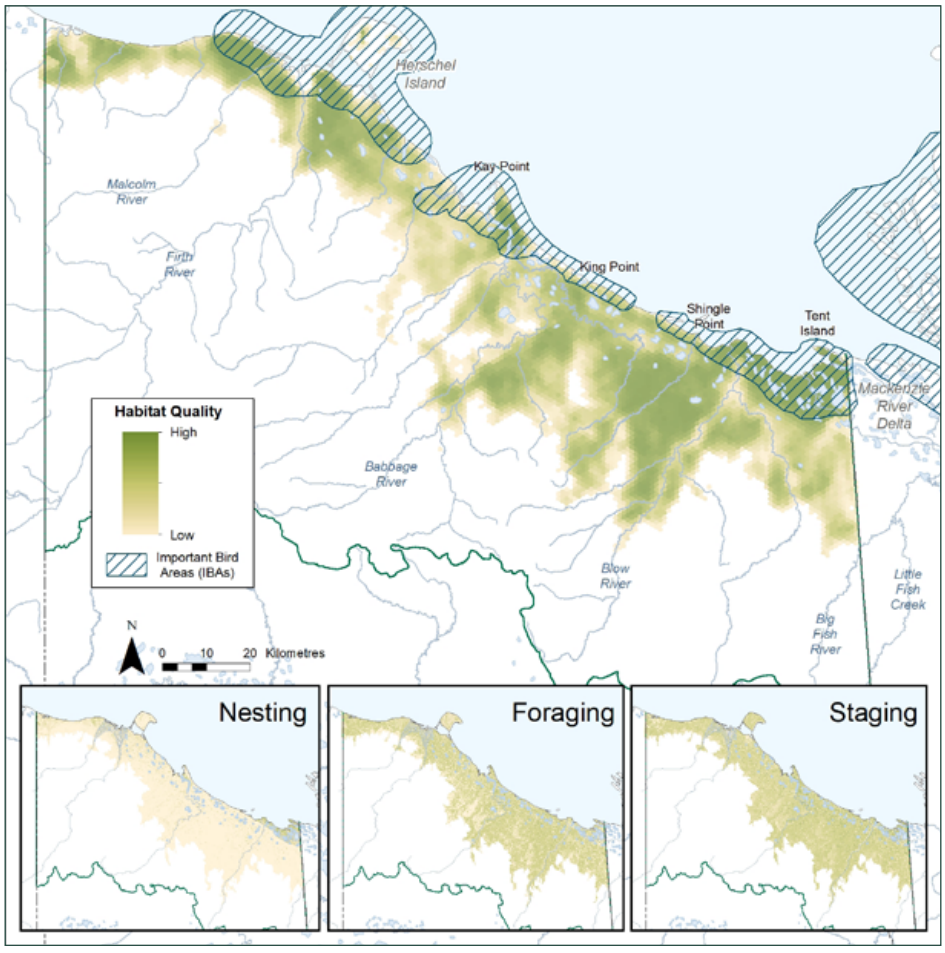
1) **Conservation of the nearshore band of brackish water along the Yukon North Slope coastline and in bays with a freshwater surface layer.**
2) **Conservation of lakes and creeks along the coastal plain.**

Geese

The Yukon North Slope is a stopover, or staging, area for geese, especially in the fall when geese are fattening up after breeding, in preparation for migrating south. Snow geese feed on berries along inland hillsides and on grasses and sedges in coastal wetlands. Brant feed in salt marshes on the seaward side of deltas. Yellowlegs feed along the coast in ponds and wetlands. Yellowlegs, Canada geese, brant, and some snow geese nest along the coast. Most snow geese leave in the spring for nesting grounds to the east and north. The names for geese in the Inuvialuktun UUummarmiutun dialect are: snow goose (lesser snow goose)/Kanuq; brant (black brant)/Niggilingaak; yellowlegs (greater white-fronted goose)/Nigglik; Canada goose/Uluagullik.

Map 19 shows land and wetland (swamp) areas with suitable nesting, foraging, and staging habitat for geese. Important Bird Areas (IBAs) are also shown. The three IBAs are areas with habitat that is recognized as important for geese. The IBAs include coastal lands and extend into tidal flats, bays, and coastal waters.

Map 19. Goose habitat: suitable habitat for nesting, foraging and staging, mapped from a traditional knowledge-based habitat model



The map is created from a habitat model based on Inuvialuit traditional knowledge. Data sources: (IBA Canada, n.d.; WMAC [NS] & Aklavik HTC, 2018a)

> They usually bunch up … thousands and thousands of geese … every spring and fall. They pull the roots up from [the marsh] and then they have lunch.

> We know they're eating berries in late fall … They always come from the ocean and they're always heading to the foothills.
>
> *Inuvialuit Traditional Knowledge of Wildlife Habitat, Yukon North Slope (WMAC [NS] and Aklavik HTC, 2018a)*

Goose habitat on the Yukon North Slope is broadly representative of coastal habitat needs for ducks, swans and shorebirds. Three IBAs are designated under international criteria because many thousands of waterfowl and shorebirds congregate there in the fall. Birds that gather in these areas of the Yukon North Slope include significant proportions of the global populations of Western Arctic lesser snow geese, black brant, and some shorebird species.

The Western Arctic population of lesser snow geese is estimated to be 1.3 million, a significant increase from the estimated 300,000 birds in the 1970s (CWS, 2020). Since snow geese forage by pulling out the roots of grasses and sedges, they can damage or destroy habitat for other species. This happens especially in high-use or high-density areas such as those near breeding colonies. For example, near Churchill, Manitoba, preferred shrub habitat for nesting savanah sparrows declined by 84% in areas damaged by lesser snow goose foraging (Peterson et al, 2014). Because of its increasing population, the Western Arctic population of lesser snow geese was designated as overabundant in 2014, due to the potential for severe damage to Arctic and Subarctic vegetation and the other species that depend on the same habitat (CWS, 2020).

Conservation Requirements

1) **Conservation of large areas across the Yukon North Slope coast, especially tidal flats and deltas, to allow for variability in habitat use and space for habitat recovery.** Patterns of habitat use change over the years and from year to year as the geese adapt to changing conditions. Snow geese pull out the roots of grasses and sedges, and it takes more than a year for the vegetation to recover. For this reason, they need a greater area and broader distribution of habitat than is used in any given year.
2) **Management and monitoring of overabundant species to ensure long-term habitat health for geese and other species**. Since snow geese vary their use of the North Slope from year to year, the impacts of their grazing on the coastal environment and other species should be monitored. Traditional knowledge and on-the-land monitoring by locals will be key to determining how geese are affecting their habitat or other species by overgrazing. If necessary, action to address adverse impacts from overabundant species may need to be taken.
3) **Avoidance, mitigation and management of significant impacts to geese from marine industrial development and associated infrastructure, and from increased ship traffic and aerial disturbance**. Potential impacts include loss of habitat, disturbance, and damage to habitat and harm to geese from spills. When assessing potential effects of marine development, current and projected effects of climate change on goose habitat must also be considered. Climate change effects include accelerated coastal erosion that may lead to loss of nesting sites and reduction of staging and foraging habitat.



Parks Canada / Jay Frandsen

Furbearers

Furbearers are a diverse wildlife group with habitat needs that range over many terrain types present on the Yukon North Slope, including sea ice, coastal plains, valleys, hillsides and mountains.

The predator species are not abundant, as is characteristic of Arctic ecosystems, but they are all widely distributed, a good indicator of the integrity of the Yukon North Slope ecosystems.

Table 18. Furbearers on the Yukon North Slope

Arctic fox (white fox)/Tigiganiak	Not in the Delta. In the winter they travel out on ocean ice, following polar bears out along open leads and eating scraps. Delays in fall freeze-up of sea ice may be a problem. Seen on and near Herschel Island all summer.
Red fox (coloured fox; silver fox; cross fox)/Kayuqtuq	In the Delta and widespread on the Yukon North Slope, but not seen frequently. They travel a lot. People see dens on mounds beside river channels and see foxes in summer inland in river valleys and on Herschel Island.
Snowshoe hare (varying hare, rabbit)/Ukalliq	Widespread, in flats and creeks with willows. In bad weather they go under the snowbank. Always quite abundant inland, especially in Firth River area, but not on Herschel Island.
Wolf/Amaguk	Around, but do not see too many. Where they are depends on where the caribou and moose are. Bigger packs west of the Babbage River, where they are not hunted as hard.
Wolverine/Qavvik	Travel in the foothills and mountains and are rarely seen on the coast or Delta. In the spring, see burrows at the tops of valleys where the snow builds up. They go out on the ice also.

Based on the report Aklavik Inuvialuit Describe the Status of Certain Birds and Animals on the Yukon North Slope (WMAC [NS] & Aklavik HTC, 2003)

> Throughout the travel, you're going to be coming across tracks. You're looking at them and you're going to see wolf tracks. You're going to see wolverine tracks. You go out on the tundra … all you're going to see is tracks a lot of times.

> What I noticed when we were heading to Herschel Island, the wolves and wolverines always head out to the ocean for hunting seal pups. In April, the wolves and wolverines always head out to the ocean.

Yukon North Slope Inuvialuit Traditional Use Study (WMAC [NS] and Aklavik HTC, 2018b, p. 72)

Wolverine, the only furbearer considered at risk in Canada, was designated as a species of special concern under the *Species at Risk Act* in 2018, based on increasing habitat fragmentation and effects of climate change on snowpack in the southern and eastern parts of its range. Habitat in the Yukon North Slope and adjoining areas, with low habitat fragmentation and adequate snowpack, is likely to become increasingly important for the species if its range continues to contract in other areas.

The widespread effects of climate change on Yukon North Slope ecosystems, especially the increase in shrub growth, can be expected to affect furbearers through direct changes to their habitat and through effects on the animals that the carnivorous furbearers prey on. Examples:

- Outside of the April to July denning period **wolves** follow the Porcupine caribou annual migrations, roaming widely across the herd's range. Higher densities of moose and other prey animals, including muskox, on the Yukon North Slope and surrounding lands may lead to wolves becoming more resident on the Yukon North Slope.
- **Red foxes** have expanded northward over the past 100 years and can compete with **Arctic foxes** for denning sites and for the small rodents that they both prey on. Red foxes have displaced Arctic foxes in some regions of the circumpolar Arctic. The two species appear to exist together on the Yukon North Slope, with no major changes since the 1970s, based on den surveys. This balance is likely related to limited food supplies and could change if the abundance of small rodents changes.
- **Wolverine** mainly den in snow drifts that persist into spring, and so are vulnerable to changes in spring warming and snowpack.
- The increase in shrub growth along rivers and creeks provides more favourable **beaver** habitat. Observations indicate that beavers may be occupying new areas or becoming more common on the Yukon North Slope. Beavers have expanded their range on the Alaskan tundra. Beavers can have a significant effect on ecosystems, as their dams and ponds change stream courses, thaw permafrost, and alter habitats for other aquatic species.

Conservation Requirements

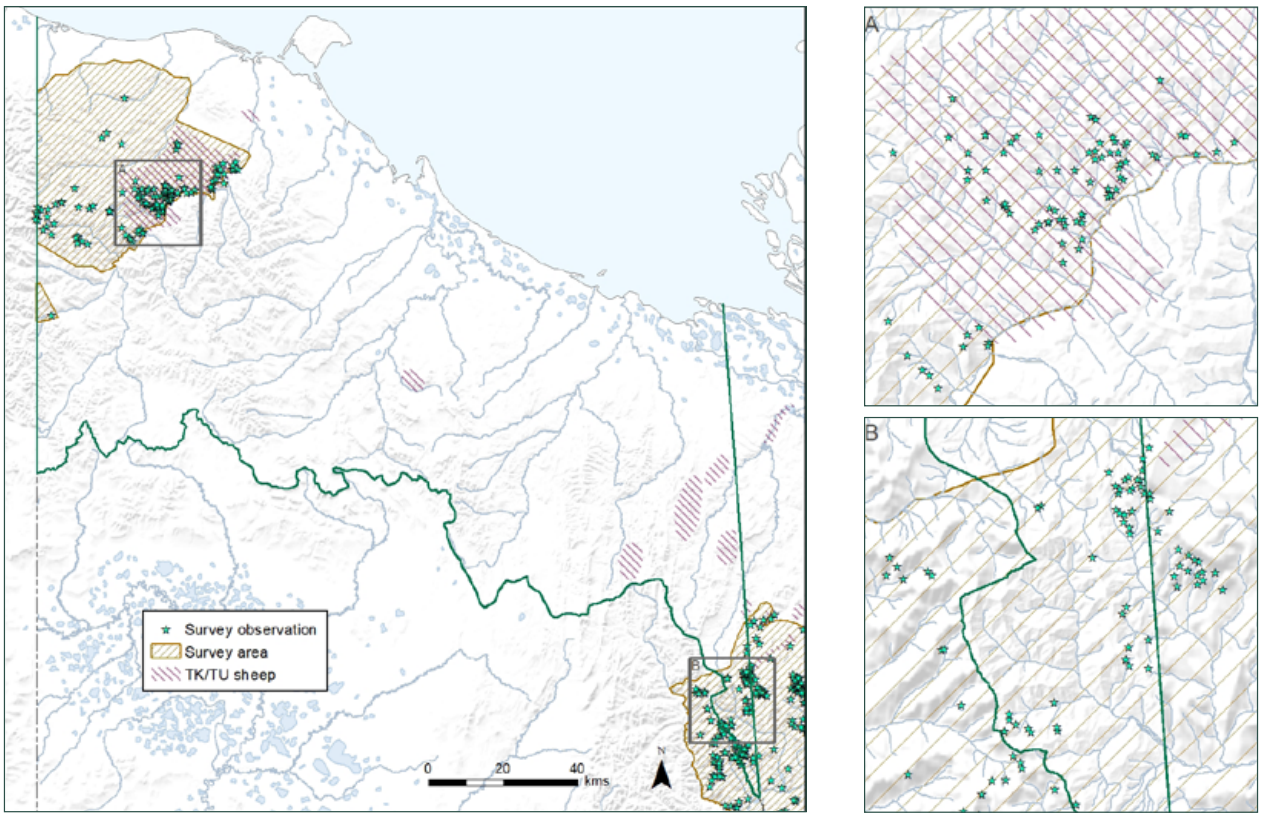
1) **Conservation of large tracts of diverse ecosystem types with ample prey.**
2) **Protection of denning areas for wolves**. Suitable denning habitat is restricted for wolves, and may limit their populations. In some areas of the Arctic dens have been used for centuries or longer.
3) **Research and monitoring of distribution and seasonal movements of furbearers in relation to changing climate and changing ecosystems**. Warmer weather, changes in rain and snow, and effects of climate change such as the increase in shrub growth may be leading to changes in habitats and food availability for several furbearers.

Imnaiq/Dall's Sheep

Dall's Sheep/Imnaiq live in the British mountains west of the Firth River and in the northern Richardson Mountains in the southeast of the Yukon North Slope (Map 20). They are spotted by Inuvialuit along rocky ridges in summer and fall when people are hunting and travelling through these mountainous areas. The west side of the Firth River valley is important sheep habitat throughout the year and sheep are often in the river canyon.

Sheep are in rugged, wind-blown mountainous areas in winter. These areas have less snow, making it easier to access food. In summer they may be in the mountains or on slopes and valleys, close to mineral licks. They select areas near or on cliffs at lambing time. Rugged terrain and cliffs allow sheep to escape from predators. Tors (rocky knobs on tops of hills), a landscape feature west of the Firth River, provide escape terrain in high alpine grazing areas. Sheep generally return to the same winter, lambing, and summer areas year after year.

Map 20. Dall's sheep: observations of their locations and areas that they frequent, based on surveys and Inuvialuit traditional knowledge



The map is compiled from surveys in Ivvavik National Park and in the northern Richardson Mountains, and Inuvialuit observations of areas where sheep are seen or hunted. Data sources: observations by Inuvialuit (WMAC [NS] and Aklavik HTC, 2018a) and survey data (Environment Yukon and Parks Canada).

> Mostly the sheep would be in the high mountains – less snow – and [in] the springtime they would be heading down to the valley where there would be all the green grass. That's where they find the food, up in the high hills, but in the summertime where we are staying in the coastline because [of] the fresh tundra. Down the coastline it's all low ground so they [move down] more than on hills so it would be easy for them.
>
> *Inuvialuit Settlement Region Traditional Knowledge Report (ICC et al., 2006, pp. 11–67)*

Conservation Requirements

1) **Conservation of key habitat types and locations** used by Dall's sheep, including mineral licks, lambing cliffs, and winter ranges.
2) **Management of disturbance so that human activities do not reduce the ability of the range to support sheep, while recognizing harvest rights and ecotourism potential.** Sheep are easily disturbed by aircraft flights (particularly rotary wing aircraft) and by humans close by on the ground, although they can become habituated to human presence.
3) **Monitoring of sheep populations and habitat use so that management measures that protect important sheep areas and habitat types can be adapted to the effects of climate change.** The warming climate will likely enhance sheep productivity, but this is complicated by other potential climate-related effects, such as changes in the snowpack, changes in predation, and the spread of diseases and parasites. The recent northward spread of *Mycoplasma ovipneumoniae* (M. ovi), a bacterium that can lead to respiratory disease in sheep, is an emerging issue that may become a management concern. M. ovi was detected in Alaskan Dall's sheep in 2018.

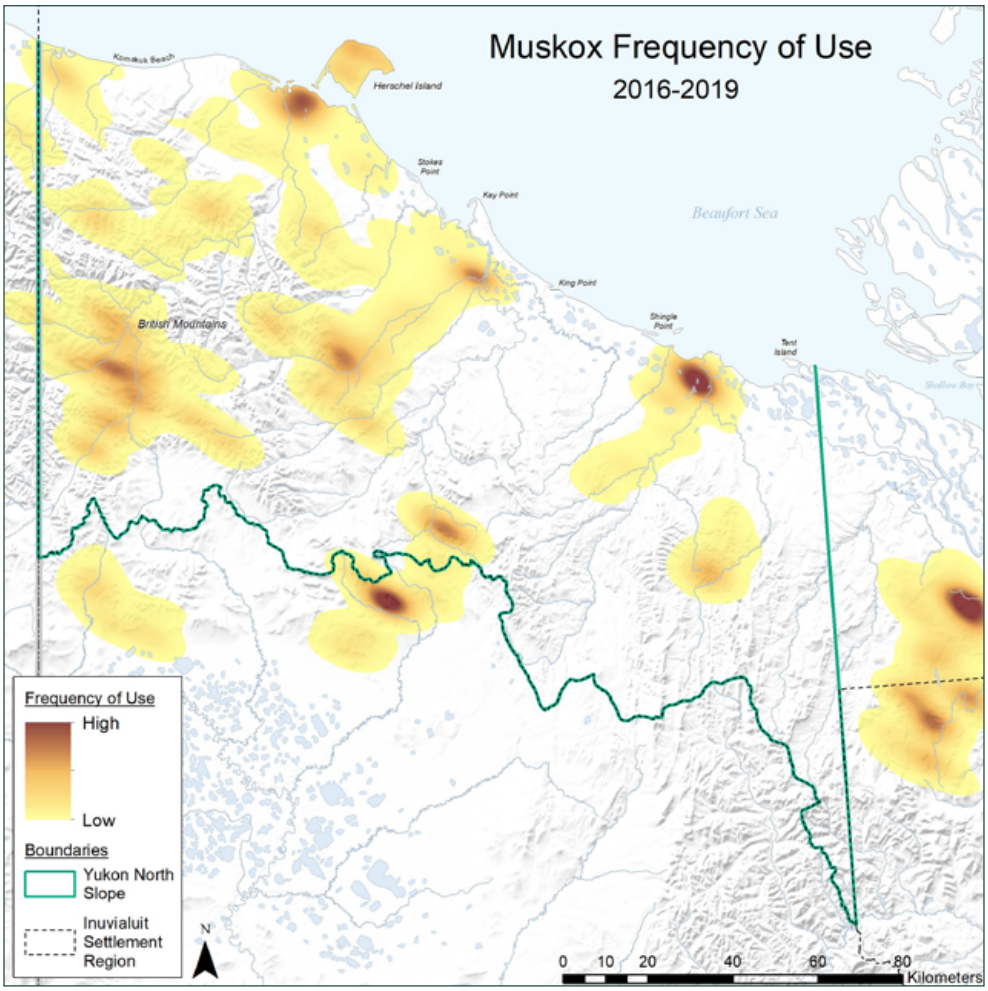


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Umingmak/Muskox

Muskox/Umingmak are widely distributed on the Yukon North Slope (Map 21). They also make use of some adjacent areas (such as Vuntut National Park and the northern Richardson Mountains). In summer they feed in a range of habitats, preferring moist vegetation types. Sedges are an important food. In the fall they also spread into shrubbier areas to feed on willows. In winter they favour hillsides and ridges that have strong winds to blow away the snow.

Map 21. Muskox distribution shown as frequency of use by 24 collared muskox monitored 2016 to 2019



The map compiles observations by Inuvialuit (WMAC [NS] & Aklavik HTC, 2018a) and survey data (Environment Yukon and Parks Canada).

Muskox used to live on the Yukon and Alaskan coastal plains but declined and disappeared during the 19th century, prior to the arrival of Europeans. Their disappearance was likely due to a combination of hunting and changes in weather, such as a period of greater snow depths. A small group of muskox from Greenland was introduced in 1969 and 1970 to Barter Island and the Arctic National Wildlife Refuge in Alaska. This population slowly increased and extended its range before undergoing a decline and becoming extirpated from the Refuge. Muskox have likely been increasing in recent years but still remain below the maximum population size reached in the late 1990s.

Groups of muskox began to be seen on the Yukon North Slope in the mid-1980s and they are now found east to the Mackenzie River and south into Vuntut National Park. Despite this range expansion, the population remains small: in 2018 the Canadian part of the range was home to about 350 muskox. Grizzly bear predation, health-related issues, and relatively poor productivity, rather than a shortage of good habitat, likely keeps muskox numbers low.

Muskox management has focused on population monitoring, managing harvest opportunities, and addressing questions about whether muskox have negative effects on caribou. The concern is partly about whether caribou avoid muskox, but also about the potential for competition between the two species for food and habitat and whether muskox damage vegetation that is important for caribou.

These concerns are being investigated through research and monitoring with community involvement, as set out in the Yukon North Slope and Richardson Mountains Muskox Research Plan (WMAC [NS], 2019).

Globally, muskox have seen dramatic declines in recent years and, although relatively small in size, the North Slope population has and will likely continue to play an important role in conserving the species globally.

Conservation Requirements

1) **Conservation of a diverse landscape of lowlands and hills with moist vegetation, from sedge swamps to windblown ridges.** Muskox use different areas seasonally and depending on weather conditions.
2) **Investigation of potential interactions in seasonal habitat use by muskox and caribou to evaluate effects of the reintroduced muskox population on caribou.**
3) **Research and monitoring to help understand the status and vulnerability of this small muskox population.** Muskox population declines have been linked to health issues caused by diseases and parasites, and muskox are prone to die-offs from extreme weather events. Populations in other Arctic regions have declined recently. An improved understanding of pressures on this population will aid in managing the population to maintain its viability.

Species at Risk

Some of the Featured Species in this Plan have been assessed by COSEWIC and listed under the federal *Species at Risk Act* (SARA). There are also a number of species not considered in depth in this Plan that have been listed under SARA (Table 18). Addressing all Yukon North Slope species is outside the scope of this Plan. It is also beyond current financial and human capacity to monitor and manage the full suite of wildlife that calls the Yukon North Slope home. However, it is expected that the conservation requirements for featured species, and the recommended enhanced area-based conservation framework, will contribute to broad conservation of the diversity and abundance of wildlife populations and habitats on the Yukon North Slope. In the future, should recovery plans require the identification of critical habitat or other recovery tools, these can, subject to review and consultation, be integrated into the conservation framework of the Yukon North Slope.

Table 19. By designatable unit, species on the Yukon North Slope that have been assessed by COSEWIC and the corresponding SARA listing and recovery documents, if applicable

Species (SARA designatable unit)	COSEWIC / SARA Schedule 1 (listing) Status	Recovery Document (if available)
Caribou (barren ground populations)	Assessed by COSEWIC as Threatened (2016); under consideration for listing	n/a – species is not legally listed
Grizzly bear (Western population)	Assessed by COSEWIC as Special Concern (2012); listed as Special Concern (2018)	SARA Management Plan under development
Polar bear	Assessed by COSEWIC as Special Concern (2008, 2018); listed as Special Concern (2011)	SARA Management Plan under development
Dolly Varden (Western Arctic populations)	Assessed by COSEWIC as Special Concern (2010); listed as Special Concern (2017)	SARA Management Plan under development
Beluga (Eastern Beaufort population)	Assessed by COSEWIC as Not at risk (2004)	n/a – species is not legally listed
Peregrine falcon *(Anatum tundrius population)*	Assessed by COSEWIC as Not at risk (2017); listed as Special Concern (2012)	Management Plan for the Peregrine Falcon anatum/tundrius (*Falco peregrinus anatum/tundrius*) in Canada (2017)
Buff-breasted sandpiper	Assessed by COSEWIC as Special Concern (2012); listed as Special Concern (2017)	SARA Management Plan under development
Wolverine	Assessed by COSEWIC as Special Concern (2014); listed as Special Concern (2018)	SARA Management Plan under development
Collared pika	Assessed by COSEWIC as Special Concern (2011); listed as Special Concern (2017)	SARA Management Plan under development
Red-necked phalarope	Assessed by COSEWIC as Special Concern (2014); listed as Special Concern (2019)	SARA Management Plan under development

Table 19. Continued

Species (SARA designatable unit)	COSEWIC / SARA Schedule 1 (listing) Status	Recovery Document (if available)
Hudsonian godwit	Assessed by COSEWIC as Threatened (2019); under consideration for listing	n/a – species is not legally listed
Lesser yellowlegs	Assessed by COSEWIC as Threatened (2020)	n/a – species is not legally listed
Horned grebe	Assessed by COSEWIC as Special Concern (2009); listed as Special Concern (2017)	SARA Management Plan under development
Bank swallow	Assessed by COSEWIC as Threatened (2013); listed as Threatened (2017)	SARA Management Plan under development
Short-eared owl	Assessed by COSEWIC as Threatened (2021); listed as Special Concern (2012)	Management Plan for the Short-eared Owl (Asio flammeus) in Canada (2018)
Transverse lady beetle	Assessed by COSEWIC as Special Concern (2016); under consideration for listing	n/a – species is not legally listed
Gypsy cuckoo bumble bee	Assessed by COSEWIC as Endangered (2014); listed as Endangered (2018)	SARA Management Plan under development
Grey whale	Assessed by COSEWIC as Special Concern (2017); under consideration for listing	n/a – species is not legally listed
Ringed seal	Assessed by COSEWIC as Special Concern (2019); under consideration for listing	n/a – species is not legally listed



Parks Canada / Jay Frandsen

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