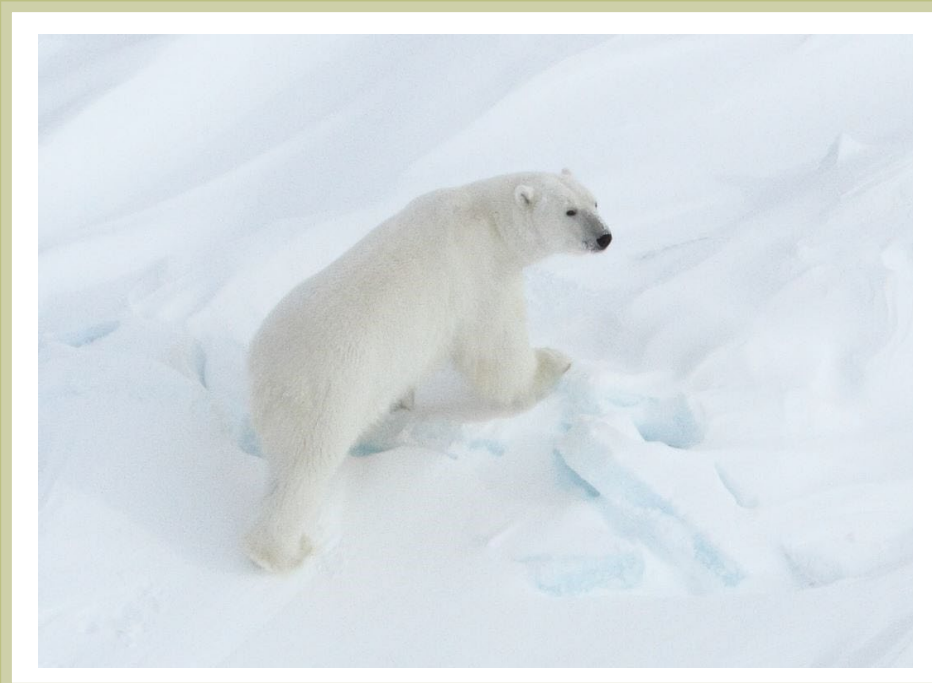


DRAFT

Species at Risk Act
Management Plan Series
Adopted under Section 69 of SARA

Management Plan for the Polar Bear (*Ursus maritimus*) in Canada

Polar Bear



2022

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For copies of the management plan, or for additional information on species at risk, including Committee on the Status of Endangered Wildlife in Canada (COSEWIC) Status Reports, residence descriptions, action plans, and other related recovery documents, please visit the [Species at Risk \(SAR\) Public Registry](#)¹.

Cover illustration: © David McGeachy (Environment and Climate Change Canada)

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¹ <https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry.html>

MANAGEMENT PLAN FOR THE POLAR BEAR

(Ursus maritimus) IN CANADA

2022

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

In the spirit of cooperation of the Accord, the relevant jurisdictions (Governments of Yukon, Northwest Territories, Nunavut, Ontario, and Québec), and the relevant Wildlife Management Boards (WMB), Advisory Councils and Indigenous governments within these jurisdictions, have given permission to the Government of Canada to adopt their management plans or recovery strategies for the Polar Bear (*Ursus maritimus*) (Parts 2, 3, 5 and 6) under Section 69 of the *Species at Risk Act* (SARA). Environment and Climate Change Canada has included a federal addition (Part 1) which completes the SARA requirements for this Management Plan. The Polar Bear Recovery Strategy and Management Plan which will be prepared by the Governments of Manitoba and Newfoundland and Labrador, respectively, will be adopted as Parts 4 and 7 of the National Polar Bear Management Plan once they are transmitted to Environment and Climate Change Canada.

The federal Management Plan for the Polar Bear (*Ursus maritimus*) in Canada consists of seven parts:

Part 1 – Canada:

Federal Addition to the Management Plan for the Polar Bear (*Ursus maritimus*) in Canada, prepared by Environment and Climate Change Canada

Part 2 – Inuvialuit Settlement Region:

Inuvialuit Settlement Region Polar Bear Joint Management Plan 2017, prepared by the Joint Secretariat Inuvialuit Settlement Region

Part 3 – Nunavut:

Nunavut Polar Bear Co-Management Plan, prepared by the Nunavut Polar Bear Co-Management Working Group

Part 4 – Manitoba:

Document will be inserted and adopted as Part 4 of the National Polar Bear Management Plan once transmitted to Environment and Climate Change Canada by Manitoba

Part 5 – Ontario:

Part A: Government Response Statement to the Recovery Strategy for Polar Bear, prepared by the Ontario Ministry of Natural Resources and Forestry (2016)(species-specific policy)

Part B: Recovery Strategy for Polar Bear (*Ursus maritimus*) in Ontario, prepared by M.B. Tonge and T.L. Pulfer (2011) (technical advice)

Part 6 – Québec-Eeyou Marine Region-Nunavik Marine Region:

Management Plan for the Polar Bear (*Ursus maritimus*) for Québec, the Eeyou Marine Region and the Nunavik Marine Region, prepared by the Québec - Eeyou Marine Region - Nunavik Marine Region Polar Bear Working Group

Part 7 – Newfoundland and Labrador:

Document will be inserted and adopted as Part 7 of the National Polar Bear Management Plan once transmitted to Environment and Climate Change Canada by Newfoundland and Labrador

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6 **PART 1: Federal addition to the Management Plan for the**
7 **Polar Bear (*Ursus maritimus*) in Canada, prepared by**
8 **Environment and Climate Change Canada**

Preface

The federal, provincial, and territorial government signatories under the [Accord for the Protection of Species at Risk \(1996\)](#)² agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Under the *Species at Risk Act* (S.C. 2002, c.29) (SARA), the federal competent ministers are responsible for the preparation of management plans for listed species of special concern and are required to report on progress within five years after the publication of the final document on the SAR Public Registry.

The Minister of Environment and Climate Change and Minister responsible for the Parks Canada Agency is the competent minister under SARA for the Polar Bear and has prepared the federal component of this management plan (Part 1), as per section 65 of SARA. SARA section 69 allows the Minister to adopt all or part of an existing plan for the species if the Minister is of the opinion that an existing plan relating to wildlife species includes adequate measures for the conservation of the species. The Governments of Yukon, Northwest Territories, Nunavut, Ontario, and Québec provided the attached management plans and recovery strategy for the Polar Bear (Parts 2, 3, 5, and 6). The Province of Ontario also led the development of the attached Government Response Statement (Part 5A), which is the Ontario Government's policy direction on Polar Bear. This policy summarizes the prioritized actions that the Ontario Government intends to take and support in response to the provincial recovery strategy. The Polar Bear Recovery Strategy for Manitoba and Management Plan for Newfoundland and Labrador will be adopted as Parts 4 and 7, respectively, of the National Polar Bear Management Plan once they are transmitted to Environment and Climate Change Canada. This Federal Addition to the National Polar Bear Management Plan consists of the adoption of the jurisdictional recovery documents for the entire Designatable Unit in Canada. To the extent possible, this Management Plan was prepared in cooperation with the relevant jurisdictions (Governments of Yukon, Northwest Territories, Nunavut, Ontario and Québec), Indigenous governments and organizations³, Wildlife Management Boards/Advisory Councils⁴, and other co-management partners within the range of Polar Bear in Canada as per section 66(1) of SARA.

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

² <http://registrelep-sararegistry.gc.ca/default.asp?lang=en&n=6B319869-1%20-%20202>

³ Makivik Corporation, Nunavut Tunngavik Inc., Cree Nation Government, Nunatsiavut Government, and the Inuvialuit Game Council

⁴ Wildlife Management Advisory Council (NWT) and Wildlife Management Advisory Council (North Slope), Nunavut Wildlife Management Board, Nunavik Marine Region Wildlife Board, Eeyou Marine Region Wildlife Board, Torngat Wildlife and Plants Co-Management Board

45 Implementation of this management plan is subject to appropriations, priorities, and budgetary
46 constraints of the participating jurisdictions and organizations.
47

ACKNOWLEDGEMENTS

Lauren Schmuck, Sam Iverson (Wildlife Management and Regulatory Affairs Division, Wildlife Management Directorate, Canadian Wildlife Service) and Véronique Brondex (Species at Risk Implementation Division, Wildlife Management Directorate, Canadian Wildlife Service) led the preparation of the Federal Addition (Part 1) to the National Polar Bear Management Plan. The contributions of Caroline Ladanowski, Ryan Zimmerling (Wildlife Management and Regulatory Affairs Division, Wildlife Management Directorate, Canadian Wildlife Service), Peter Hale (formerly Wildlife Management and Regulatory Affairs Division, Wildlife Management Directorate, Canadian Wildlife Service), Matthew Huntley (Species at Risk Implementation Division, Wildlife Management Directorate, Canadian Wildlife Service), Cecilia Lougheed (International Biodiversity Division, Biodiversity Policy and Partnerships Directorate, Canadian Wildlife Service), Gina Schalk (Species at Risk Implementation Division, Wildlife Management Directorate, Canadian Wildlife Service), Teresa Tufts (Northern Region, Regional Operations Directorate, Canadian Wildlife Service), Diana Ghikas (Prairie Region, Regional Operations Directorate, Canadian Wildlife Service), Ken Tuininga (Ontario Region, Regional Operations Directorate, Canadian Wildlife Service), Mark Mills (Québec Region, Regional Operations Directorate, Canadian Wildlife Service), Paul MacDonald (Atlantic Region, Regional Operations Directorate, Canadian Wildlife Service), Nick Lunn, Evan Richardson and Dominique Henri (Wildlife Research Division, Wildlife and Landscape Science Directorate, Science & Technology Branch), Joanne Tuckwell (Conservation Programs Branch, Protected Areas Establishment and Conservation Directorate, Parks Canada Agency), Scott Chiu (Aquatic Ecosystems, Biodiversity Management, Species at Risk Program, Fisheries and Oceans Canada), Karine Robert (Ecosystem Science, Fish Population Science, Ecosystems and Oceans Science, Fisheries and Oceans Canada), and the Marine Mammal Science Branch, Ecosystem and Ocean Sciences sector, Ecosystems Science Directorate of Fisheries and Oceans Canada are acknowledged and appreciated.

Environment and Climate Change Canada appreciates the input of the Wildlife Management Boards, Advisory Councils, and Inuit, Inuvialuit, Cree and First Nation individuals across the species' range. Environment and Climate Change Canada has, to the extent possible, attempted to integrate the Indigenous Knowledge shared by Inuit, Inuvialuit and Cree, alongside scientific knowledge, to develop this Management Plan.

Environment and Climate Change Canada would like to express its gratitude to the Working Group of organizations on the Polar Bear Administrative Committee (PBAC) for their guidance and input on the development of the first draft of the Federal Addition (Part 1) of the National Polar Bear Management Plan. In addition, gratitude is extended to the following Indigenous,

provincial, territorial and federal organizations for their insightful comments and collaboration throughout the development of this document:

- Inuvialuit Game Council
- Wildlife Management Advisory Council (North Slope)
- Government of Yukon
- Wildlife Management Advisory Council (Northwest Territories)
- Government of Northwest Territories
- Nunavut Wildlife Management Board
- Nunavut Tunngavik Incorporated
- Government of Nunavut
- Government of Manitoba
- Government of Ontario
- Makivik Corporation
- Nunavik Marine Region Wildlife Board
- Eeyou Marine Region Wildlife Board
- Gouvernement du Québec
- Torngat Wildlife, Plants and Fisheries Secretariat
- Nunatsiavut Government
- Government of Newfoundland and Labrador
- Parks Canada Agency

Lastly, the contributions of the citizens, non-governmental organizations, Indigenous organizations, scientists and various interest groups who provided guidance, comments and recommendations to improve this Management Plan during the consultation processes are acknowledged.

Additions and Modifications to the Adopted Documents

The following sections have been included to address specific requirements of the federal *Species at Risk Act* (SARA) that may not be addressed in the jurisdictional management plans or recovery strategies for the Polar Bear (*Ursus maritimus*) (Parts 2, 3, 5 and 6 of this document, referred to henceforth as “the jurisdictional management plans or recovery strategies”), and/or to provide updated or additional information. Parts 4 (Manitoba) and 7 (Newfoundland and Labrador) will be inserted and adopted into National Polar Bear Management Plan when they are transmitted to Environment and Climate Change Canada.

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

1. COSEWIC Species Assessment Information

Assessment Summary – November 2018⁵

Common name

Polar Bear

Scientific name

Ursus maritimus

Status

Special Concern

Reason for designation

This apex predator depends on the availability of sea ice from which to hunt its preferred prey—ice-adapted seals. Reduction in the area and period of sea ice coverage due to climate warming in the Canadian Arctic, with consequent reductions in feeding opportunity, is the primary threat to the persistence of this species. However, the magnitude of the impact on population numbers is uncertain and will vary across the range. Population levels and trends are currently uncertain, as population estimates undertaken since the last COSEWIC assessment in 2008 exist for less than half of the range and survey methodology has changed. This precludes the use of quantitative trend analysis for most of the Canadian population. The total

⁵ The November 2018 COSEWIC Species Assessment Information is taken directly from the 2018 In-Press COSEWIC Assessment and Status Report on the Polar Bear *Ursus maritimus* in Canada.

population in Canada likely exceeds 10,000 mature individuals. ATK indicates stable or increasing populations in all 13 management units, while scientific knowledge suggests a decline associated with poorer body condition, decreasing productivity, and sea ice decline in three management units in the southern part of the range. The Canadian population is predicted to decline over the next three generations (35 years) due to a reduction in seasonal coverage of sea ice. This species may become Threatened in the future because the effects of sea ice loss on this species will be extensive and ongoing.

Occurrence

Yukon, Northwest Territories, Nunavut, Manitoba, Ontario, Québec, Newfoundland and Labrador, Arctic Ocean.

Status history

Designated Not at Risk in April 1986. Status re-examined and designated Special Concern in April 1991. Status re-examined and confirmed in April 1999, November 2002, April 2008, and November 2018.

2. Species Status Information

It is estimated that approximately 60% of the global population of the Polar Bear is found in Canada (Wiig et al. 2015; Obbard et al. 2010). The International Union for the Conservation of Nature (IUCN) has ranked the Polar Bear as globally Vulnerable (A3c) due to the potential for large reductions in the global Polar Bear population if the losses in sea ice extent and quality measured over the last several decades continue as forecast (Wiig et al. 2015). International, national, provincial and territorial NatureServe rankings for the Polar Bear are captured in Table 1, below.

Table 1. List and description of NatureServe* rankings for the Polar Bear.

Region:	Status:
Global	G3 (Vulnerable)
Canada	N3
Yukon	S1
Northwest Territories	S2S3
Nunavut	S3
Manitoba	S2
Ontario	S3
Québec	S2
Newfoundland and Labrador	S2S3

* The NatureServe rankings for the Polar Bear are designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = Global, N = National, and S = Subnational). The numbers have the following meaning: 1 = critically imperiled, 2 = imperiled, 3 = vulnerable, 4 = apparently secure, 5 = secure.

In Canada, the Polar Bear was designated as a species of special concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) in 1991 and the special concern status was confirmed by COSEWIC in 1999, 2002, 2008 and 2018 (COSEWIC 2018). Polar Bear was listed as a species of special concern under the *Species at Risk Act* by the Government of Canada in 2011 (SOR/2011-23). The special concern listing does not impose automatic federal prohibitions – management of Polar Bears in Canada will continue as it was prior to the listing. A special concern listing does, however, trigger the development of a federal Management Plan, which plays an important role in preventing the Polar Bear from becoming a threatened or endangered species. A Management Plan lays out the actions that are required to prevent any further decline of the species. The federal, provincial, and territorial government signatories under the Accord for the Protection of Species at Risk (1996) agreed to establish complementary legislation and programs that provide for effective protection of species at risk throughout Canada. Table 2 provides a summary of provincial and territorial government designations for the Polar Bear.

Table 2. List and description of various conservation status designations for the Polar Bear in Canada.

Province/Territory	Legislation	Designation	Year
Yukon	<i>Yukon Wildlife Act</i>	No status	–
Northwest Territories	<i>Species at Risk (NWT) Act</i>	Special Concern	2014
Nunavut	<i>Nunavut Wildlife Act</i>	Not listed	-
Manitoba	<i>Endangered Species Act</i>	Threatened	2008
Ontario	<i>Endangered Species Act, 2007</i>	Threatened	2009
Québec	<i>Loi sur les espèces menacées ou vulnérables</i>	Vulnérable ⁶	2009
Newfoundland & Labrador	<i>Endangered Species Act</i>	Vulnerable ⁷	2002

The Polar Bear is listed within Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and has been listed since CITES came into effect in 1975. This means that any international shipment of Polar Bears or parts thereof requires an export permit from the country of origin (Government of Canada, 2017a). In Canada, CITES is implemented by the federal government through the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act* (WAPPRIITA). For more information on CITES and WAPPRIITA, please refer to section 6.

⁶ Equivalent to Special Concern under SARA

⁷ Equivalent to Special Concern under SARA

3. Species Information

3.1 Species Description

The Polar Bear is a large carnivorous mammal that inhabits both terrestrial and marine areas and occurs in Canada, Greenland, Norway (Svalbard), Russia, and the United States. Polar Bears are apex predators, and they occupy the highest trophic levels in arctic marine ecosystems (Thiemann et al. 2008). In the wild, female Polar Bears can live up to 30 years, and male Polar Bears can live up to 25 years (Cohen 2004). Females generally produce litters of one or two cubs at a time, though triplets are occasionally born (Ramsay and Stirling, 1988). In most areas, females care for cubs during the first two and a half years of their cubs' life, which means females are capable of mating once every three years (Stirling 2011).

While some genetic differences exist between Polar Bears found throughout Canada, COSEWIC concluded that these differences do not meet the criteria for dividing the Canadian Polar Bear population into multiple Designatable Units (DUs) (COSEWIC 2018). For management purposes, the global Polar Bear population is divided into 19 subpopulations, 14 of which occur in whole or in part in Canada (see Figure 1, below). These 14 subpopulations are considered to comprise the single DU in Canada (COSEWIC, 2018). Abundance inventories are conducted and status and trend is monitored at a subpopulation level. Thirteen of Canada's 14 subpopulations are actively managed by Canadian authorities, whereas the Arctic Basin subpopulation, which lies to the north of any permanent settlements, is not actively managed. The federal addition to the National Polar Bear Management Plan applies to Canada's Polar Bear Designatable Unit as a whole.

For additional information pertaining to the ecology and natural history of the Polar Bear, please refer to Parts 2 – 7 of this Management Plan.

3.2 Population and Distribution

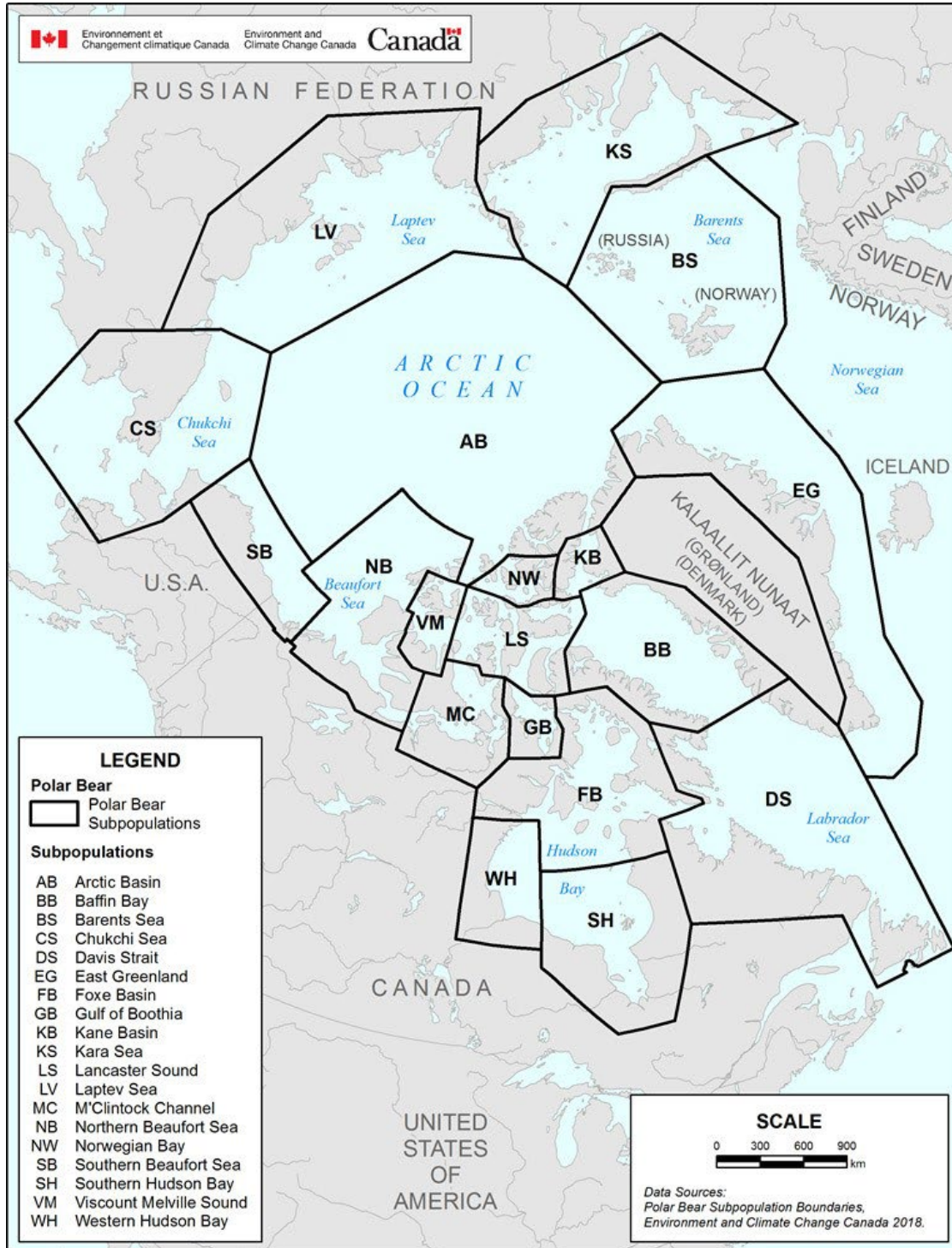


Figure 1: Global Polar Bear subpopulations (source: ECCC 2018b)

Canada is home to approximately 16,000⁸ of the estimated 20,000 – 26,000 Polar Bears found throughout the circumpolar arctic. Subpopulation surveys are conducted according to a pre-determined schedule of studies, with an objective of obtaining updated abundance estimates every 5 to 15 years. It is not logistically feasible to survey all subpopulations concurrently and some subpopulations have not been surveyed in >15 years. As such, it is difficult to generate a precise estimate of the overall abundance of Polar Bear in Canada.

The boundaries of Polar Bear subpopulations in Canada are delineated based on the best available scientific and Indigenous Knowledge related to the movements and genetics of Polar Bears, as well as management considerations (Figure 1) (Lunn et al. 2010). The term “subpopulation”, as used in this document, is consistent with its use by the International Union for the Conservation of Nature (IUCN)/Species Survival Commission (SSC) Polar Bear Specialist Group (PBSG), and Canada’s Polar Bear Technical Committee (PBTC) (for more information on the PBTC, please refer to section 6.1). The term subpopulation as applied to Polar Bear has the same meaning as the term “management unit” as used in COSEWIC assessment and status reports for the species.

In Canada, Polar Bear management is a shared responsibility of federal, provincial and territorial governments, Wildlife Management Boards/Advisory Councils, and Land Claim Organizations that represent Indigenous rights holders. With respect to government regulation, provinces and territories have authority over Polar Bears on provincial and territorial lands. The federal government has authority on federal lands, such as National Parks and National Wildlife Areas. Offshore areas in Canada are generally under federal authority, however, within Indigenous land claim settlement areas that encompass both land and sea (Inuvialuit Settlement Area, Nunavut, Nunatsiavut), provincial and territorial authorities exercise management actions, such as the determination and enforcement of harvest levels, that have application onshore and offshore, in accordance with treaty and land claims processes.

Organizations with management authority for Polar Bears in Canada, including federal, provincial and territorial governments, Wildlife Management Boards/Advisory Councils and Land Claim Organizations that represent Indigenous rights holders, work together to manage Polar Bears in Canada. More information about Canada’s domestic conservation and management of Polar Bears can be found in section 6.1 of this document.

Most of the Polar Bear range in Canada occurs within areas where modern Crown-Indigenous Land Claims Agreements are in place. Within these Land Claims Areas, Total Allowable Take/Harvest levels are determined in processes that flow through Wildlife Management Boards/Advisory Councils. Table 3 enumerates the relevant Wildlife Management Boards/Advisory Councils or other similar entities for each subpopulation, as well as the federal, provincial and territorial governments to which Polar Bear harvest management

⁸ The estimate of a Canadian population of 16,000 Polar Bears is a summation of the most recent estimates for each subpopulation. This sum was reached by adding the abundance estimates for each subpopulation from the most recent PBTC status table (2020).

decisions or recommendations are currently forwarded. The jurisdictional plans in Parts 2-7 of this Management Plan (noted in Table 3) provide additional information regarding Polar Bear subpopulations throughout Canada and provide jurisdiction-specific management objectives and actions.

Table 3. Canadian Polar Bear subpopulations and the management authorities that currently share decision-making responsibility.

Subpopulation	Wildlife Management Boards, Advisory Councils and Other Similar Entities[†]	Canadian Federal, Provincial and Territorial Management Authorities	Foreign Governments and other Co-Management Partners	Corresponding Jurisdictional document(s):
Arctic Basin * (AB)	NWMB, IGC, WMAC (NWT)	Nunavut, Northwest Territories	Greenland, Norway, Russia and the United States	See Parts 2 and 3 of this document
Baffin Bay (BB)	NWMB	Nunavut	Greenland	See Part 3 of this document
Davis Strait (DS)	NWMB, NMRWB, HFTCC, TWPCB	Canada, Nunavut, Québec, Newfoundland and Labrador	Greenland	See Parts 3, 6 and 7 of this document
Foxe Basin (FB)	NWMB, NMRWB, HFTCC	Canada, Nunavut, Québec	None	See Parts 3 and 6 of this document
Gulf of Boothia (GB)	NWMB	Nunavut	None	See Part 3 of this document
Kane Basin (KB)	NWMB	Nunavut	Greenland	See Part 3 of this document
Lancaster Sound (LS)	NWMB	Nunavut	None	See Part 3 of this document
M'Clintock Channel (MC)	NWMB	Nunavut	None	See Part 3 of this document

Subpopulation	Wildlife Management Boards, Advisory Councils and Other Similar Entities [†]	Canadian Federal, Provincial and Territorial Management Authorities	Foreign Governments and other Co-Management Partners	Corresponding Jurisdictional document(s):
Northern Beaufort Sea (NB)	NWMB, IGC, WMAC (NWT)	Nunavut, Northwest Territories	None	See Parts 2 and 3 of this document
Norwegian Bay (NW)	NWMB	Nunavut	None	See Part 3 of this document
Southern Beaufort Sea (SB)	IGC, WMAC (NWT), WMAC (NS)	Northwest Territories, Yukon	United States, Iñupiat	See Part and 3 of this document
Southern Hudson Bay (SH)	NWMB, NMRWB, EMRWB, HFTCC	Canada, Nunavut, Québec, Ontario	None	See Parts 3, 5 and 6 of this document
Viscount Melville Sound (VM)	NWMB, IGC, WMAC (NWT)	Nunavut, Northwest Territories	None	See Parts 2 and 3 of this document
Western Hudson Bay (WH)	NWMB	Nunavut, Manitoba, Ontario	None	See Parts 3, 4 and 5 of this document

[†]Abbreviations. EMRWB: Eeyou Marine Region Wildlife Management Board; HFTCC: James Bay and Northern Québec Agreement (JBNQA) Hunting, Fishing and Trapping Coordinating Committee; IGC: Inuvialuit Game Council; NMRWB: Nunavik Marine Region Wildlife Management Board; NWMB: Nunavut Wildlife Management Board; TWPCB: Torngat Wildlife and Plants Co-Management Board; WMAC-NS: Wildlife Management Advisory Council – North Slope; WMAC (NWT): Wildlife Management Advisory Council – Northwest Territories.

* Note that there is no active monitoring or management in the Arctic Basin subpopulation

The status of Canada's Polar Bear subpopulations is updated by the Polar Bear Technical Committee when new information is available, and information pertaining to subpopulation status can be found on the [Polar Bear Administrative Committee's website⁹](https://www.polarbearsCanada.ca/en/polar-bears-canada/canadas-polar-bear-subpopulations). For more information pertaining to the Polar Bear Administrative Committee and the Polar Bear Technical Committee, please refer to section 6.1 of Part 1 of this Management Plan.

⁹ <https://www.polarbearsCanada.ca/en/polar-bears-canada/canadas-polar-bear-subpopulations>

Indigenous peoples and Polar Bear:

In Canada, the Polar Bear has and continues to play an integral role in the social, cultural, and economic lives of northern Indigenous peoples. The species is intricately linked to the traditions of northern Indigenous peoples who have harvested the Polar Bear for thousands of years and valued the species for both consumptive and non-consumptive purposes (COSEWIC 2018). The Polar Bear has been a principal feature in cultural and traditional forms of expression and imagination including mythology, spirituality, storytelling, art, and song (Saladin 1990; Joint Secretariat 2017).

Indigenous peoples recognize the Polar Bear for its importance in preserving cultural identity and connection to the environment (Species at Risk Committee 2021). The act of hunting is essential for building and fostering human-animal and human-human relationships (Dowsley and Wenzel 2008), promoting a sense of community through celebration, social gathering and storytelling, in addition to sharing food from the hunt (Slavik 2013). The Polar Bear has been used for subsistence in many northern communities through the consumption of meat (Slavik 2010; Wenzel 2011; Freeman and Wenzel 2006). In addition to the subsistence and cultural importance of Polar Bear, the hides, teeth, claws, bones, and skulls from a harvested Polar Bear are used for clothing, mattresses, tools, household items and medicine, in addition to being sold as artifacts and crafts. Due to the economic value of the species, Polar Bear hides, teeth, claws, bones and skulls may also enter the commercial trade (Slavik 2013; Peacock et al. 2011; Kendrick 2013). The continued hunting of the Polar Bear is an essential part of the identity, values, livelihood, and culture of northern Indigenous peoples in Canada.

3.3 Needs of the Species

In Canada, Polar Bears rely on both marine (sea ice) and terrestrial habitat to meet their life history requirements. Their area of occupancy includes landfast, offshore pack ice, maritime coastlines with a preference for areas over the continental shelf and terrestrial areas (within 50 kilometers of the coast and up to 120 kilometers in some cases) of Labrador, Québec, Ontario, Manitoba, Nunavut, Northwest Territories, and Yukon (COSEWIC 2018). This range encompasses regions where sea ice melts completely each summer (known as annual sea ice); areas where sea ice forms along the shore and then retreats during summer, but remains offshore; and areas where locally formed or transported ice remains year-round (known as convergent or archipelago sea ice) (Atwood et. al 2016). Some Polar Bears are also known to frequent multi-year ice, and some have also been observed traveling long distances in-land between ocean bays (Joint Secretariat 2015). Within each of these ice ecoregions, the productivity of Polar Bear habitat is closely linked to the physical attributes of sea ice and the density and distribution of ice-dependent seals, especially ringed seals (*Pusa hispida*) (Stirling et al. 1997; Stirling 2002; Pilfold et al. 2015).

The relationship between Polar Bears, sea ice, and prey (primarily ringed and bearded seals) is extremely complex, involving ice conditions, type (such as multi-year and annual ice, and local

conditions like pressure ridges, open leads, and rubble ice), thickness, and location (SARC 2021). Polar Bear locations, body condition, and productivity are closely and complexly related to ice conditions, ocean productivity, and seals, and they must be understood in the context of large interannual variation (SARC 2021).

For additional information pertaining to the biology, ecological role and habitat needs of the Polar Bear, please refer to Parts 2 – 7 of this Management Plan.

4. Threats

4.1 Threat Assessment

The Polar Bear threat assessment is based on the IUCN-CMP (World Conservation Union–Conservation Measures Partnership) unified threats classification system. Threats are defined as the proximate activities or processes that have caused, are causing, or may cause in the future the destruction, degradation, and/or impairment of the entity being assessed (population, species, community, or ecosystem) in the area of interest (global, national, or subnational). Limiting factors are not considered during this assessment process. In this threat assessment, only present and future threats (over the next 10 years) are considered. Historical threats, indirect or cumulative effects of the threats, or any other relevant information that would help understand the nature of the threats are presented in the Description of Threats section.

The threat assessment for Polar Bear (below) was conducted in April 2018, and was led by COSEWIC. Polar Bear co-management partners (e.g. federal, provincial and territorial governments, Wildlife Management Boards/Advisory Councils, Indigenous governments, Indigenous organizations, and University researchers) throughout Canada were represented. The threat assessment pertains to the single Polar Bear Designatable Unit in Canada, as defined by COSEWIC, and was developed using the best available information.

Table 4. Threat calculator assessment¹⁰.

Threat #	Threat description	Impact ^a	Scope ^b	Severity ^c	Timing ^d
1	Residential & Commercial Development	Negligible	Negligible (<1%)	Extreme (71-100%)	High (Continuing)
1.1	Housing & Urban areas	Negligible	Negligible (<1%)	Extreme (71-100%)	High (Continuing)

¹⁰ This threat calculator assessment is taken directly from the 2018 In-Press COSEWIC Assessment and Status Report on the Polar Bear *Ursus maritimus* in Canada.

Threat #	Threat description	Impact ^a	Scope ^b	Severity ^c	Timing ^d
1.2	Commercial & Industrial areas	Negligible	Negligible (<1%)	Extreme (71-100%)	Insignificant/Negligible (past or no direct effect)
3	Energy Production & Mining	Negligible	Negligible (<1%)	Extreme (71-100%)	Low (possibly in the long term, >10 years/3 generations)
3.1	Oil & Gas Drilling	Negligible	Negligible (<1%)	Extreme (71-100%)	Low (possibly in the long term, >10 years/3 generations)
3.2	Mining & Quarrying	Negligible	Negligible (<1%)	Extreme (71-100%)	Low (Possibly in the long term, >10 years/3 generations)
4	Transportation & Service Corridors	Negligible	Small (1-10%)	Negligible (<1%)	Moderate (possibly in the short term, <10 years/3 generations)
4.1	Roads & Railroads	Negligible	Negligible (<1%)	Negligible (<1%)	Low (Possibly in the long term, >10 years/3 generations)
4.2	Utility & Service Lines	Negligible	Negligible (<1%)	Negligible (<1%)	Insignificant/ Negligible (Past or no direct effect)
4.3	Shipping Lanes	Negligible	Small (1 – 10%)	Negligible (<1%)	Moderate (Possibly in the short term, < 10 years/3 generations)
4.4	Flight Paths	Not a Threat	Negligible (<1%)	Neutral or Potential Benefit	High (Continuing)
5	Biological Resource Use	Low	Pervasive (71-100%)	Slight (1-10%)	High (continuing)
5.1	Hunting & Collecting Terrestrial animals	Low	Pervasive (71-100%)	Slight (1-10%)	High (Continuing)
6	Human Intrusions & Disturbance	Negligible	Restricted (11-30%)	Negligible (<1%)	High (continuing)
6.1	Recreational Activities	Negligible	Small (1 – 10%)	Negligible (<1%)	High (Continuing)
6.2	War, Civil Unrest, & Military Exercises	Negligible	Negligible (<1%)	Negligible (<1%)	High (Continuing)
6.3	Work & Other Activities	Negligible	Restricted (11 – 30%)	Negligible (<1%)	High (Continuing)

Threat #	Threat description	Impact ^a	Scope ^b	Severity ^c	Timing ^d
7	Natural System Modifications	Unknown	Small (1 – 10%)	Unknown	High (continuing)
7.1	Fire & Fire Suppression	Not a threat	Negligible (<1%)	Neutral or Potential Benefit	High (Continuing)
7.2	Dams & Water Management/Use	Not a threat	Negligible (<1%)	Neutral or Potential Benefit	Low (Possibly in the long term, >10 years/3 generations)
7.3	Other Ecosystem Modifications	Unknown	Small (1 – 10%)	Unknown	High (Continuing)
8	Invasive & Other Problematic Species & Genes	Unknown	Pervasive – Large (31-100%)	Unknown	High (Continuing)
8.1	Invasive Non-Native/Alien Species	Unknown	Unknown	Unknown	High (Continuing)
8.2	Problematic Native Species/Diseases	Unknown	Pervasive – Large (31 – 100%)	Unknown	High (Continuing)
8.3	Introduced Genetic Material	Negligible	Small (1 – 10%)	Negligible (<1%)	High (Continuing)
9	Pollution	Low	Pervasive (71-100%)	Slight (1-10%)	High (Continuing)
9.1	Domestic & Urban Waste Water	Negligible	Negligible (<1%)	Unknown	High (Continuing)
9.2	Industrial & Military Effluents	Unknown	Small (1 – 10%)	Unknown	High (Continuing)
9.3	Agricultural & Forestry Effluents	Negligible	Negligible (<1%)	Unknown	High (Continuing)
9.4	Garbage & Solid Waste	Negligible	Small (1-10%)	Negligible (<1%)	High (Continuing)
9.5	Air-Borne Pollutants	Low	Pervasive (71 – 100%)	Slight (1-10%)	High (Continuing)
10	Geological Events	Negligible	Negligible (<1%)	Negligible (<1%)	High (Continuing)
10.3	Avalanches/Landslides	Negligible	Negligible (<1%)	Negligible (<1%)	High (Continuing)

Threat #	Threat description	Impact ^a	Scope ^b	Severity ^c	Timing ^d
11	Climate Change & Severe Weather	High	Pervasive (71-100%)	Serious (31-70%)	High (Continuing)
11.1	Habitat Shifting & Alteration	High	Pervasive (71 – 100%)	Serious (31-70%)	High (Continuing)
11.2	Droughts	Negligible	Negligible (<1%)	Unknown	Low (Possibly in the long term, >10 years/3 generations)
11.3	Temperature Extremes	Unknown	Small (1 – 10%)	Unknown	High (Continuing)
11.4	Storms & Flooding	Unknown	Unknown	Unknown	High – Low
11.5	Other Impacts	Unknown	Unknown	Unknown	Unknown

^a **Impact** – The degree to which a species is observed, inferred, or suspected to be directly or indirectly threatened in the area of interest. The impact of each threat is based on Severity and Scope rating and considers only present and future threats. Threat impact reflects a reduction of a species population or decline/degradation of the area of an ecosystem. The median rate of population reduction or area decline for each combination of scope and severity corresponds to the following classes of threat impact: Very High (75% declines), High (40%), Medium (15%), and Low (3%). Unknown: used when impact cannot be determined (e.g., if values for either scope or severity are unknown); Not Calculated: impact not calculated as threat is outside the assessment timeframe (e.g., timing is insignificant/negligible or low as threat is only considered to be in the past); Negligible: when scope or severity is negligible; Not a Threat: when severity is scored as neutral or potential benefit.

^b **Scope** – Proportion of the species that can reasonably be expected to be affected by the threat within 10 years. Usually measured as a proportion of the species' population in the area of interest. (Pervasive = 71–100%; Large = 31–70%; Restricted = 11–30%; Small = 1–10%; Negligible < 1%).

^c **Severity** – Within the scope, the level of damage to the species from the threat that can reasonably be expected to be affected by the threat within a 10-year or three-generation timeframe. Usually measured as the degree of reduction of the species' population. (Extreme = 71–100%; Serious = 31–70%; Moderate = 11–30%; Slight = 1–10%; Negligible < 1%; Neutral or Potential Benefit ≥ 0%).

^d **Timing** – High = continuing; Moderate = only in the future (could happen in the short term [< 10 years or 3 generations]) or now suspended (could come back in the short term); Low = only in the future (could happen in the long term) or now suspended (could come back in the long term); Insignificant/Negligible = only in the past and unlikely to return, or no direct effect but limiting.

4.2 Description of Threats

The information in section 4.2 is based on the “Threats” section of the COSEWIC Assessment and Status Report on the Polar Bear, which was published in fall 2019. For more information on Threats to Polar Bears in Canada, refer to parts 2 – 7 of this Management Plan.

The primary threats to Polar Bear in Canada include the following:

High Threat Categories:

Climate Change and Severe Weather (IUCN/CMP Threat # 11.1 – Habitat Shifting and Alteration):

The most significant threat facing the Canadian and global Polar Bear population is sea ice habitat loss resulting from increased atmospheric temperatures caused by global greenhouse gas emissions (Tynan and DeMaster 1997; Derocher et al. 2004; Laidre et al. 2008; Kovacs et al. 2010; IPCC 2013). Over the past 40 years, data from satellites have shown a decrease in arctic sea ice cover which is unparalleled in the past 150 years (Derksen et al. 2019). Inuvialuit Knowledge holders have observed intensifying effects of climate change on the ocean and weather since the 1980s. The forecasted continuation of these changes will result in sea ice habitat loss, likely leading to direct and indirect negative effects on Polar Bear body condition, adult and cub survival rates, reproductive success, distribution and abundance of prey, contaminant transfer, and habitat fragmentation (COSEWIC 2018). For example, declines in the recruitment of Ringed Seals (the primary prey of Polar Bears in many areas) have been noted and linked to warmer temperatures and decreasing snow depth (Ferguson et al. 2005). Declines in distribution and abundance of Ringed Seals will likely impact the ability of Polar Bears to harvest their primary prey (Stirling and Øritsland 1995; Hart and Amos 2004; Keith 2005; Joint Secretariat 2015; York *et al.* 2015).

Negative impacts of sea ice habitat loss have been recorded in several subpopulations, though considerable regional variability exists (Derksen et al. 2019). Based on current trends, it is expected that greenhouse gas emissions will continue to increase, leading to a decrease in sea ice habitat (Stern and Laidre 2016; Wiig et al. 2015). For example, in the Arctic Ocean, a substantial portion of the multiyear ice, which traditionally lasts for at least one complete summer melt season, has been replaced by seasonal first-year ice, the entirety of which melts during the summer (Derksen et al. 2019). Though climate change is widely believed to lead to decreased habitat availability for Polar Bears, some have hypothesized that areas in Canada's far north which are currently covered in thick multiyear ice may gradually convert to a largely seasonal/annual ice cover (Derocher et al. 2004). Sunlight is able to penetrate seasonal/annual ice to a larger extent than multiyear ice, and increased sunlight is likely to lead to greater biological productivity in the far north. Some research suggests that this conversion from multiyear ice to seasonal/annual ice cover may facilitate the development of conditions that are more suitable for Polar Bears than are currently present in northern subpopulations (Derocher et al. 2004; Stirling and Derocher 2012). In particular, an increase in the primary productivity of an ecosystem can lead to the formation of better ice habitat for Ringed Seals and other Polar Bear prey (Kingsley et al. 1985; Derocher et al. 2004; Arrigo et al. 2008; Barber et al. 2015). Some Indigenous Knowledge holders have indicated that a transition from multiyear ice to annual ice may benefit Polar Bears because annual ice provides better seal hunting platforms. Others suggest that Polar Bears may move north to follow multiyear ice (SARC 2021). Subpopulations with high proportions of multiyear sea ice, such as Norwegian

Bay, M'Clintock Channel, and Lancaster Sound, may eventually experience this gradual shift from multiyear ice to a largely annual/seasonal ice cover (Stirling and Derocher 2012). This is further discussed below.

In seasonal ice environments, Polar Bears accumulate fat reserves to survive the ice-free season fasting period, and pregnant female Polar Bears must reach a body mass sufficient to sustain their survival during winter denning and lactation periods (Watts and Hansen 1987; Atkinson and Ramsay 1995; Robbins et al. 2012). During the spring hyperphagic¹¹ period, Polar Bears forage in an effort to gain weight and improve body condition (Molnár et al. 2010, 2014; Pilfold et al. 2016a). However, during the ice-free season, research in Hudson Bay found that fasting adult males held at the Churchill holding facility experienced a median weight loss of approximately 1 kilogram per day (Pilfold et al. 2016a). These findings aligned with observations on fasting free-ranging bears on land (Atkinson et al. 1996, Polischuk et al. 2002). If foraging time is decreased as a result of sea ice loss due to climate change, this may lead to declines in body condition, which may affect Polar Bear survivorship, reproduction and abundance (Stirling and Archibald 1977; Stirling and Øritsland 1995; Stirling et al. 1999). Recent research on the Baffin Bay subpopulation supports this concern. Earlier spring retreat of sea ice and later reform in the fall has resulted in an extended ice-free season, which led Polar Bears in the Baffin Bay subpopulation to spend at least 30 more days on land between 2009 and 2015, as compared to the amount of time spent on land between 1991 and 1997. This extended ice-free season has also been associated with a corresponding reduction in body size and reproductive success among the Baffin Bay subpopulation (Laidre et al. 2020). However, Indigenous Knowledge holders have noted that despite significant changes in habitat conditions due to climate change, the impact of sea ice loss on Polar Bears is unclear, given the complexity of sea ice habitat (SARC 2021). Ice conditions are fundamentally important and are changing Polar Bear movements and range, but population and body condition have been observed to be stable over time in the Northern and Southern Beaufort Sea, notwithstanding considerable variation between seasons and years (JS 2015).

One empirical effect of climate change in arctic marine ecosystems has been the gradual replacement of multiyear ice with seasonal/annual sea ice, which melts completely during summer (Derksen et al. 2019). As discussed above, a transition from multiyear ice to predominantly seasonal/annual sea ice may lead to an increase in primary productivity and improved sea ice habitat. If this hypothesis is correct, it is reasonable to suggest that this change will, at least initially, benefit Polar Bears in subpopulations with high proportions of multiyear ice (Stirling and Derocher 2012). However, considerable uncertainty surrounds the ecological ramifications of the gradual replacement of multiyear ice with seasonal/annual sea ice in arctic ecosystems (COSEWIC 2018). Indigenous Knowledge is an excellent source of information on changes in Polar Bear distribution and feeding habits, and should be utilized to help determine the implications of such changes on Polar Bears. Over the long term, if sea ice loss continues, scientific evidence suggests that negative impacts are expected as outlined above.

¹¹ A period of excessive food consumption (COSEWIC 2018).

If sea ice becomes increasingly fragmented due to climate change, the temporal and spatial distribution of Polar Bear habitat may become compromised (Sahanatien and Derocher 2012). If climate change leads to a loss of multiyear sea ice, it is hypothesized that the fidelity that some Polar Bears have shown to some specific regions may be disrupted (Schweinsburg and Lee 1982; Schweinsburg et al. 1982; Taylor et al. 2001). Changes in sea ice distribution and break-up timing can separate Polar Bears from important habitat such as the receding multiyear sea ice front, summer retreat habitat, and traditional denning areas in the spring and summer (COSEWIC 2018), and can delay Polar Bears from returning to sea ice in the fall/winter (Derocher et al. 2004; Durner et al. 2011; Pagano et al. 2012; Stirling and Derocher 2012; Laidre et al. 2020). In the Baffin Bay subpopulation, for example, it is hypothesized that sea ice loss is associated with seasonal range contraction (Laidre et al. 2008). Furthermore, Polar Bears have been observed to undertake more energy intensive long distance swims due to increased distance between pack and landfast ice, or as a result of sea ice fragmentation (Monnett and Gleason 2006; Molnár et al. 2007; Durner et al. 2011; Pagano et al. 2012; Pilfold et al. 2016b). The energetic demands created by long-distance swims may be a contributing factor to Polar Bear mortality, though there are currently no known cases of Polar Bear mortality occurring as a direct result of drowning (Pagano et al. 2012). Mating opportunities (Molnár et al. 2007; Molnár et al. 2008) and access to foraging areas may also be reduced as a result of a loss of spatial connectivity of sea ice in the spring (COSEWIC 2018). Indigenous Knowledge holders have also noted changes in Polar Bear distribution, movements, and local abundance over time related to ice and weather conditions (SARC 2021). Because sea ice habitat is often naturally fragmented, it is important for Polar Bears to be able to swim long distances (Slavik et al. 2009). However, changes in sea ice habitat may put stress on their adaptability with potential impacts on their health and diet, range and movements (SARC 2021).

It is known that Polar Bears rely on the presence of sea ice platforms to enable them to capture their primary prey (i.e. ringed seals) (Stern and Laidre 2016), however, more research is needed to fully understand the impacts of climate change on Polar Bears, and the extent to which climate change will amplify the other threats listed below. For example, while it has been hypothesized that Polar Bears may be able to adapt to a changing climate by shifting their diet to terrestrial-based food sources (COSEWIC 2018), considerable uncertainty exists surrounding the ability of Polar Bears to compensate for diminished access to marine food sources in this manner (Rode et al. 2015; Sciuillo et al. 2016).

Given the unpredictable and variable nature of Polar Bear habitat, as well as the intelligence and adaptability of Polar Bears themselves, Indigenous Knowledge holders have emphasized the need for humility in understanding Polar Bears and their habitat, and the importance of not speculating about the future (Joint Secretariat 2015).

For more information on climate change-related initiatives being led by Environment and Climate Change Canada, please refer to the Broad Strategies, section 6. More information on climate change-related initiatives being led by provinces and territories can be found in parts 2 – 7 of this Management Plan.

Low Threat Categories:

Biological Resource Use (IUCN/CMP Threat # 5.1 – Hunting and Gathering Terrestrial Animals):

Polar Bear harvest is a legally-protected right of Indigenous people in Canada. In areas where Canada has concluded modern Land Claims Agreements, Polar Bear harvest quotas are determined or recommended by Wildlife Management Boards or Advisory Councils that include representatives from the Government of Canada, provincial or territorial governments, and Indigenous organizations/governments. Total Allowable Harvest levels (or harvest quotas) are currently in place throughout Nunavut, the Inuvialuit Settlement Region (Yukon and Northwest Territories) and Nunatsiavut (Newfoundland and Labrador) to manage for sustainable harvest. Within the Nunavik Marine Region and an overlap area between the Nunavik Marine Region and Eeyou Marine Region, which is offshore from Québec, a harvest quota has been established by the Government of Canada and the Government of Nunavut for the Southern Hudson Bay subpopulation. In mainland (onshore) areas of Ontario, Manitoba and Québec, harvest management falls under the jurisdiction of the respective provinces. In Ontario, Treaty 9 does not set out a process for cooperative federal-provincial-Indigenous harvest management, and Indigenous implementation of provincial harvest limits is voluntary. In Manitoba, provincial legislation does not permit the harvesting of Polar Bear. In Québec, the James Bay and Northern Québec Agreement (JBNQA) sets out a guaranteed harvest level for subsistence requirements, subject to the principles of conservation.

Guided sport hunting is permitted in Nunavut and the Inuvialuit Settlement Region (ISR), via transfer of exclusive right, and in both jurisdictions local hunting and trapping organizations decide if they wish to allocate a portion of the quota to this practice. Guided sport hunting is closely regulated by Inuit communities and is part of the harvest management system mentioned above. In both jurisdictions, guided sport hunts must be conducted using traditional methods, including the use of dog sled teams as a means of transportation. In both jurisdictions, if a Polar Bear is successfully harvested, it counts against the quota. Therefore, the total number of Polar Bears that may be harvested as a result of guided sport hunting does not increase the overall harvest. Additionally, in the Inuvialuit Settlement Region, once a tag is provided to a guided hunt it cannot be reused, whether or not the hunt was successful (Joint Secretariat 2017).

Other human-induced Polar Bear mortality can include defense of life and property kills and humane kills. The frequency of defense of life and property kills generally increases during the ice-free season when Polar Bears are on land (McDonald et al. 1997; Makivik Corporation 2001; Stirling and Parkinson 2006; Dowsley 2007; Dowsley and Wenzel 2008; Canadian Wildlife Service 2009; Nirlungayuk and Lee 2009; Towns et al. 2009; Henri 2010, 2012; Kotierk 2010; Lemelin et al. 2010; Clark et al. 2012). A number of different factors have the potential to increase the frequency of defense kills. Some of these factors include the increasing length of

time Polar Bears spend on land due to longer ice-free seasons, increased Polar Bear-human interaction, bears coming off the sea ice in poor body condition, increasing human activity (e.g. growing communities, camps, tourism, mineral exploration and development, oil and gas industry, research activity) in Polar Bear habitat, and greater amounts of garbage and carcasses to attract bears (Stenhouse et al. 1988; Stirling et al. 1999; Derocher et al. 2004; Dyck 2006; Schliebe et al. 2008). In areas where quotas exist, defense of life and property kills are usually taken out of the total allowable harvest of that area. When a Polar Bear is sick or injured, the usual practice is for a Conservation Officer to carry out a humane kill. Unlike defense of life and property kills, humane kills are usually not taken out of the total allowable harvest for the area where the humane kill occurs (Government of Nunavut 2018). The exception to this is within the ISR, where humane kills are taken out of the total allowable harvest.

From the 2014-2015 season to the 2018-2019 season, the average number of human-caused mortalities (including harvest, defense kills, mortalities due to research), and mortalities due to other human activity (such as a Polar Bear being struck by a vehicle, or a ship) of Polar Bears within Canadian subpopulations (and subpopulations shared with other countries) was approximately 519.3 annually.

Canada has had a strong adaptive management system in place for Polar Bears for decades (PBAC 2011). This management system is based on conservation principles and Indigenous harvesting rights (PBAC 2011). It is an ongoing and dynamic collaboration between partners involved in Polar Bear management in Canada. Polar Bear harvest systems vary by jurisdiction, and are described in Parts 2 – 7 of this document.

Polar Bears face naturally limiting factors, such as low reproductive rates due to delayed maturity, small litter sizes, 2-3 years of maternal dependency, and high cub mortality (Bunnell and Tait 1981). While the number of Polar Bears harvested in Canada each year is typically well below the Total Allowable Harvest on a national scale, if harvest and other sources of human-induced mortality are not properly managed, these naturally limiting factors may contribute to population declines (COSEWIC 2018).

For more information on polar bear harvest management, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Pollution (IUCN/CMP Threat # 9.1 – Domestic & Urban Waste Water; IUCN/CMP Threat # 9.2 – Industrial & Military Effluents; IUCN/CMP Threat # 9.4 – Garbage & Solid Waste; IUCN/CMP Threat # 9.5 – Air-Borne Pollutants):

Apex predators, including Polar Bears, are often exposed to high levels of organic and inorganic pollutants due to the fact that the pollutants bioaccumulate in the marine food web (AMAP 2017). Polar Bears' reliance on a high-fat diet of marine species increases their indirect

exposure to chlorinated, brominated, and fluorinated compounds¹², and heavy metals (AMAP 2017). Most of these pollutants originate in industrialized areas of the world and are transported to arctic marine ecosystems (Bard 1999), though some are currently sequestered in glaciers and permafrost and may be released as atmospheric temperatures rise (Schuster et al. 2018).

Pollution levels, types of pollutants (i.e. organic vs inorganic), and temporal patterns in pollutant levels vary across Polar Bear subpopulations (Norstrom et al. 1998; Dietz et al. 2006; Letcher et al. 2010, 2018). Some research has shown that pollutants affect Polar Bears' sex steroids, thyroid levels, vitamins, growth and development, liver and renal histopathology, reproductive organs, central nervous system toxicity, bone density, immune system function, carcinogenicity, and reproductive performance (e.g., McKinney et al. 2010; Sonne 2010; Sonne et al. 2011; Dietz et al. 2015; Gabrielsen et al. 2015). There is concern that lactating female Polar Bears may transfer pollutants to their offspring through their milk (Polischuk et al. 2002; Bytingsvik et al. 2012; Jenssen et al. 2015).

Correlative studies have found relationships between biological processes (e.g., hormone level, bone density) and pollution quantity at the individual level (Sonne 2010). Generally, it is difficult to demonstrate that pollutants cause population level declines (Jenssen et al. 2015). However, one study documented high enough concentrations of PCB, DDT, etc. in archived tissue samples from Svalbard to conclude that toxins likely limited the growth of the Polar Bear population that was expected after a prohibition on Polar Bear hunting was implemented (Derocher et al. 2003).

It has been hypothesized that as sea ice melts, Polar Bears will increasingly seek terrestrial food sources (Gormezano et al. 2013), and in doing so may wander into human settlements where they may come into contact with and ingest plastics. More research is needed on the effects of plastics on Polar Bears (Orihel et al. 2019). Both scientific research and Indigenous Knowledge have identified the presence of plastics in Polar Bear scat (Gormezano et al. 2013; Toth 2019) and in the stomachs of harvested Polar Bears (Iversen et al. 2013; Toth 2019). However, the intention of these studies was not to focus on the quantity of plastics in Polar Bear stomachs or scat. Additional scientific and Indigenous Knowledge research is required to determine whether increased exposure of Polar Bears to plastics will have a population-level impact on the species. For more information on polar bears and pollution, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Negligible Threat Categories:

¹² Chlorinated, brominated and fluorinated compounds primarily originate from industrial and agricultural activities south of the arctic, and are transported to the arctic by air and ocean currents and river outflows (Routti et al. 2019).

Energy Production and Mining (IUCN/CMP Threat # 3.1 – Oil & Gas Drilling; IUCN/CMP Threat # 3.2 – Mining & Quarrying):

Human activity involving exploration for energy and minerals has been occurring in the arctic since the mid-1960s (COSEWIC 2018). Oil and fuel spills have the potential for mortality and disturbance of Polar Bears (Stirling et al. 1990; Hurst et al. 1991; Durner et al. 2000; Arctic Council 2009). Some studies have shown that Polar Bears may experience an inability to effectively thermoregulate if their fur is oiled. Organ failure and death can occur if Polar Bears ingest oil by grooming or eating contaminated prey (Stirling et al. 1990; Hurst et al. 1991; Durner et al. 2000; Arctic Council 2009). Maternity den disturbance also may occur, and negative impacts to Polar Bear prey (such as seals) have occurred as direct result of oil and fuel spills (COSEWIC 2018). No major spills have occurred to date in areas where Polar Bear inhabit, and this may be partially attributable to the relative inaccessibility of the Northwest Passage in its current state. There is, however, potential for significant ecological consequences if a large spill does occur, as current infrastructure and capacity for handling large spills is limited in the Canadian arctic (COSEWIC 2018). In the event that wildlife is exposed to spills of hazardous chemicals, such as hydrocarbons, there are no facilities available for decontamination (COSEWIC 2018). The Government of Canada is currently undertaking initiatives to mitigate the negative ecological consequences of potential future oil and fuel spills (Transport Canada 2018a). For example, \$1.5 billion has been invested in Canada's Oceans Protections Plan with the goal of protecting Canada's coasts and waterways. In particular, \$161 million of that \$1.5 billion investment will help achieve greater marine protection for Canada's arctic, through initiatives such as expanding the National Aerial Surveillance Program to detect oil spills in the arctic (Transport Canada 2018b).

Large oil and gas reserves occur within the Norwegian Bay, Davis Strait, Baffin Bay, Lancaster Sound, Viscount Melville Sound, and Southern and Northern Beaufort Sea subpopulations (Chen et al. 2004; Gautier et al. 2009). In the past, these reserves were not exploited because of their northern location and the challenging environments in which they occur. However, environmental change is likely to facilitate greater industrial access to oil and gas reserves, leading to an increase in industrial activities in the arctic (Prowse et al. 2009). Increasing exploration, seismic activity and development is occurring in the Davis Strait subpopulation (CNLOPB 2018), though the majority occurs in the Greenland portion of the Davis Strait subpopulation. The Lancaster Sound subpopulation is an exception to this, as a large portion of this subpopulation is covered by the Tallurutiup Imanga National Marine Conservation Area. No oil or gas extraction is permitted within National Marine Conservation Areas (Parks Canada 2018a).

Intense mineral exploration occurs across much of the Canadian arctic within the range of Polar Bears in the Northwest Territories, Nunavut, Québec and Labrador (COSEWIC 2018). Polar Bears can be displaced from terrestrial ice-free season refuge and denning habitat by construction of mines (Amstrup 1993; Linnell et al. 2000; Atatahak and Banci 2001; Dyck and Baydack 2004; Keith 2005; Slavik 2010, 2013), and if year-round shipping occurs in association with mining operations, displacement from marine habitat is also possible (COSEWIC 2018). The

construction of mines and associated year-round shipping are both subject to approval via the processes set out in the applicable Land Claims Agreements.

For more information on polar bears and energy production and mining, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Transportation and Service Corridors (IUCN/CMP Threat # 4.3 – Shipping and Shipping Lanes):

Over the past 10 years, the amount of shipping activity in Canadian arctic waters has increased (Derksen et al. 2019). Disturbance and the potential for shipping accidents associated with increasing levels of shipping activity in the arctic, including community re-supply, industrial shipping and tourism, present increasing threats to Polar Bears (PBAC 2011).

Construction of new ports and year-round shipping requiring ice-breaking could lead to the displacement of Polar Bears from marine foraging habitat, and may negatively affect Polar Bear prey species (i.e. seal species) (Blix and Lentfer 1992; Slavik 2010, 2013; Canadian Wildlife Service 2009). Ice-breaking in the Northwest Passage would enable arctic shipping routes to open by mid-century and container ship traffic would likely increase as a result (COSEWIC 2018; Smith and Stephenson 2013).

For more information on polar bears and transportation and service corridors, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Human Intrusions and Disturbance (IUCN/CMP Threat # 6.1 – Recreational Activities; IUCN/CMP Threat # 6.3 – Work & Other activities):

The impacts of tourism on Polar Bears are largely unknown (Prestrud and Stirling 1994; Dyck and Baydack 2004; Lemelin 2006; Andersen and Aars 2008). In one study, managers, tour operators, community members, and scientists who were interviewed expressed a general consensus that <10% of the Polar Bear population in Canada is exposed to most types of recreation, including tourism (Rode et al. 2018), though this is an approximation. Polar Bear viewing tourism occurs in Manitoba, Nunavut, Northwest Territories, Ontario, the Nunavik Marine Region, the Eeyou Marine Region, and Labrador (COSEWIC 2018), though concerns exist that viewing bears in the wild displaces them from terrestrial and sea ice habitats and may cause habituation that will create changes in behaviour leading to more human-bear conflict (Tetlich et al. 2004; Nirlungayuk and Lee 2009). Increased interaction between humans and Polar Bear is already occurring in northern communities (Government of Nunavut 2018). Further human-bear conflicts may arise in the future as anthropogenic activities, such as tourism, increase. Human-bear conflicts have resulted in the destruction of property, danger to

humans, danger to bears due to human-caused harassment, and bear mortality in defense of life or property (Government of Nunavut, 2018).

As cruise ship traffic and interest in visiting Polar Bear dens (particularly in the Churchill, Manitoba area) increases, there is a growing need for more research on the impact(s) of human intrusions and disturbance on Polar Bears.

For more information on polar bears and human intrusions and disturbance, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Unknown Threat Categories:

Invasive and Other Problematic Species and Genes (IUCN/CMP Threat # 8.1 – Invasive Non-Native/Alien Species/Diseases):

As climate change causes warming temperatures, and shifts in the distribution of some species, novel pathogens (i.e. pathogens that do not traditionally occur in a given area) may enter the arctic ecosystem (Burek et al. 2008; Kutz et al. 2013), where Polar Bears may come into contact with them. Recent research suggests that several pathogens are already increasing in prevalence at the southern limit of the Polar Bears range (Pilfold et al. 2021). Further, existing pathogens, which have not caused substantial challenges for Polar Bears in the past, could become a significant mortality factor for Polar Bears, or they may reduce productivity on individual bears that are physiologically stressed (Patyk et al. 2015). This threat should be further investigated, as its impact on Polar Bears is unknown, though some research suggests that Polar Bears may have a relatively low immunity to pathogens because they have evolved in a harsh environment that limits parasite richness (Weber et al. 2013).

An increase in some native species, such as Brown Bears, onto sea ice habitat due to climate change may threaten Polar Bears due to increased interspecific conflict between the species (Joint Secretariat 2015; Miller et al. 2015).

For more information on polar bears and invasive and other problematic species and genes, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

Natural System Modifications (IUCN/CMP Threat # 7.3 – Other Ecosystem Modifications):

While there are many unknowns regarding the impacts of natural system modifications on Polar Bears, concerns exist regarding potential biotic and abiotic ecosystem changes. Some examples of potential biotic changes include alterations in Polar Bears' prey dynamics and prey

capture rates due to sea ice changes (Derocher et al. 2004), population-level impacts on seals resulting from commercial fisheries (DeMaster et al. 2001), or indirectly through decreased availability of ringed seals as prey (Bradley et al. 2005; Cattet et al. 2004), a potential increase in seal predation by Orcas (COSEWIC 2018), and an increase in Bowhead Whale carcass availability to Polar Bears as a result of increasing Bowhead Whale predation by Orcas (Galicía et al. 2016).

Two examples of potential abiotic changes include ecosystem changes resulting from altered fresh water inputs from Hudson Bay dams (Barber 2015), and altered water flows (impacts of water diversion) affecting freeze-up in Southern Hudson Bay (COSEWIC 2018). Some concern also exists in regards to the threat of future hydro development projects in Labrador (COSEWIC 2018). Hydro dams can release freshwater onto sea ice, and this may lead to various changes in sea ice dynamics with potential negative implications for Polar Bears (Laforest et al. 2018; NMRWB 2018). The threat to Polar Bears is not the construction of the dams, but the impact that freshwater outputs from the dams can have on sea ice.

More research is needed to clarify the severity of Natural System Modifications as a threat to Polar Bears.

For more information on polar bears and natural system modifications, please refer to the jurisdictional Management Plans and Recovery Strategies in parts 2 – 7 of this Management Plan.

5. Management Objective

The management objective for Polar Bear is to maintain the resilience, redundancy and representation of the population in the species' known range in Canada.

The above management objective pertains to the single Polar Bear Designatable Unit in Canada, as defined by COSEWIC. The management objective recognizes the ecological and cultural importance of the Polar Bear in Canada. Achieving this management objective will help ensure that the species meets its life history¹³ requirements and will help provide sustainable harvest opportunities to current and future generations of Indigenous rights holders.

Resilience, as used in the above management objective, is the ability of a species to recover after a perturbation. In order to ensure the resilience of the Canadian Polar Bear population, sufficient genetic diversity, health, and subpopulation abundance above minimum viability thresholds must be maintained such that the Canadian Polar Bear population is resilient enough to be able to withstand catastrophic events (e.g. new diseases, natural disasters, etc.), rebound from disturbance, and Indigenous rights holders continue to have harvest opportunities. If the

¹³ A species' life history is its pattern of survival and reproduction, along with the traits that directly affect survival and the timing or amount of reproduction (Fox and Messina 2013).

Canadian Polar Bear population maintains resilience, it will be more capable of rebounding from disturbance or perturbations (such as over harvest, oil spills, a disease outbreak, etc.).

Redundance, as used in the above management objective, is the presence of multiple and widespread subpopulations of a species that enables the species' long-term persistence in the face of ecological and environmental change occurring in specific locations. On the national and international scale, the Canadian Polar Bear population is managed as a single Designatable Unit. On the jurisdictional scale, Polar Bear is managed on the basis of the 14 subpopulations that occur across seven provinces and territories in Canada. The species is more likely to persist over the long term if all 14 subpopulations persist.

Representation, as used in the above management objective, refers to the occurrence of Polar Bear in a range of ecosystem types (refer to section 3 for more information about ecosystem types), the extent of genetic diversity that the species possesses, and the species' overall ability to withstand environmental change. Maintaining Polar Bears across their present range in these habitats is a vital component of ensuring sufficient representation. There are some unknowns regarding how sea ice conditions will change across the Canadian Arctic, and the capacity of Polar Bears to adapt over time; see section 4.2 Description of Threats (Climate Change and Severe Weather (IUCN/CMP Threat # 11.1 – Habitat Shifting and Alteration) for additional information .

Polar Bear management objectives for each of the 14 subpopulations, which have been identified by the relevant jurisdictional authorities, are described in Parts 2-7 of this document.

6. Broad Strategies and Management Actions

6.1 Actions Already Completed or Currently Underway

Conservation and Management of the Polar Bear and its habitat in Canada:

In 2011, Environment and Climate Change Canada worked closely with the PBAC to publish the National Polar Bear Conservation Strategy for Canada. This strategy was developed by the PBAC and its purpose was to guide Polar Bear co-management activities by partners across Canada, including federal, provincial and territorial governments, Wildlife Management Boards/Advisory Councils, and Indigenous organizations. It contains over-arching objectives aimed at promoting coordination and providing guidance for Polar Bear management and conservation of actions across jurisdictions, and with co-management partners within Canada. There are also a series of annexes that provide an overview of how Canada's Polar Bear co-management partners manage key conservation threats and challenges. The strategy was completed before the Polar Bear was listed as a species of special concern under the SARA, and was not intended to fulfill the legislative requirement for a Management Plan.

The PBAC provides a forum for provincial, territorial and federal governments, as well as Indigenous organizations and Wildlife Management Boards/Advisory Councils, to work together to manage Polar Bears in Canada (Lunn et al. 2002), and to ensure that Canada fulfills its obligations to the *Agreement on the Conservation of Polar Bears* (1973). In particular, the PBAC provides input, advice and recommendations to the relevant management authorities regarding research, monitoring, and management requirements and initiatives, to help ensure the conservation and management of Polar Bears in Canada, as well as to help facilitate cooperation and coordination between jurisdictions in Canada. The Polar Bear Technical Committee (PBTC) provides a forum for technical experts to share and discuss information and advice among themselves. That information and advice is then reported back to the PBAC. In particular, the PBTC supports the PBAC by reviewing scientific research and Indigenous Knowledge and providing an annual status assessment of the 14 Polar Bear subpopulations in Canada. The status assessment is updated when new information about one or more subpopulations becomes available. The PBTC includes representatives from each jurisdiction in Canada where Polar Bears are found, as well as representatives from Wildlife Management Boards or Advisory Councils and Land Claim organizations. The information provided in the PBTC's annual status assessment table helps facilitate the adaptive management of Polar Bear in Canada by providing management authorities with the latest information related to the status of Canada's Polar Bear subpopulations.

Climate change is the largest threat facing Polar Bears (COSEWIC 2018), and Canada is undertaking several initiatives to address the impacts of climate change (ECCC 2016). For example, Environment and Climate Change Canada worked collaboratively with provinces and territories to develop the Pan-Canadian Framework on Clean Growth and Climate Change, which was published in 2016 and can be accessed at: <http://publications.gc.ca/site/eng/9.828774/publication.html>. The framework's goal is to enable Canada to meet its 2030 target for reducing emissions as agreed to in the Paris Agreement during the 2015 United Nations Framework Convention on Climate Change. In April 2021, Canada updated its emissions reduction target under the Paris Agreement on climate change to 40-45% below 2005 levels, by 2030 (Office of the Prime Minister, 2021). Future work is required to implement the measures to reduce greenhouse gas emissions as specified in the Pan-Canadian Framework on Clean Growth and Climate Change (ECCC 2016). In addition, Environment and Climate Change Canada provides support to Indigenous partners to implement climate change strategies, such as the National Inuit Climate Change Strategy (ECCC 2019b). Most of Canada's provinces and territories have also produced climate change strategies. More information is available on provincial and territorial websites. Total Allowable Harvest levels are in place throughout Nunavut, the Inuvialuit Settlement Region (Yukon and Northwest Territories) and Nunatsiavut (Newfoundland and Labrador). In the aforementioned areas, Canada has concluded modern treaty agreements, and removal levels are determined or recommended by Wildlife Management Boards or Advisory Councils. Wildlife Management Board and Advisory Council decisions and recommendations are generally given effect by provincial and territorial government authorities, who accept, reject or vary the decisions/recommendations, and implement them using provincial and territorial legislation. Within the Nunavik Marine Region and an overlap area between the Nunavik

Marine Region and Eeyou Marine Region (offshore from Québec), a harvest quota has been established by the Government of Canada and the Government of Nunavut for the Southern Hudson Bay subpopulation. The management of Polar Bears harvested onshore in Ontario, Manitoba and Québec falls under provincial jurisdiction. Harvest management systems within Canada's subnational jurisdictions are further described in Parts 2 – 7 of this Management Plan, where applicable.

In 1991, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC; formerly Indian and Northern Affairs Canada) established the Northern Contaminants Program (NCP) in response to concerns about human exposure to elevated levels of contaminants in wildlife species (such as the Polar Bear) that are important to the traditional diets of northern Indigenous peoples (Government of Canada 2019). The NCP, in collaboration with regional health authorities, regularly reports information about contaminants so consumers of traditional/country foods can make informed decisions (Government of Canada 2019).

The Impact Assessment Agency of Canada (IAAC; formerly the Canadian Environmental Impact Assessment Agency) is the federal agency responsible for administering the *Impact Assessment Act* (IAA). The IAA requires that projects which may have an adverse impact on the environment undergo an environmental assessment to minimize or avoid adverse environmental effects before they occur, and incorporate environmental factors into decision making (IAA 2018). In areas where Land Claim Agreements are in place, the potential adverse impacts of proposed projects can also be assessed by Impact Review Boards (IRBs) (ECCC 2018a). IRBs are established under Land Claim Agreements and their role is to conduct environmental assessments on proposed projects in the area(s) covered by the applicable Land Claim Agreement (ECCC 2018a). Examples of projects which may impact Polar Bears and would likely require an environmental assessment may include oil and gas drilling projects, as well as mining and quarrying projects.

Transport Canada is the federal agency responsible for domestically implementing the international standards set by the International Maritime Organization (IMO) (Transport Canada 2017). For example, the *Polar Code* (an international code for the safety of and prevention of pollution from ships operating in polar waters, adopted in 2015) introduced requirements for arctic Shipping at the international level. Amongst other things, the *Polar Code* helps protect the marine environment by addressing the risks unique to polar waters not covered by other IMO instruments (International Maritime Organization, n.d.). For example, the *Polar Code* prohibits oil, noxious substances, and (with some exceptions) sewage and garbage, all of which can have a negative impact on Polar Bears and other species which are dependent upon marine environments, from being discharged into the sea (International Maritime Organization, n.d.). As well, the *Polar Code* requires that vessels that operate in polar waters have double hull construction to help prevent oil spills in case of an accident (International Maritime Organization, n.d.). The *Oceans Protection Plan* is another initiative that has been undertaken by Transport Canada to protect Polar Bear habitat. More information on the *Oceans Protection Plan* can be found in section 4.2 (Negligible Threat Categories: Energy Production and Mining) of this document.

In 2004, the Government of Canada, working closely with provincial and territorial partners, produced ‘An Invasive Alien Species Strategy for Canada’. The strategy seeks to reduce the frequency and impact of harmful species introductions through the development of early warning systems and response plans that specify eradication, containment and control procedures (ECCC 2004). In addition, in June 2018, federal, provincial and territorial governments finalized a ‘Pan-Canadian Approach to Wildlife Health’. The approach seeks to coordinate wildlife health surveillance and management programs across portfolios and levels of government, and work with key non-government partners, experts, and Indigenous rights holders, to move Canada from a reactive disease-by-disease approach to addressing wildlife health threats to a proactive regime (ECCC 2018c).

In Canada, the management of hydro development projects falls under the jurisdiction of the provinces and territories, and authorities from these jurisdictions may be contacted to obtain more information related to specific projects. However, the construction of a hydro dam is likely to be captured by federal legislation, namely the *Canadian Environmental Assessment Act*, CEAA (Government of Ontario 2017). The CEAA requires that proponents of proposed hydro development projects undertake an environmental assessment to determine what negative environmental impacts, if any, may occur once the proposed project is completed and operational (Government of Ontario 2017).

The Government of Canada is committed to continuing to establish and maintain protected areas including habitat important to Polar Bears, such as National Parks, National Marine Conservation Areas, National Wildlife Areas, Marine National Wildlife Areas, Migratory Bird Sanctuaries and Marine Protected Areas (ECCC 2018b; ECCC 2019a). Figure 2 depicts federal and non-federal protected areas within the Canadian Polar Bear distribution range. In National Parks such as Sirmilik National Park and Ukkusiksalik National Park, Parks Canada has taken measures to effectively manage access to Polar Bear dens during key periods by establishing zoning measures (Parks Canada 2018b). Marine Protected Areas in Canada are protected from mining, oil and gas extraction, dumping, and trawling (Jessen et al. n.d.). In August 2019, the Government of Canada announced the establishment of a memorandum of understanding between the Government of Canada, the Government of Nunavut and the Qikiqtani Inuit Association to support the advancement of marine protection in Tuvaijuittuq. The Tuvaijuittuq Marine Protected Area is Canada’s largest Marine Protected Area and is a significant contribution towards surpassing Canada’s goal of protecting 10% of its marine areas by 2020.

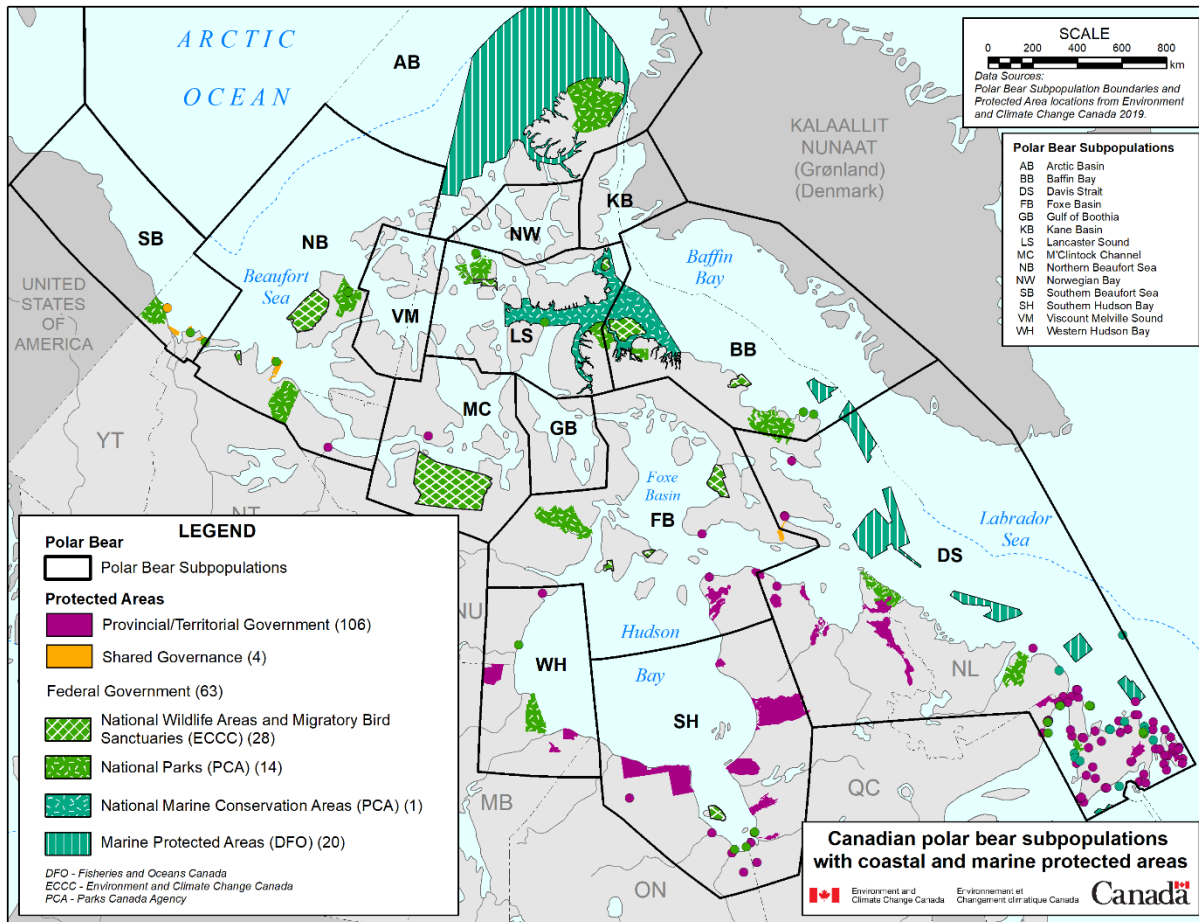


Figure 2: Protected areas within Canadian Polar Bear subpopulations (source: ECCC 2018b). The dotted line surrounding Canada represents the exclusive economic zone.

International Cooperation

As a signatory to the *Agreement on the Conservation of Polar Bears* (1973), Canada works with other Range States (Greenland, Norway, Russia, and the United States) to protect Polar Bears and their habitats. In 2015, the Range States produced the Circumpolar Action Plan, which is a Conservation Strategy for the Polar Bear throughout the circumpolar arctic. The Circumpolar Action Plan states that the Range States will identify best practices to ensure the long-term persistence of Polar Bear by taking action to mitigate threats such as climate change, while continuing to provide sustainable harvest opportunities for Indigenous rights' holders (Polar Bear Range States 2015). In particular, the Range States (including Canada) will share, develop and implement Best Management Practices (BMPs) to help address threats to Polar Bears from natural resource development, contaminants, tourism, shipping and interactions with humans (Polar Bear Range States 2015).

In the case of Polar Bear subpopulations that are shared between Canada and international co-management partners, international agreements such as Memoranda of Understanding (MoUs)

or user-to-user arrangements have been developed in accordance with Land Claim Agreements and respective of jurisdictional protocols or interjurisdictional agreements. Such agreements act as mechanisms to reach concurrence on management objectives, Total Allowable Harvest, and shared harvest allocation. Existing agreements include the Inuvialuit-Iñupiat Agreement for the shared Southern Beaufort Sea subpopulation – originally signed in 1988; the MoU between Canada and the United States for the shared Southern Beaufort Sea subpopulation – 2008; and the MoU between Greenland, Nunavut and Canada for the shared Kane Basin and Baffin Bay subpopulations – 2009.

Canada is a signatory to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (Government of Canada 2018). CITES aims to ensure that international trade of listed species does not threaten their survival. Under CITES, Polar Bears have been listed on Appendix II since the inception of the convention in 1975 and international trade of the species is tracked. A permit for export of Polar Bear from Canada is only issued if the Polar Bear (including any Polar Bear part) has been legally obtained and only if advice from the CITES Scientific Authority in Canada indicates that the trade will not be detrimental to the survival of the species. This advice is termed a non-detriment finding or NDF (Government of Canada 2017a). Considerations for making the non-detriment finding include the biology, conservation status, trade levels and harvest management of the species, and this information is publicly available on the [Government of Canada website](https://www.canada.ca/en/environment-climate-change/services/convention-international-trade-endangered-species/non-detriment-findings/polar-bear.html)¹⁴. In Canada, CITES is implemented through the Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRITA) by Environment and Climate Change Canada (Government of Canada 2017b).

The Stockholm Convention on Persistent Organic Pollutants (POPs) was signed and ratified by Canada in 2001 (ECCC 2017). Its goal is to reduce levels of POPs entering the environment over time; as a result of eliminating or restricting releases of POP industrial chemicals and pesticides, unintentionally produced POP by-products and stockpiles and wastes of POPs (ECCC 2017). Canada occasionally makes documented submissions to suggest the regulation of emerging and/or priority POPs through their addition to Annex A, B or C of the Stockholm Convention (R. Letcher, pers. comm.).

In Canada, legislation regulating tourism falls under the jurisdictions of the provinces and territories. However, the Circumpolar Action Plan calls for the Range States to “collect occurrence data, and develop BMPs, with the goal of balancing needs of tourism-related activities and their impact on Polar Bears” (Polar Bear Range States 2015: page 59).

Scientific and Indigenous Knowledge Monitoring and Research

Collaboration on research and monitoring initiatives between the federal Government and partners is essential for the conservation and management of Polar Bears in Canada. The

¹⁴ <https://www.canada.ca/en/environment-climate-change/services/convention-international-trade-endangered-species/non-detriment-findings/polar-bear.html>

partners (including Wildlife Management Boards, Advisory Councils, and federal, provincial and territorial governments) involved in Polar Bear management in each Canadian subpopulation are listed in Table 3 in section 3.2 of this document. Environment and Climate Change Canada works closely with partners to determine research priorities which will help inform effective Polar Bear conservation and management in Canada (Government of Canada 2009). Canada's partners each have one or more specific focuses, such as ensuring sustainable harvest levels, harvest monitoring, and furthering understanding of Polar Bear demography, ecology, status, and health.

Federal research forms part of Canada's broad commitments under the international *Agreement on the Conservation of Polar Bears* (1973). To meet commitments made under the *Convention on Biological Diversity* (1992), CITES, and Canada's *Species at Risk Act* (2002), both scientific and Indigenous Knowledge must be given thorough consideration when decisions are made relating to the long-term conservation of Polar Bears, including protection from overexploitation from international trade. Federal research focuses on broad ecological questions applicable to Polar Bears across the circumpolar arctic. Targeted research enhances scientific knowledge and mobilizes Indigenous Knowledge of population dynamics, Polar Bear health, and threat assessments, and furthers understanding of barriers to potential recovery while aiding in the development and implementation of effective conservation actions. This information is then used by jurisdictions and committees (such as COSEWIC and the PBTC) who regularly assess the status of Polar Bears in Canada.

Environment and Climate Change Canada's research focus includes furthering understanding of Polar Bear ecology and arctic marine ecosystems, contributing to assessments of Polar Bear subpopulation abundance and trend, and understanding relationships between Polar Bears, prey, and sea ice. Currently, Environment and Climate Change Canada has five primary scientific and Indigenous Knowledge research priorities, as outlined in Table 5, below. The Department recognizes the importance of both scientific and Indigenous Knowledge in Polar Bear research and monitoring and is committed to inclusion and partnerships with Indigenous organizations and communities. Each of the five research priorities includes ongoing engagement and knowledge exchange with northern communities, Indigenous organizations, and co-management partners. Jurisdictional research priorities are further expanded in Sections 2-7 of the Management Plan.

Table 5: Environment and Climate Change Canada's research priorities for Polar Bear

Research Priority	Description	Examples of Ongoing Research
Habitat and climate change	Understanding links among changes in climate, sea ice habitat, Polar Bear behaviour, body	<ul style="list-style-type: none">Long-term research to evaluate the impacts of climate change on ecology, population dynamics, and status of Polar BearsResearch linking Polar Bear and ringed seal population dynamics

Research Priority	Description	Examples of Ongoing Research
	condition and population status	<ul style="list-style-type: none"> Ecological studies of Polar Bears on multiyear sea ice Ecology and movement of Polar Bears Long-term monitoring of trends in declining sea ice habitat
Population assessment	Development of potential new field and statistical methodologies to assess Polar Bear population demography	<ul style="list-style-type: none"> Development of integrated population models incorporating harvest information, individual movements and Indigenous Knowledge Co-production of scientific and Indigenous Knowledge to assess Polar Bear health and status
Genetics and health	Research into population genetics and Polar Bear health	<ul style="list-style-type: none"> Measuring Polar Bear health through analysis of various biological metrics Information related to Polar Bear health and body condition, such as the presence of plastics, is gathered from harvesters and Indigenous Knowledge holders Studies of disease prevalence in Polar Bears Assessing body condition using biological metrics Monitoring and surveillance of pollutants and heavy metals in fat and liver tissues to monitor polar bear health and contaminant trends. Assessment of population genetics and unique genetic variation to inform Designatable Units Assessing the role of genetic diversity in polar bear fitness and the adaptive potential of the species.
Foraging ecology and ecosystem dynamics	Polar Bear foraging ecology in relation to prey dynamics in marine and terrestrial environments	<ul style="list-style-type: none"> Using new technologies to study the impact of Polar Bear predation of ancillary prey species Understanding prey dynamics, ecosystem function and energetics

Research Priority	Description	Examples of Ongoing Research
Indigenous Knowledge and local perspectives of Polar Bears, seals, and arctic marine ecosystems	Engagement with Indigenous partners in Polar Bear research and monitoring	<ul style="list-style-type: none"> Documenting Indigenous Knowledge about Polar Bear abundance, distribution, health and habitat in the Davis Strait subpopulation Ongoing engagement and knowledge exchange with northern communities, Indigenous organizations, and co-management partners

1081

1082 Many of the ongoing research initiatives listed above are done in collaboration with regional
1083 jurisdictions and international partners.

1084 Table 5 (above) focuses on Environment and Climate Change Canada's scientific and Indigenous
1085 Knowledge research and monitoring priorities. Specific information pertaining to scientific and
1086 Indigenous Knowledge monitoring and research initiatives related to Polar Bears at the regional
1087 level can be found in Parts 2 – 7 of this Management Plan.

1088

1089 **Public Outreach and Education**

1090 Environment and Climate Change Canada maintains a webpage for members of the public to
1091 learn about the initiatives which are being undertaken by the Government of Canada to
1092 manage and conserve Polar Bears in Canada. In particular, this webpage addresses Polar Bears
1093 and CITES, the specific management and conservation actions being taken by the Government
1094 of Canada at the national and international level, actions being taken to address the impacts of
1095 climate change, and scientific and Indigenous Knowledge research initiatives related to Polar
1096 Bears. The webpage can be accessed [here](#)¹⁵.

1097

1098 Environment and Climate Change Canada works closely with the Government of Nunavut to
1099 maintain the [PBAC website](#)¹⁶. The purpose of this website is to share information pertaining to:
1100 PBAC and PBTC; Polar Bear biology; Canada's Polar Bear subpopulations; the cultural
1101 significance and economic importance of Polar Bears to Indigenous peoples; provincial,
1102 territorial, federal, and international legislation related to Polar Bears; national and
1103 international Polar Bear management and harvest initiatives; and scientific and Indigenous
1104 Knowledge research initiatives related to Polar Bears. This website provides contact
1105 information for members of the public to contact the Environment and Climate Change Canada
1106 PBAC Secretariat for further information.

¹⁵ <https://www.canada.ca/en/services/environment/wildlife-plants-species/wildlife-habitat-conservation/conservation-polar-bears.html>

¹⁶ <https://www.polarbearsCanada.ca/>

The [National Polar Bear Conservation Strategy for Canada¹⁷](#) (hereafter, ‘the Strategy’) was collaboratively developed and published by PBAC in 2011. As an active member of PBAC, Environment and Climate Change Canada played a key role in the finalization of the Strategy. The Strategy is available to members of the public and it provides information pertaining to the roles and responsibilities of all Polar Bear co-management partners in Canada, and it discusses the key threats that Polar Bears face in Canada. Annex I of the Strategy discusses the monitoring of Polar Bears and their habitat, and contains guidelines to help ensure coordinated timelines, and monitoring and sampling protocols for baseline monitoring that use both scientific and traditional user knowledge. Annex II of the Strategy discusses harvest management, and contains guidelines aimed improving the overall coordination of harvest management in Canada. The main principles of those guidelines are embedded within the broad strategies and management actions discussed in this document.

Through funding programs such as the Aboriginal Fund for Species at Risk (AFSAR), Environment and Climate Change Canada has supported projects aimed at increasing knowledge about Polar Bears and their habitat, as well as addressing human and Polar Bear safety in areas where conflicts may occur. Activities implemented under such projects include Indigenous communities hosting bear safety workshops to provide training on how to mitigate human-Polar Bear conflicts.

Several Canadian jurisdictions have public outreach and education initiatives in place which provide information related to Polar Bear. For more information pertaining to these initiatives, please refer to Parts 2 – 7 of this Management Plan.

Information pertaining to broad strategies, including actions that are completed or currently underway, for Polar Bear conservation and management at the regional level can be found in the jurisdictional recovery strategies and management plans (Parts 2 – 7 of this Management Plan).

6.2 Broad Strategies

The primary threat to Polar Bears is habitat loss resulting from climate change (Tynan and DeMaster 1997; Derocher et al. 2004; Laidre et al. 2008; Kovacs et al. 2010; IPCC 2013). While other factors have been assessed by COSEWIC as low or negligible threats, cumulative impacts and interacting relationships between threats may be a potential concern, though knowledge surrounding the impacts of cumulative effects is generally lacking (Vongraven and Richardson 2011). Managing these threats will require the commitment of various levels of government, Indigenous partners, stakeholders, conservation organizations and the public, and cannot be achieved by Environment and Climate Change Canada alone. To achieve the federal

¹⁷ <https://www.polarbearagreement.org/resources/individual-range-state-action-plans/canada/national-polar-bear-conservation-strategy-english>

management plan objectives, the following federal broad strategies are recommended and are intended to serve as guidance to the jurisdictions and authorities responsible for the management of Polar Bear in Canada:

- Work closely with Indigenous partners, governments, and stakeholders to co-manage and conserve the Polar Bear and its habitat in Canada
- Support international cooperation for management of the Polar Bear and its habitat throughout the entirety of its range
- Conduct scientific and Indigenous Knowledge research and monitoring initiatives in Canada and support international initiatives to address knowledge gaps regarding Polar Bears
- Promote and support public outreach and education on matters related to Polar Bear management and conservation in Canada

Information pertaining to broad strategies for Polar Bear conservation and management at the regional level can be found in the jurisdictional recovery strategies and management plans (Parts 2 – 7 of this Management Plan).

6.3 Conservation Measures

The following table outlines the conservation measures that are recommended to achieve the overall federal management plan objective, and gives a timeline for their implementation. Conservation measures are organized by the four broad strategies: co-manage and conserve Polar Bears in Canada; support international cooperation; scientific and Indigenous Knowledge research and monitoring; and public outreach and education. Specific information pertaining to conservation measures related to Polar Bears at the regional level can be found in the jurisdictional Management Plans and Recovery Strategies (Parts 2 – 7 of this Management Plan). This section focuses on matters under federal jurisdiction.

Table 6. Conservation Measures and Implementation Schedule

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
Co-manage and conserve Polar Bears in Canada	1.1 Work closely with domestic partners through such forums as the Polar Bear Administrative Committee (PBAC) and the Polar Bear Technical Committee (PBTC) to support the development and	High	All threats	Ongoing

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
	communication of policy, programs and guidelines that manage threats and conserve and enhance Polar Bears and their habitat, particularly in areas subject to habitat loss due to climate change			
Co-manage and conserve Polar Bears in Canada	1.2 Review new and updated science and Indigenous Knowledge information on a regular basis to inform management and conservation decisions and actions	High	All threats	Ongoing
Co-manage and conserve Polar Bears in Canada	1.3 Support jurisdictions and co-management partners in working with Indigenous and local northern communities to reduce and monitor Polar Bear-human conflict. Conservation actions will be informed by Land Claims Agreements (where applicable) and may include local and regional initiatives (e.g., managing human-bear conflict, Guardian and monitoring programs, gathering Indigenous Knowledge) up to the national scale (e.g., participation in national conservation and species assessment initiatives).	High	Human intrusions and disturbance (IUCN/CMP Threat #6)	Ongoing
Co-manage and conserve Polar Bears in Canada	1.4 Support jurisdictions and co-management partners in working with Indigenous and local northern	High	Biological resource use (IUCN/CMP Threat #5)	Ongoing

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
	communities to ensure a sustainable harvest of Polar Bear that follows conservation principles. Conservation actions will be informed by Land Claims Agreements (where applicable) and may include local and regional initiatives (e.g., harvest management, Guardian and monitoring programs, gathering Indigenous Knowledge) up to the national scale (e.g., participation in national conservation and species assessment initiatives).			
Co-manage and conserve Polar Bears in Canada	1.5 Work closely with Indigenous, governmental, and industry partners to minimize the negative effects of human activities on Polar Bears and Polar Bear habitat	Medium	All threats	Ongoing
Co-manage and conserve Polar Bears in Canada	1.6 Promote public engagement in matters related to public safety by encouraging participation in provincial/territorial government wildlife deterrence programs to reduce the risk to human life by Polar Bears, reduce destruction of property by wildlife, and reduce and monitor the number of Polar Bears killed in defence of life and property	High	Biological resource use (IUCN/CMP Threat #5) Human intrusions and disturbance (IUCN/CMP Threat #6)	Ongoing

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
Co-manage and conserve Polar Bears in Canada	1.7 Ensure that jurisdictional management framework (including co-management regimes, federal, provincial and territorial legislation, land claim agreements, and inter-jurisdictional agreement(s) are followed	High	All threats	Ongoing
Support international cooperation	2.1 Support and participate in international Polar Bear conservation, research and monitoring initiatives (e.g. the implementation of the <i>Agreement on the Conservation of Polar Bears</i> (1973), Circumpolar Action Plan (2015 – 2025), etc.) with the goal of managing and conserving Polar Bear and its habitat throughout the species' range	High-Medium	All threats	Ongoing
Support international cooperation	2.2 Continue to regulate international trade of Polar Bears and Polar Bear products, in accordance with obligations as a signatory party to CITES	High-Medium	Biological resource use (IUCN/CMP Threat #5)	Ongoing
Scientific and Indigenous Knowledge, research and monitoring	3.1 Support scientific and Indigenous Knowledge research, and community-based monitoring projects that improve our understanding of Polar Bear distribution, abundance, and subpopulation trends within Canada to allow for	High – Medium	All threats	Ongoing

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
	targeted conservation efforts			
Scientific and Indigenous Knowledge, research and monitoring	3.2 Monitor the presence and investigate the impacts of contaminants and plastics on Polar Bears	Medium – Low	Pollution (IUCN/CMP Threat #9) Energy production and mining (IUCN/CMP Threat #3)	Ongoing
Scientific and Indigenous Knowledge, research and monitoring	3.3 Use scientific and Indigenous knowledge to understand links between changes in climate, sea ice habitat, Polar Bear behaviour, body condition and population status	High	Climate change and severe weather (IUCN/CMP Threat #11)	Ongoing
Scientific and Indigenous Knowledge, research and monitoring	3.4 Conduct research into population genetics and Polar Bear health	Medium	All threats	Ongoing
Scientific and Indigenous Knowledge, research and monitoring	3.5 Conduct research focusing on Polar Bear foraging ecology in relation to prey dynamics in marine and terrestrial environments	Medium	Climate change and severe weather (IUCN/CMP Threat #11)	Ongoing
Public outreach and education	4.1 Promote the sharing of science and Indigenous Knowledge (including the importance of Polar Bears to Indigenous peoples, and the impacts of climate change on Polar Bears) with the Canadian public,	High	All threats	Ongoing

Broad Strategy	Conservation Measure	Priority ^e	Threats or Concerns Addressed	Timeline
	international audiences, and decision makers			
Public outreach and education	4.2 Support and extend current conservation efforts in protected areas in Canada through the promotion of Polar Bear conservation and stewardship programs	Medium	All threats	Ongoing
Public outreach and education	4.3 Support the development and implementation of education, outreach and public engagement activities related to Polar Bear conservation and stewardship	Medium	All threats	Ongoing

^e "Priority" reflects the degree to which the measure contributes directly to the conservation of the species or is an essential precursor to a measure that contributes to the conservation of the species. High priority measures are considered those most likely to have an immediate and/or direct influence on attaining the management objective for the species. Medium priority measures may have a less immediate or less direct influence on reaching the management objective, but are still important for the management of the population. Low priority conservation measures will likely have an indirect or gradual influence on reaching the management objective, but are considered important contributions to the knowledge base and/or public involvement and acceptance of the species.

7. Measuring Progress

Every five years, success in implementing the management plan and progress towards achieving the management plan objective will be measured against the following performance indicators:

- Resilience has been maintained in the Canadian Polar Bear population: The health and genetic diversity of the Canadian population, and subpopulation abundance above minimum viability thresholds, has been maintained such that the Canadian Polar Bear population has enough resilience to be able to withstand catastrophic events, rebound from disturbance, and persist over the long term; thereby ensuring the species' resilience in Canada. This resilience has helped to ensure that harvesting by Indigenous rights holders has remained sustainable.
- Redundance has been maintained in the Canadian Polar Bear population: The 14 widespread Polar Bear subpopulations have continued to persist over the long-term

across the Canadian jurisdictions where Polar Bears currently occur, despite ecological and environmental change; thereby ensuring the species' redundancy in Canada

- Representation has been maintained in the Canadian Polar Bear population: Polar Bears continue to occur in a range of ecosystem types, have maintained their current level of genetic diversity, and have maintained the ability to withstand environmental change; thereby ensuring the species' representation in Canada

8. Effects on the environment and other species

A strategic environmental assessment (SEA) is conducted on all SARA recovery planning documents, in accordance with the [Cabinet Directive on the Environmental Assessment of Policy, Plan and Program Proposals](#)¹⁸. The purpose of a SEA is to incorporate environmental considerations into the development of public policies, plans, and program proposals to support environmentally sound decision-making and to evaluate whether the outcomes of a recovery planning document could affect any component of the environment or any of the [Federal Sustainable Development Strategy](#)¹⁹ (FSDS)'s goals and targets.

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

The potential for the management plan to inadvertently lead to adverse effects on the environment or other species was considered. Since the focus of recommended activities is primarily on non-intrusive measures such as working with domestic and international partners, conducting scientific and Indigenous Knowledge research and monitoring initiatives, and promoting and supporting public outreach and education, it is unlikely that the management plan will entail significant adverse effects for the environment or other species.

Support and cooperation among domestic and international partners to manage and conserve the habitat of Polar Bear (*Ursus maritimus*) throughout its range may benefit species that utilize sea ice habitat, such as Ringed (*Pusa hispida*), Bearded (*Erignathus barbatus*) and Harp (*Phoca Groenlandica*) Seals, Walrus (*Odobenus rosmarus*), Beluga (*Delphinapterus leucas*), Narwhal (*Monodon monoceros*), Arctic Fox (*Vulpes lagopus*), and others. Narwhals, for example, are also directly impacted by climate change, as melting sea ice may alter their migratory routes, could

¹⁸ <http://www.ceaa.gc.ca/default.asp?lang=En&n=B3186435-1>

¹⁹ <http://www.ec.gc.ca/dd-sd/default.asp?lang=En&n=F93CD795-1>

lead to the introduction of new predators, and may increase noise pollution from shipping and development. Therefore, Narwhals would likely benefit from the management and conservation of arctic sea ice habitat on a domestic and international scale, as recommended by this management plan.

Other species that utilize sea ice habitat (in addition to Polar Bears) may also benefit from ongoing research that is being carried out to learn more about Polar Bears and their habitat. For example, research focusing on Polar Bear foraging ecology in relation to prey dynamics in marine and terrestrial environments will have indirect benefits on the species that Polar Bear prey on, because researchers will learn more about their life history requirements.

Public outreach and education initiatives may also benefit other species. For example, supporting and extending current conservation efforts in protected areas in Canada through the promotion of Polar Bear conservation and stewardship programs will indirectly benefit other species found in the same protected areas.

Provided conservation measures and management actions are applied, it is unlikely that the present management plan will produce any significant negative effects on the arctic environment, or the species that live there.

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Part 2: Inuvialuit Settlement Region Polar Bear Joint

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Management Plan, prepared by the Joint Secretariat Inuvialuit

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Settlement Region

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**Part 3: Nunavut Polar Bear Co-Management Plan, prepared by
the Nunavut Polar Bear Co-Management Working Group**

Part 4: Recovery Strategy for the Polar Bear (*Ursus maritimus*) in Manitoba

NOTE: The Recovery Strategy for the Polar Bear in Manitoba will be adopted as Part 4 of the National Polar Bear Management Plan once it is transmitted to Environment and Climate Change Canada.

Part 5A: Government Response Statement to the Recovery Strategy for Polar Bear, prepared by the Ontario Ministry of Natural Resources and Forestry (2016) (species-specific policy)

Note: The Government Response Statement for Polar Bear in Ontario was published in 2016 and contains references to commitments made in Ontario's Climate Change Strategy and Action Plan. Since the publication of this document, a revised provincial approach to addressing climate change has been proposed in the Made-in-Ontario Environment Plan.

Part 5B: Recovery Strategy for Polar Bear (*Ursus maritimus*) in Ontario, prepared by M.B. Tonge and T.L. Pulfer (2011) (technical advice)

**Part 6: Management Plan for the Polar Bear (*Ursus maritimus*)
for Québec, the Eeyou Marine Region, and the Nunavik
Marine Region, prepared by the Québec - Eeyou Marine
Region - Nunavik Marine Region Polar Bear Working Group**

Part 7: Management Plan for the Polar Bear (*Ursus maritimus*) in Newfoundland and Labrador

NOTE: The Management Plan for the Polar Bear in Newfoundland and Labrador will be adopted as Part 7 of the National Polar Bear Management Plan once it is transmitted to Environment and Climate Change Canada.