Polar Bear Management Plan for Québec, the Eeyou Marine Region and the Nunavik Marine Region

2023-2033

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Management Plan cover photo courtesy of Adamie Delisle-Alaku

Acknowledgements

I would like to acknowledge the support and effort of everyone involved in the creation of this plan and all members of the Québec-Eeyou Marine Region-Nunavik Marine Region Polar Bear Working Group, who spent many hours drafting and reviewing each successive version.

I would especially like to thank all of the Cree and Inuit communities and individuals who participated in all aspects of the consultations for this plan, and who provided invaluable input that made this plan possible.

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Gregor Gilbert
Chair, Québec-Eeyou Marine Region-Nunavik Marine Region Polar Bear Working Group

The Polar Bear Management Plan for Québec, the Eeyou Marine Region, and the Nunavik Marine Region is dedicated to the memory of Mark O'Connor, whose vision, hard work, and perseverance enabled the plan to be realized.

This management plan is the result of a collaborative approach involving representation from each of the following groups:

- Canadian Wildlife Service (CWS), Environment and Climate Change Canada (ECCC)
- Cree Nation Government (CNG)
- Cree Trappers Association (CTA)
- Eeyou Marine Region Wildlife Board (EMRWB)
- Government of Nunavut Department of the Environment (GNDoE)
- Hunting Fishing Trapping Coordinating Committee (HFTCC)
- Makivik Corporation
- Ministère des Forêts, de la Faune et des Parcs (MFFP)
- Nunavik Hunters, Fishermen & Trappers Association / Regional Nunavimmi Umajulirijiit Katujjiqatigiinninga (NHFTA/RNUK)
- Nunavik Marine Region Wildlife Board (NMRWB)

Each of the organizations noted above has appointed representatives to a working group tasked with the creation of this polar bear management plan. Representatives were appointed in their capacity as experts in the field of polar bears or polar bear management, and not in the capacity of representing the views or opinions of their organizations. Consultations were undertaken throughout the region affected by the management plan, and we have endeavoured to make sure all relevant stakeholders have had an opportunity to provide input into the plan. To the extent possible, we have attempted to ensure that Inuit, Cree and scientific perspectives have been reflected appropriately throughout the development of this management Plan.

Plan Duration and Review

The Polar Bear Management Plan for Québec, the Eeyou Marine Region and Nunavik Marine Region will be in effect for a period of 10 years, subject to ongoing monitoring of its effectiveness and a full review and assessment report will be prepared after 5-years. Changes to the management plan may be proposed prior to its expiration should issues be identified in the course of these assessments.

Prior to the end of this 10-year period, a new management plan will be tabled for adoption in accordance with applicable Land Claims Agreements, and all relevant laws and regulations in force at the federal, provincial, and territorial governments. This management plan will remain in effect until a new management plan has been adopted.

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

Acronyms Used

AEUO	Areas of Equal Use and Occupancy
CAP	Circumpolar Action Plan for polar bear
CI	Confidence Interval
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CNG	Cree Nation Government
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
COY	Cub-of-the-Year
CTA	Cree Trappers' Association
CWS	Canadian Wildlife Service
DLP	Defense of life and property
DS	Davis Strait
ECCC	Environment and Climate Change Canada
EMR	Eeyou Marine Region
EMRLCA	Eeyou Marine Region Land Claims Agreement
EMRWB	Eeyou Marine Region Wildlife Board
FB	Foxe Basin
JBNQA	James Bay and Northern Québec Agreement
HFTA	Hunting, Fishing and Trapping Associations
HFTCC	Hunting, Fishing and Trapping Coordinating Committee
IUCN	International Union for Conservation of Nature
LEMV	Loi sur les espèces menacées ou vulnérables
LNUK	Local Nunavimmi Umajulirijiit Katujjiqatigiinninga
LSA	Labrador Settlement Area
MFFP	Ministère des Forêts, de la Faune et des Parcs (Gouvernement du Québec)
NHFTA	Nunavik Hunters, Fishermen and Trappers Association
NILCA	Nunavik Inuit Land Claims Agreement
NMR	Nunavik Marine Region
NMRWB	Nunavik Marine Region Wildlife Board
NQL	Non-Quota Limitation
NSA	Nunavut Settlement Area
NWMB	Nunavut Wildlife Management Board
PBAC	Polar Bear Administrative Committee
PBTC	Polar Bear Technical Committee
POP	Persistent Organic Pollutant
RNUK	Regional Nunavimmi Umajulirijiit Katujjiqatigiinninga
SARA	Federal Species at Risk Act
SHB	Southern Hudson Bay
TAT	Total Allowable Take
TK	Traditional Knowledge
WAPPRIITA	Wild Animals and Plant Protection and Regulation of International and Interprovincial Trade Act
WAPTR	Wild Animal and Plant Trade Regulations

Glossary of Select Terms Used in this Management Plan

Best Available Information - All existing information that is pertinent to assessing the status of a wildlife species, including scientific knowledge, community knowledge, and Aboriginal Traditional Knowledge that has been subjected to appropriate quality controls and can be obtained from literature sources or from the holders of the information[1]

Collaborative management – Process by which polar bear management is achieved through close collaboration between governments, land claims organizations, Indigenous organizations and harvesters. Each party participates, subject to their roles and responsibilities as established by law or by virtue of a Land Claims Agreement, to the development of recommendations, conceptualization of management measures, implementation of the management system and the enforcement of the regulatory framework that arises from it. The success of this process rests on a regular and transparent exchange of information and on the conduct of relevant consultations. The government (federal, provincial or territorial, as the case may be) holds the ultimate authority and responsibility with regards to the management measures in place within its jurisdiction.

Defense of Life and Property (DLP) - A situation where a polar bear has come into contact with humans, their property, or both, and actions are taken to preserve the life of one or more persons or when public safety and property are at stake[2].

Harvest or Harvesting - The term is used to reflect the definitions included in each of the applicable Land Claim Agreements as follows:

> **Eeyou Marine Region Land Claims Agreement (EMRLCA)[3]**: "Harvest" or ''Harvesting'' means the reduction of Wildlife into possession, and includes hunting, trapping, fishing as defined in the Fisheries Act, R.S.C. 1985, c. F-14, netting, egging, picking, collecting, gathering, spearing, killing, capturing or taking by any means.
>
> **James Bay and Northern Québec Agreement (JBNQA)[4]:** "Harvesting" means hunting, fishing and trapping by the Native people for the purpose of the capture or killing of individuals of any species of wild fauna, except species from time to time completely protected to ensure the continued existence of that species or a population thereof, for personal and community purposes or for commercial purposes related to the fur trade and commercial fisheries.
>
> **Nunavik Inuit Land Claims Agreement (NILCA)[5]:** "harvest" means the reduction of wildlife into possession and the attempt thereto, and includes hunting, trapping, fishing, netting, egging, picking, collecting, gathering, spearing, killing, capturing or taking by any means.

Healthy population – A population that benefits from a state ofbiologic, social, and environmental determinants and their interactions that allows its maintenance. For polar bear, these determinants include nutritional condition, physiological stress, and exposure to contaminants, diseases and parasites.

Inuit Qaujimajatuqangit (IQ) - Inuit Qaujimajatuqangit encompasses all aspects of Inuit culture, including values, language, social organization, knowledge, life skills, perceptions and expectations[8,9].

Local Knowledge - A collection of facts that relates to the entire system of concepts, beliefs, and perceptions that people hold about the world around them. This includes the way people observe and measure their surroundings, how they solve problems and validate new information. It includes the

processes whereby knowledge is generated, stored, applied and transmitted to others. It is not confined to tribal groups or to the original inhabitants of an area[10].

Management system - Refers to the suite of tools that are used to implement the management framework and management plan, such as tags, quotas, etc.

Non-Quota Limitations (NQL) - A limitation of any kind, except a total allowable take (TAT), including limits imposed on the harvest season, sex, size, or age of wildlife, or the harvest methods.

Principles of Conservation - The Principles of Conservation are defined in each of the applicable Land Claim Agreements as follows:

Eeyou Marine Region Land Claims Agreement[3]:

a) the maintenance of the natural balance of ecological systems within the EMR;
b) the maintenance of vital, healthy Wildlife populations, including maintaining such populations to sustain the Harvesting needs as defined in Part III;
c) the protection of Wildlife habitat; and
d) the restoration and revitalization of depleted populations of Wildlife and Wildlife habitat.

James Bay and Northern Québec Agreement[4]:

"Conservation" means the search for the optimal natural productivity of all living resources and the protection of the ecological systems of the Territory so as to protect endangered species and to ensure primarily the continuance of the traditional pursuits of the Native people, and secondarily the satisfaction the needs of non-Native people for sport hunting and fishing.

Nunavik Inuit Land Claims Agreement[5]:

a) The maintenance of the natural balance of ecological systems within the NMR;
b) The maintenance of vital, healthy wildlife populations capable of sustaining harvesting needs as defined by the Article;
c) The protection of wildlife habitat; and
d) The restoration and revitalization of depleted populations of wildlife and wildlife habitat.

Sustainable Harvesting - A method of harvest or use of a resource in a way and at a rate that does not lead to its long-term decline, thereby maintaining its potential to meet the needs and aspirations of present and future generations[11].

Total Allowable Take (TAT) - The NILCA and the EMRLCA define TAT as the amount of a wildlife species that can be legally harvested. The JBNQA uses the term "catch limit" in the same sense (i.e., the maximum number of a species or group of species that a hunter can legally catch). In the context of this management plan, a TAT includes all types of legal harvest, including subsistence harvesting, DLP, and sport hunting.

Traditional Knowledge (TK)- Traditional knowledge is a cumulative body of knowledge, know-how, practices and representations maintained and developed by the peoples over a long period of time. This encompasses spiritual relationships, historical and present relationships with the natural environment, and the use of natural resources. It is generally expressed in oral form, and passed on from generation to generation by story-telling and practical teaching[12].

Table of Contents

1. Introduction

Polar bears play an important role in the culture and livelihoods of Inuit and Cree who inhabit the coastal region of northern Québec. Inuit have used polar bear (*Nanuq* in Inuktitut, *Whabhskewh* in Cree) for food and clothing for millennia; the Cree of Eeyou Istchee have traditionally harvested fewer polar bear than the Inuit, but also place a high value on polar bears as socio-cultural symbols. Accompanying these traditional usages and views have been traditional harvest management practices that largely remain in place to this day.

However, while traditional harvesting practices have existed throughout centuries, the context in which they occur has not. Following the signing of the *1973 Agreement on the Conservation of Polar Bears* by the five polar bear Range States (Canada, United States, Norway, Denmark (Greenland), and Russia), formalized written management regimes were established in most Canadian jurisdictions, with Northern Québec, and adjacent marine areas, being an exception. There has also been increasing international scrutiny of polar bear management and harvesting and international polar bear trade. This has manifested itself in international bans by certain countries and international pressure for stricter control of international trade in polar bear under the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES). In this context, the lack of a formally regulated harvest-management regime in Québec, could be a factor in increased international scrutiny of polar bear management. Any sanctions against the trade of polar bear, including hides, to foreign countries, could deprive Inuit and Cree communities of important sources of income which could in turn negatively impact an important component of their culture – the hunting of polar bears and transformation of their parts for traditional uses.

Partly in response to the above-noted concerns, on January 10, 2012, the then Federal Minister of the Environment requested that the Nunavik Marine Region Wildlife Board (NMRWB) establish a management regime, including a Total Allowable Take (TAT), for the three subpopulations of polar bear that occur in the Nunavik Marine Region (NMR). Given the need for a provincial polar bear management plan (see s.5.4.1), the distribution of polar bears and the jurisdictional complexities of Northern Québec, it was deemed to be desirable and practical to develop a single management plan that could be applicable to both the onshore portion of Québec and adjacent marine regions (the NMR and the Eeyou Marine Region [EMR]). This plan is, therefore, intended to encompass the territories covered under the James Bay and Northern Québec Agreement (JBNQA), the Nunavik Inuit Land Claims Agreement (NILCA) and the Eeyou Marine Region Land Claims Agreement (EMRLCA). The management plan will be approved by the relevant management authorities in accordance with the decision-making mechanisms set out in each of these Agreements and will not be applicable beyond the boundaries defined within them (see Figure 1).

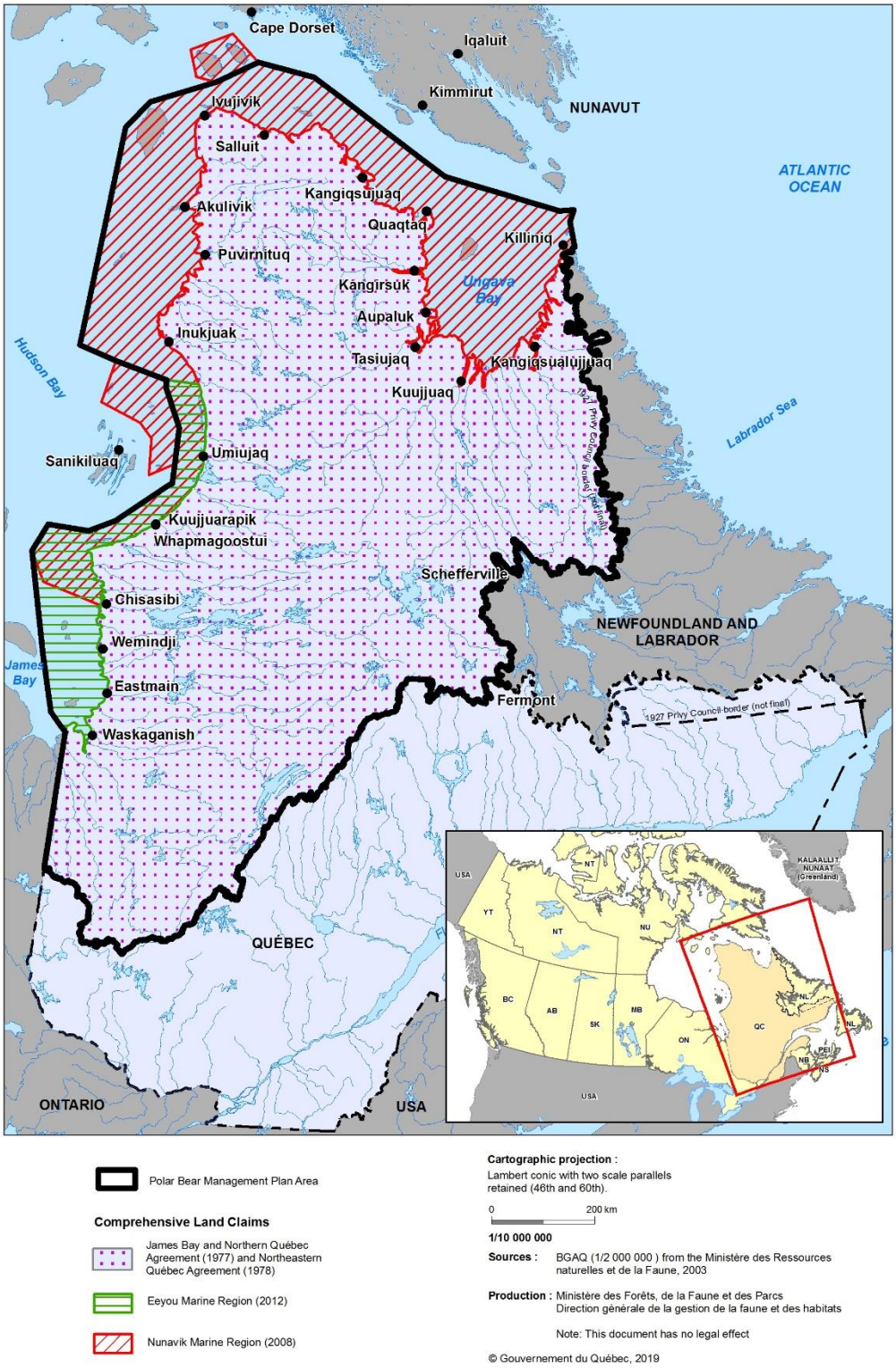

Figure 1. Management Plan Area Based on Relevant Land Claims Agreement Boundaries

2. Guiding Principles

This proposed polar bear management plan is guided by the following principles:

1. The polar bear management plan must recognize and respect the roles, responsibilities and authorities of each organization involved within its area of application (i.e., those areas defined under the Nunavik Inuit Land Claims Agreement (NILCA), the Eeyou Marine Region Land Claims Agreement (EMRLCA) and the James Bay and Northern Québec Agreement ("JBNQA")); collaboration and coordination between these authorities is important for effective polar bear management in Northern Québec.
2. Planning and decision making with regards to the conservation and management of polar bears must be founded upon the best-available Traditional Knowledge (TK) and scientific information; when there is divergence between the two, both perspectives must be considered. Up-to-date information on the status and trends of each polar bear subpopulation is essential for effective management and conservation.
3. The protection of human lives and property is paramount and must be considered when discussing the management and conservation of polar bears.
4. The management plan must be consistent with the wildlife management principles detailed in applicable Land Claims Agreements, including the principles of conservation.
5. Engagement and participation of Nunavik Inuit and the Crees of Eeyou Istchee during the development and implementation of this management plan is important to ensure that their approaches to wildlife management as well as their rights, priorities and concerns are fully considered.
6. Polar bear management in Québec, the Nunavik Marine Region (NMR) and the Eeyou Marine Region (EMR) should be adaptive and able to respond in a timely manner to new information and changing conditions.

The goal of this plan is to maintain healthy polar bear populations which remain an important component of the local ecosystem and which will be available for use by current and future generations in a way that respects and embodies the rights, culture and traditions of the Nunavik Inuit and the Crees of Eeyou Istchee.

3. Polar Bears and People

For millennia, polar bears have played an important role in the lives of the Inuit and Crees of Northern Québec and continue to do so to this day. Whereas Nunavik Inuit have a long history of harvesting polar bears, the Crees of Eeyou Istchee do so only on occasion, usually in defense of life and property, and do not consider themselves polar bear hunters in the same sense as Inuit.

Today, many Inuit continue to eat polar bear, which is generally distributed throughout the community and shared according to traditional values. There is now less reliance on them for clothing, though a number of people, especially elders, continue to make use of the skins for clothing, equipment and crafts. Instead, most of the skins obtained from the polar bear hunt are now sold to southern and international markets. This allows hunters, who may otherwise have limited alternative sources of income, to finance other subsistence hunting activities or simply to purchase supplies and food for their families. Although the economic benefits of polar bear harvesting cannot be overlooked, it is important to recall that the sale of polar bear hides has existed since arrival of the first European fur traders and is not an emerging phenomenon.

The importance of polar bear to Nunavik Inuit, and to the Crees of Eeyou Istchee, goes far beyond food security and economic benefits. It is difficult to quantify the indirect benefits of polar bear to the Nunavik Inuit since they are so closely tied to the hunt itself, but the learning of survival skills and life skills, feelings of fulfillment (especially from sharing the meat) and of pride or accomplishment are all derived from polar bear hunting. For example, the danger of the animal, as well as the skill required to hunt it on the ice make polar bear hunting an efficient and disciplinary way for young hunters to learn invaluable life lessons and traditional skills.

Among the Crees of Eeyou Istchee, most people will recognize a deep cultural importance of the polar bear, and they will share many stories, many of which have to do with the strength of the animal, and how to stay safe in its presence. They also generally recognize the importance that the Inuit attach to the polar bear. The Crees of Eeyou Istchee share with the Nunavik Inuit a growing concern about potential human-bear conflicts, as the bears come on shore and encounter hunting camps and hunters. They therefore also have a common interest in the subject of 'defense of life and property' and the development of appropriate mechanisms both for documenting bear encounters and in minimizing hazards (both for bears and people) associated with those encounters.

Further, polar bears are a part of the psyche of the peoples of Northern Québec. This is demonstrated in people's constant awareness of safety related to living with polar bears, especially when venturing outside of communities. Polar bears have a near-revered status with people often likening them to humans (e.g., referring to polar bears as fellow hunters). In communities that regularly hunt polar bears, harvesting a first polar bear is a coming-of-age experience and an important step in being recognized as a good hunter.

4. Species Description

4.1. Nomenclature

Taxonomic name: *Ursus maritimus* (Phipps 1774)

Inuktitut name: Nanuq, Nanuk

English name: Polar bear

French name: Ours blanc, Ours polaire

Cree name: Whabhskewh, Wâpaskw, Wâpiskw

4.2 Legal Status / Designation in 2022*

International Union for the Conservation of Nature (IUCN): Vulnerable (2015)

Canada (*Species at Risk Act (S.C. 2002, c.29)*): Special Concern (2011)

Québec (*Loi sur les espèces menacées ou vulnérables*): Vulnérable (2009)

Nunavut: Not Assessed

Ontario: Threatened (2009)

Newfoundland and Labrador: Vulnerable (2002)

* This list excludes the legal status / designation given to polar bears by other jurisdictions, which have no direct implication within the management plan area.

4.3 General Description

The polar bear is a top predator characterized by low reproductive rates, long life span, and late sexual maturity. It is a member of the taxonomic family *Ursidae* and is well-adapted to life on the sea-ice and in the water[13–15]. It is comparable roughly in shape and size to the brown bear (*Ursus arctos*), from which it evolved within the last 400,000 years[16,17]. However, its neck and nose (rostrum) are more elongated, it has a smaller and less dish-shaped head, and it lacks the characteristic shoulder hump. Its webbed and enlarged front paws make the polar bear a strong swimmer and its curved claws are well-suited for "hooking" seals, their primary food source. Other adaptations to the Arctic environment include furred foot pads and black skin. The black skin assists in absorbing solar energy, whereas the furred pads improve insulation and enhance traction on snow and ice. Polar bear fur appears sometimes white, but it also may be yellowish or off-white, depending on the time of year, and sometimes on the gender. Polar bears exhibit extraordinary strength when crushing through the sea-ice, digging into seal birth and haul-out lairs, or moving large boulders to uncover meat caches. As adults, males are larger and heavier than females: males can weigh around 800 - 1000 kg, and can be up to 300 cm long; females usually do not exceed 400 kg, and reach up to 250 cm in body length[18–20].

In general, biologists recognize four important age categories of polar bear: 1) cubs of the year (COYs), 2) yearlings and sub-adults, 3) prime-age adults, and 4) senescent adults. Survival rate also differ between genders with males generally having lower survival rates than females. In the wild, the maximum age a polar bear can attain is estimated at approximately 30 years[21,22].

Inuit, on the other hand, recognize several categories/classes of polar bears. 1) Atiqtalik – female on route to sea ice, 2) Pingalujait - a female with two small cubs, 3) Nalitariit - a female with two cubs who are as big as the mother, 4) Avutinikuk - a young bear that has left its mother, 5) Nukaugaq - a young male, 6) Angujjuaq - full grown male, 7) Arnaluq - pregnant female. Although there is some overlap for some of these categories/classes which are general in nature and age-specific, they represent the diverse understanding Inuit have of polar bears.

4.4 Biology

4.4.1 Life cycle and reproduction

Breeding occurs between March and June. When a male mates with a female, ovulation is induced, although implantation of the fertilized egg is delayed until October[19,23–25]. Depending on the subpopulation, female age at first reproduction varies between 4 and 7 years of age; in most subpopulations, the majority of females produce litters by age 6[26]. Male polar bears are also likely to become sexually mature by age 6, but younger males generally have low reproductive success because of competition from larger, older males. It appears that most males do not contribute reproductively to the population until they are 8–10 years old[27–31].

Pregnant females prepare and enter maternity dens in late fall and the young, normally 1–2, are born between November and early January. At birth, cubs weigh approximately 0.6 kg. They are nursed inside the den until sometime between the end of February and the middle of April. By this time the cubs weigh 10–12 kg[28]. A new litter is produced after 3 years of raising cubs, so the average interval between litters is approximately 3.6 years.

4.4.2 Natural Mortality and Survival

For polar bears, natural mortality can occur from numerous causes. Polar bears have been observed and documented to pose a threat to other polar bears[32–34]. Predation by wolves on polar bear cubs have been observed by Inuit and researchers[35]. Walruses have also been reported to kill polar bears in self-defence, but this is infrequent. Every life stage of a polar bear faces different challenges; therefore, the survival rates vary accordingly. Moreover, the survival rates for these life stages also vary slightly in each polar bear subpopulation because of the differences in ecosystem productivity.

4.4.3 Diet

Although polar bear diet varies throughout the year and across its range, they are highly carnivorous with ringed, bearded and harp seals making up most of their diet. Polar bears are also known to frequently include birds (and their eggs) and beluga whale in their diet. Other species such as walrus, narwhal, bowhead whale, arctic char, beaver, caribou, and harbour seal may also be preyed upon[36–38]. Nunavik Inuit report that, after spending extended periods at sea, bears returning to land eat large amounts of vegetation as a means of preparing their body for life on land. Elders report that a similar behaviour is observed in females preparing to enter maternity dens, and it is believed that their intake of moss and lichen allows them to better retain and absorb the oils contained in the seals that they have previously eaten[39].

Polar bears are well-adapted to times of food abundance and shortages. When food is in high abundance, polar bears can increase their body mass significantly. When food becomes scarce or unavailable, polar bears can live off their stored fat reserves[28,40]. While polar bears will hunt and scavenge throughout the year, feeding opportunistically on almost anything they can find, spring represent a crucial feeding period. As seal pups are born and become abundant, polar bears enter a period of high food intake where they will accumulate most of the fat needed to survive through the summer and fall seasons, when food resources are harder to access. In seasonally ice-free areas where bears move on shore, vegetation, berries, eggs, birds, and other terrestrial or marine-based food items are consumed[41–50]. Although the behaviour is not thoroughly documented, Cree and Inuit hunters report that fish and ringed seals are successfully preyed upon during summer, when there is little or no sea-ice[50,51]. Inuit from Kangiqsualujjuaq report that bears have recently developed the behavior of catching arctic char from rivers in a manner similar to that of brown bears catching spawning salmon[38]. Marine mammal ice-entrapment events and Inuit marine mammal harvesting can also create an additional food source which polar bears access by scavenging.

One aspect to take into consideration when discussing foraging opportunities for polar bear in relation to Inuit subsistence harvesting practices is that Nunavik Inuit have resumed the tradition of harvesting bowhead whales and although the number of hunts has been limited, they remain interested in doing so. The importance of bowhead carcasses to polar bear diets has been demonstrated in other regions, but can also lead to a greater risk of human-bear encounters[52]. The regulatory framework surrounding Nunavik's annual beluga hunt has, similarly, led to a change in the distribution and abundance of beluga carcasses. It is not known to what extent these supplementary food sources have impacted polar bear foraging habits.

4.4.4 Habitat

Polar bears utilize the marine environment for hunting marine animals, primarily when there is some degree of ice-cover. Polar bears have adapted to all different types of sea ice and are strong swimmers, capable of traveling long distances in open water. Inuit have indicated that bears can persist in open water and sea ice for the majority of their lives (the Inuktitut term for this is *Tulayuituq).* Inuit also recognize that different areas of the sea-ice habitat can be particularly important for separate aspects of polar bear life history (e.g. breeding areas, resting areas, feeding areas, etc.)[38,53].

Polar bears utilize most coastal areas of the Canadian subarctic and Arctic and occasionally travel considerable distances inland. In areas where there is only seasonal sea-ice, access to land is usually required for ice-free periods and for denning in winter. Although some denning does occur in packed snow drifts that have built up over pressure ridges in winter sea-ice, within the management area, polar bears den primarily on land. Dens are generally excavated in soil or snow and are then covered and closed by snowdrifts. While they are frequently located on islands or on land adjacent to areas with high seal densities in spring, dens can sometimes be found far inland from the coast or in areas of annual rough ice. Nunavik Inuit have also observed bears denning in snow buildups around hills and mountains, as well as using excavated dens south of the tree line[38]. All maternity denning sites are important areas because they provide shelter for the mother and offspring[53,54,63–66,55–62]. Satellite telemetry data from female collared polar bears indicate that they often return to the same area to den over the course of their lifetime.

4.5 Abundance and Distribution

4.5.1 Population Delineation and Global Range

There is an estimated world population of approximately 26,000 polar bears (95% CI = 22,000-31,000) occurring throughout the sub-arctic and Arctic regions of the northern hemisphere[67]. This estimate excludes any bears from the Arctic Basin subpopulation for which no information on abundance is available. Polar bears are highly mobile and there is significant genetic exchange across the circumpolar region. However, they are not distributed evenly throughout the Arctic, but rather show seasonal fidelity to local areas based, to some extent on their use of sea-ice as a platform for feeding, mating, and denning[68–70], but also by the availability and quality of sea-ice[71–76]. Given this, the global population has been divided into 19 "subpopulations"[77]; 13 of which exist in Canada[26], and three within the area represented by this management plan (Figure 2; see section 4.5.2, below).

For each of the three polar bear subpopulations that occur within the management plan area, information about its abundance, health and observed trends is included in the appendices that accompany the management plan. This information includes an overview of historical data and the most-recent information available for each subpopulation. Because polar bear research is ongoing and since abundance estimates are updated regularly, likely multiple times within the lifespan of this management plan, it is more appropriate to include this information in the appendices, which can be updated as new information becomes available.

The geographic boundaries of subpopulations that have become the basis for polar bear management in Canada were initially established by the Polar Bear Technical Committee (PBTC) (see section 5.5.2, below) and have since been updated based on the movements of satellite radio-collared female polar bears, mark-recapture efforts (including hunter returns of ear tags or samples from marked bears), and according to the hunting practices and information of local people[68,69]. However, the premise of identifying subpopulation boundaries continues to be disputed by Inuit, who maintain that polar bears do not stay within these boundaries and instead travel wherever they so choose. It is therefore important to specify that the geographic boundaries of subpopulations, although based on extensive information do not necessarily reflect ecologically meaningful separations. Rather, they are artificial boundaries used within a management context to track local trends in the polar bear population, to observe any changes in demographic parameters and behaviour as well as to conduct harvest monitoring. Doing so helps ensure that polar bear management is more practicable and better adapted to local conditions.

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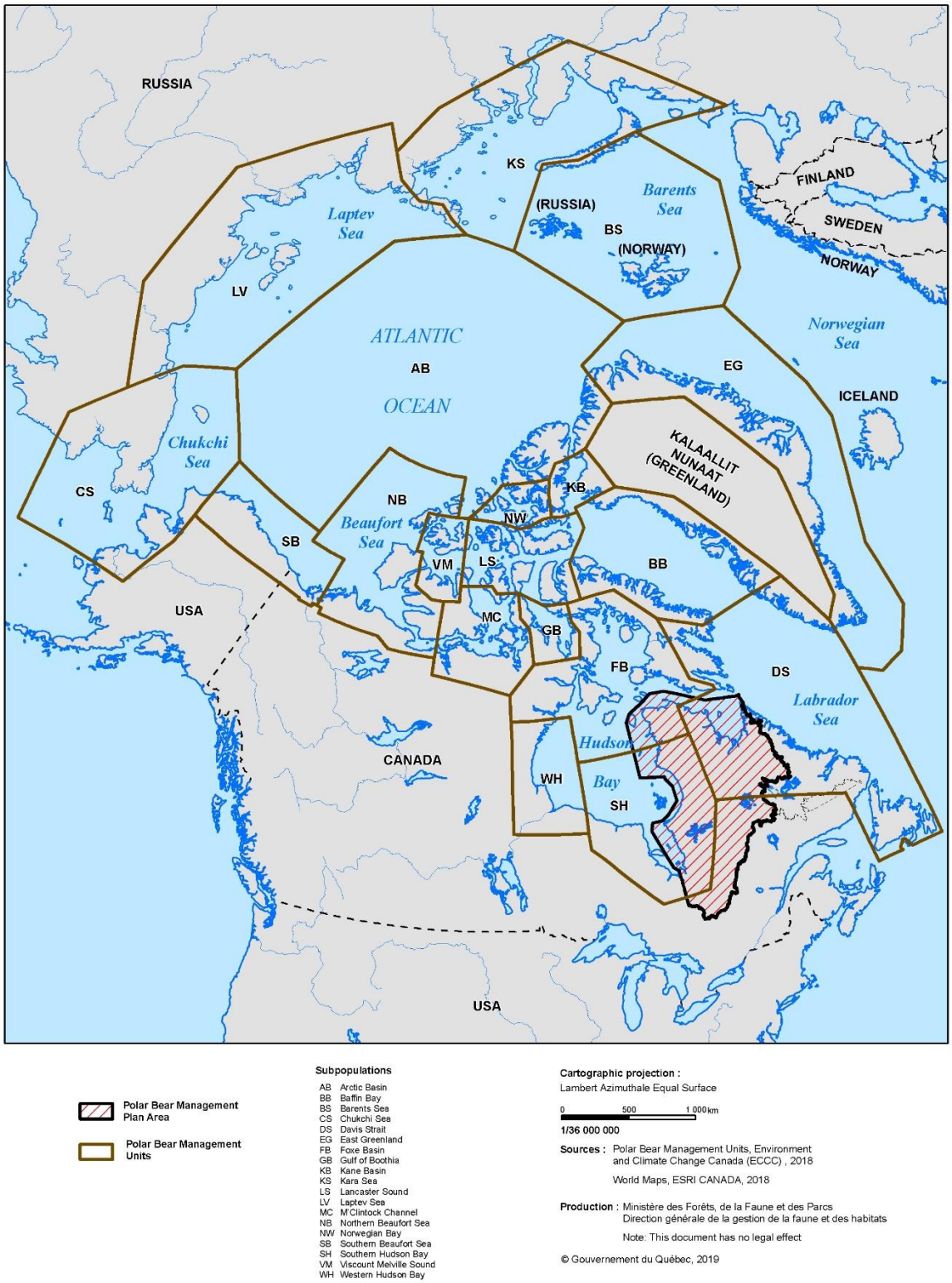

Figure 2. Global distribution of polar bear subpopulations

4.5.2 Range within the Management Plan Area

Three of Canada's polar bear subpopulations (Southern Hudson Bay, Foxe Basin and Davis Strait) occur in Northern Québec and its adjacent waters (Figure 3). These are among the southernmost subpopulations in the world and all of them experience a seasonally ice-free environment, which forces the bears onto shore during late summer, where they remain for several months while awaiting freeze-up. The distribution of each subpopulation within the management plan area is described below and in Figure 2:

- The Southern Hudson Bay subpopulation includes all of the area of James Bay and the Hudson Bay south of the 60th parallel, and is shared by Québec, Ontario and Nunavut.
- The Foxe Basin subpopulation occupies the northern part of Hudson Bay and the Hudson Strait, until a point west of the village of Kangiqsujuaq, and is shared by Québec and Nunavut.
- The Davis Strait subpopulation occupies the remaining portion of Hudson Strait and all of Ungava Bay, and is shared by Québec, Nunavut, Newfoundland & Labrador, and Greenland. Because the Davis Strait region was not traditionally referred to as such by Inuit, there is no equivalent terminology in Inuktitut. Consequently, Inuit have suggested that referring to this subpopulation as the "Killiniq-waters subpopulation" is more appropriate.

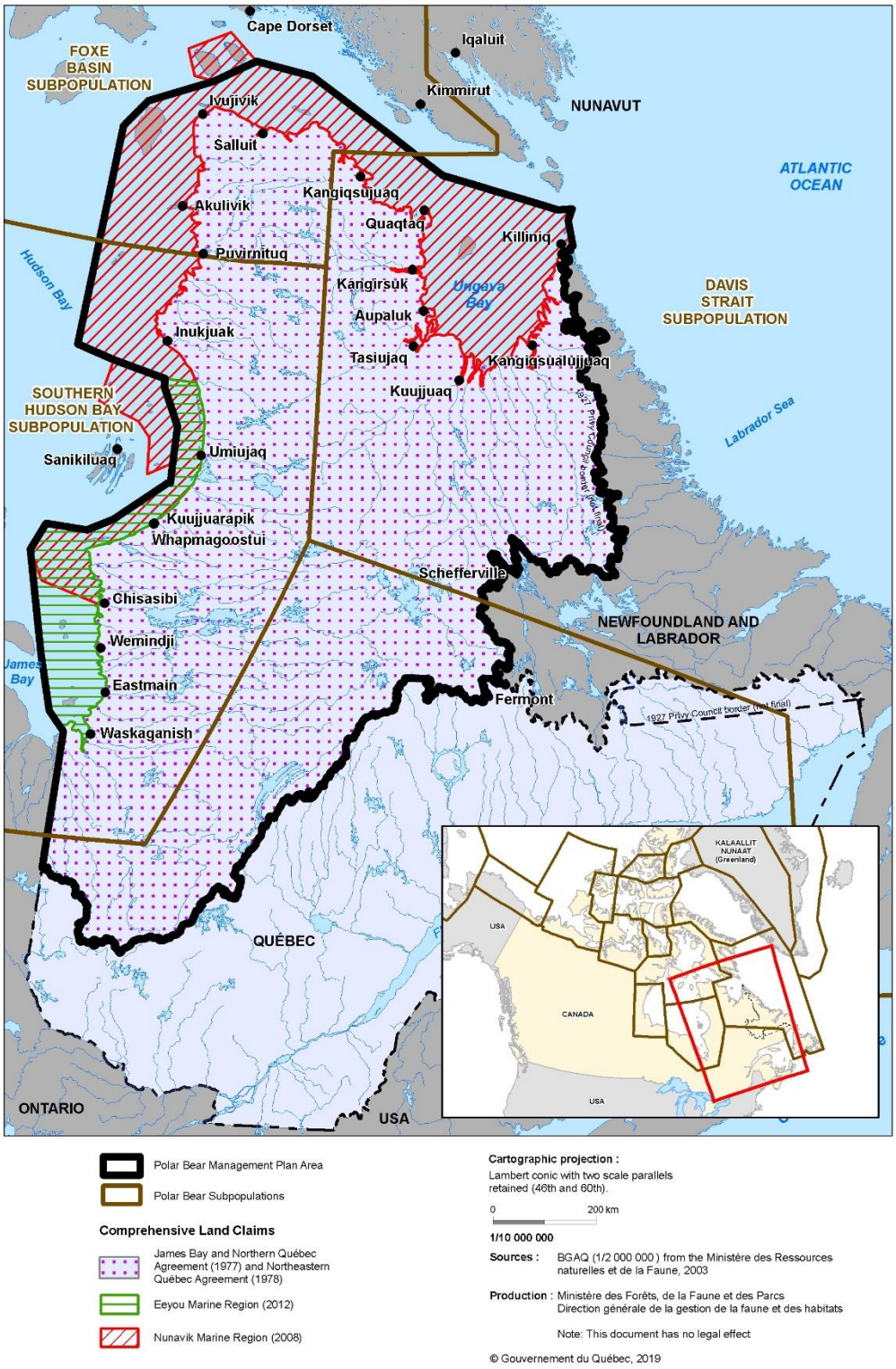

Figure 3. Polar Bear Subpopulations in the management plan area

651

5. Background – Collaborative management of polar bear in the Management Plan Area

The following section describes the elements that should be considered for the management of polar bears within the management area. While only modern management initiatives and frameworks are defined here, it is important to recognize that Inuit and Cree hunters have shared this region with polar bears for millennia. Throughout this time, they have developed a formal code of conduct, which puts forth a set of rules that govern all interactions with polar bear. Despite the advent of modern management practices and regulations, hunters in the region continue to rely strongly on their traditional values and rules.

5.1 Recent Management History

The following chronology highlights significant initiatives related to the conservation and management of polar bears since 1973. It is not inclusive of all work undertaken and in particular does not include specific LNUK initiatives or other similar community-based efforts.

- 1973: Agreement on the Conservation of Polar Bears (the Range State Agreement)
- 1975: Convention on the International Trade in Endangered Species of Wild Fauna and Flora Appendix II listing; at this time, CITES is implemented in Canada through regulations under the *Export and Import Permits Act* (EIPA), which includes polar bear on its list of species controlled 1975: James Bay and Northern Québec Agreement
- 1984: Nunavik Hunters, Fishermen & Trappers Association (*Anguvigaq*) Polar Bear Regulations
- 1996: Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Action proclaimed and EIPA regulations repealed; polar bear included in Schedule I of the Wild Animal and Plant Trade Regulations
- 2008: Nunavik Inuit Land Claims Agreement
- 2009: Listed as a vulnerable species under the Québec Act Respecting Threatened or Vulnerable Species listing
- 2010: Davis Strait User to User Meeting
- 2011: Southern Hudson Bay Polar Bear Voluntary Agreement on, inter alia, allocation of harvest*
- 2011: Federal Species at Risk Act Listed Polar Bear as a species of special concern
- 2012: Eeyou Marine Region Land Claims Agreement
- 2014: Nunavik Marine Region Wildlife Board Southern Hudson Bay Polar Bear Public Hearing (2014)
- 2014: Southern Hudson Bay Polar Bear Voluntary Agreement on, inter alia, allocation of harvest**
- 2015: 2nd Davis Strait Polar Bear User to User Meeting
- 2016: TAT established for Southern Hudson Bay within Nunavik Marine Region
- 2018: COSEWIC Assessment of Polar Bears - *Special Concern*
- 2020: Southern Hudson Bay Polar Bear User to User Meeting

* The 2011 Voluntary agreement was for one year (i.e., 2012), and was later extended for a second year (2013)

** The 2014 Voluntary Agreement was for a period of two hunting seasons (2014-2016).

5.2 Land Claims Agreements

The following section is intended to provide a brief description of the various Land Claim Agreements applicable to the area covered by the management plan. For additional context regarding the framework for polar bear management established by each Land Claim Agreement, it is necessary to refer to the official text of each agreement.

5.2.1 James Bay and Northern Québec Agreement[9]

The JBNQA signed principally between the Crees of Eeyou Istchee, the Nunavik Inuit and the Governments of Québec and Canada, is widely recognized as the first comprehensive land claim agreement in Canada and came into force in 1977. The JBNQA establishes a special hunting, fishing and trapping regime. Under this regime, the polar bear is a species reserved exclusively for the Native people (persons who are eligible under Sections 3 and 3A of the JBNQA). The exercise of the right to harvest is subject to the principle of conservation as established in the JBNQA. The JBNQA provides for the establishment of guaranteed levels of harvest to the Native people before any other type of harvest can be carried out. The JBNQA applies to Quebec territory as defined in article 1.16 of the JBNQA, while the hunting, fishing and trapping regime applies to the territory defined in article 24.12 of this agreement. The JBNQA also establishes the constitution and responsibilities of the Hunting, Fishing and Trapping Coordinating Committee (see section 6.1.1). The JBNQA was approved, given effect and declared valid by the *Act approving the James Bay and Northern Quebec Agreement* (chapter C-67).

5.2.2 Nunavik Inuit Land Claims Agreement[10]

The Nunavik Inuit Land Claims Agreement (NILCA) came into force in 2008 and establishes rights for Inuit in the Nunavik Marine Region (NMR), namely the islands and waters offshore of Nunavik. The NILCA is an Agreement between the Inuit of Nunavik, the Government of Canada and the Nunavut Government. Established pursuant to Article 5 of the NILCA, the Nunavik Marine Region Wildlife Board (NMRWB) makes decisions on wildlife management issues in the NMR, including polar bear management. The NILCA (s. 5.3.7 c)) establishes a presumption that Nunavik Inuit need the total allowable take of polar bear. The relevant federal or territorial (Nunavut) Ministers (in the case of polar bear, the Minister of Environment and Climate Change and the Minister of Environment, respectively) maintain ultimate authority.

5.2.3 Eeyou Marine Region Land Claims Agreement[8]

The Eeyou Marine Region Land Claims Agreement (EMRLCA) came into force in 2012, and establishes the rights of Crees in the Eeyou Marine Region (EMR), namely the islands and waters of eastern James Bay and a portion of eastern Hudson Bay. The EMRLCA is an Agreement between the Crees of Eeyou Istchee, the Government of Canada and the Nunavut Government. The EMRLCA (par. 11.3.1 and Schedule 11-1) establish that polar bear is a wildlife species exclusively reserved for the use of the Crees of Eeyou Istchee. Established pursuant to Chapter 13 of the EMRLCA, the Eeyou Marine Region Wildlife Board (EMRWB) makes decisions on wildlife management issues in the EMR, including polar bear management. The relevant federal or territorial (Nunavut) Ministers (in the case of polar bear, the Minister of Environment and Climate Change and the Minister of Environment, respectively) maintain ultimate authority.

5.3 Offshore Overlap Agreements

Harvesting activities by Cree and Inuit were not historically constrained by the jurisdictional boundaries that exist today. Certain areas were traditionally used and occupied by more than one group. The NMR, the EMR, the Nunavut Settlement Area and the Labrador Settlement Area (LSA) provide for reciprocal rights in these overlapping areas that are protected by Section 35 of the *Constitution Act, 1982*. These

reciprocal arrangements form an integral part of each of the offshore Land Claims Agreements. Three such overlap agreements, between the relevant parties, apply within the geographic area addressed within this management plan and are presented in this section.

5.3.1 Reciprocal Arrangements Between Nunavik Inuit and the Inuit of Nunavut[78]

Two areas within the NMR are shared by Nunavut and Nunavik Inuit; these are referred to as Areas of Equal Use and Occupancy (AEUO). The first is at Nottingham and Salisbury Islands and is within the range of Foxe Basin polar bears. The second is within the Southern Hudson Bay subpopulation area and includes a number of islands situated between the communities of Umiujaq, QC and Sanikiluaq, NU. Within these AEUO, Inuit from Nunavik and Nunavut have equal harvesting rights. Until a formal process to govern wildlife management within the AEUO is established, the Nunavut Wildlife Management Board retains exclusive jurisdiction over this area, but the NWMB's membership is varied to allow for Nunavik Inuit representation through the appointment of members by Makivik (see NILCA Part 27.6).

5.3.2 A Consolidated Agreement Relating to the Cree/Inuit Offshore Overlapping Interests Area Between the Crees of Eeyou Istchee and the Nunavik Inuit (The Cree/Inuit Overlap Agreement)[79]

Similarly, the Crees and Inuit traditionally used and occupied overlapping areas in Southern Hudson Bay and James Bay. Because traditional ties to these areas were not uniform, three separate overlap areas were created (i.e., the Inuit Zone, the Joint Zone and the Cree Zone) to reflect the latitudinal gradient of occupancy by each group. Throughout the overlap area, the Nunavik Inuit and the Crees of Eeyou Istchee have the same rights respecting the harvest of wildlife; these rights being exercised in accordance with each group's respective customs and traditions, in a manner so as not to compromise each other's harvesting activities.

Although harvesting rights are equal within all zones, the management regime applicable to each is not. For the Inuit Zone, the NMRWB maintains wildlife management responsibilities, but a Cree Nation Government observer is entitled to replace a Makivik appointed board member during any vote. For the Joint Zone, wildlife management decisions are to be made jointly and equally by the NMRWB and EMRWB. Within the Cree Zone, the EMRWB maintains wildlife management responsibilities, but a Makivik appointed observer is entitled to replace a Cree board member during any vote.

5.3.3 Nunavik Inuit Rights and Interests in the Labrador Inuit Settlement Area Portion of the Overlap Area[80]

The last overlap area included within this management plan's area of application is situated along the Québec/Labrador border and into the adjacent offshore areas. Pursuant to this agreement, Nunavik Inuit and Labrador Inuit have equal harvesting rights within the area of overlap. Although Labrador Inuit and Nunavik Inuit may share the right to harvest, their combined take shall not exceed the total allowable take (TAT) in either region and is subject to any other obligations in effect. As such, the bodies responsible for wildlife management in the NMR (NMRWB) and in the LSA (Torngat Secretariat) must take into account each other's current and historic harvesting levels, as well as those of other groups (e.g., Nunavut Inuit) when setting harvest limits.

5.4 Legislation and Regulations

5.4.1 COSEWIC and the Species At Risk Act (S.C. 2002, c. 29)(SARA)[81]

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC)[82], established in 1977, is the independent body responsible for identifying and assessing the status of species considered to be at risk in Canada. COSEWIC uses best available information, including science, Aboriginal Traditional Knowledge and community knowledge. Membership consists of members from each of the 13 provincial and territorial government wildlife agencies, 4 federal agencies (Canadian Wildlife Service of Environment and Climate Change Canada, Parks Canada Agency, Department of Fisheries and Oceans, and the Canadian Museum of Nature), 3 non-government science members, 10 Co-chairs of the Species Specialist Subcommittees and 1 Co-chair from the Aboriginal Traditional Knowledge (ATK) Subcommittee. The assessments made by COSEWIC are forwarded to Canada's Minister of Environment and Climate Change and to the Canadian Endangered Species Conservation Council. The Governor in Council (Cabinet), on the recommendation of the Minister of Environment and Climate Change, decides whether or not to add the species to the federal List of Wildlife Species at Risk, or refer the matter back to COSEWIC. In other words, if COSEWIC classifies a species as *Endangered* it does not automatically become a Species at Risk under SARA. As a legislated requirement, COSEWIC reviews species assessments at least every 10 years, or earlier if new information suggests a change in status may be warranted.

In 1986[83], after the first COSEWIC assessment, it was determined that polar bears were *Not at Risk*. This was changed to a designation of *Special Concern* in 1991[84], a status which was confirmed by assessments conducted in 1999[85], 2002[86], and 2008[87]. Following the 2008 assessment, public consultations were held to inform the possible listing of polar bear as a species of Special Concern under SARA. These consultations were completed in 2011.

Despite disagreement from most Inuit, the polar bear was listed federally as a species of Special Concern under SARA in 2011. The listing requires the identification of conservation measures for the species; however, it does not impose any restrictions on the harvest, nor does it require the identification and protection of critical habitat. However, under SARA, (ECCC) is responsible for the preparation of a management plan and is required to report on progress every subsequent five-year period after the publication of the final document on the SAR public Registry, until the objectives are achieved. Once the present plan is finalized, it is expected that it will be incorporated, in part, or in whole, within the SARA Management Plan. The SARA Management Plan will also include other provincial and territorial management plans.

5.4.2 *An Act Respecting Threatened or Vulnerable Species* (chapter E-12.01) (Québec)[88]

The objective of this Act is to protect biological diversity and to prevent the extinction of wildlife and plant species in Québec. It is meant to prevent the decline of previously listed species and to ensure the protection of their habitats, as well as to prevent any other species from becoming threatened or vulnerable. In accordance with the *Regulation respecting threatened or vulnerable wildlife species and their habitats*, the Gouvernement du Québec listed the polar bear as a vulnerable species in 2009[89].

Established under article 6 of this Act, the 1992 Québec Species at Risk Policy stipulates that a vulnerable species is one whose survival is at risk even if its disappearance is not foreseen. This category includes species whose medium and long-term survival is not guaranteed. Downward population trends or habitat degradation may occur if no action is taken to ensure the species survives.

Identification of prohibited activities for listed species must take into account the level of risk they face. In the case of vulnerable species, their survival is not threatened in the short or medium term but could become threatened if no measures are taken to reverse the factors affecting them. Therefore, certain species, particularly if listed as vulnerable, are able to undergo some level of exploitation if it can be demonstrated that such activities in no way harm the current state of affairs and if all possible measures are taken to restore balance.

In Northern Québec, provisions dealing with threatened or endangered species (e.g. polar bear) are also subject to the terms of the *Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories*[90] (see section 5.4.4, below).

5.4.3 *An Act Respecting the Conservation and Development of Wildlife* (chapter C-61.1) (Québec)[91]

The objective of this Act is the conservation of wildlife and its habitat, their development in keeping with the principle of sustainable development, and the recognition of every person's right to hunt, fish and trap in accordance with the law. To that end, this Act establishes various prohibitions that relate to the conservation of wildlife resources and various standards of safety, and sets forth the rights and obligations of hunters, fishers and trappers. According to this Act, the hunting and trapping of animals is prohibited. However, the Minister may, by regulation, allow the hunting and trapping of any animal or any animal of a class of animals determined by the Minister. Under this Act's *Regulation respecting trapping activities and the fur trade*[92], in order to have in one's possession or to export outside Québec a raw polar bear pelt from Québec, a person needs to have a tag provided by the MFFP attached to the pelt. Under this Act's *Regulation respecting animals that must be declared*[93], wounded or dead polar bears must be reported to a wildlife protection officer and given to them if required. The Crees and Inuit of Québec may, however, own the proceeds of their right to harvest under the *Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories*[90] and are therefore exempt from the obligation to affix a tag in order to be able to possess an undressed pelt of a polar bear, as well as the obligation to declare bears dead. However, they must report their catches and affix a tag on polar bear skins in order to be able to sell them to a non-beneficiary of the JBNQA or export them outside Québec. Sport hunting of polar bears is prohibited as harvesting is reserved exclusively to the beneficiaries of the James Bay and Northern Québec Agreement pursuant to the *Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories*[90]. Where any provision of the *Act Respecting the Conservation and Development of Wildlife*[91] is incompatible with any provision of *the Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories*[90], the latter prevails.

5.4.4 An Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories (chapter D-13.1) (Québec)[90]

The *Act Respecting Hunting and Fishing Rights in the James Bay and New Québec Territories*[90] notably implements Section 24 of the James Bay and Northern Québec Agreement. The Hunting, Fishing and Trapping Regime established by this Act is subject to the principle of conservation, as defined in the JBNQA and previously in this document. According to this Act, polar bear is, on the territory of application of the regime, reserved for the exclusive use of JBNQA beneficiaries who may exercise their right to harvest throughout the year. This Act provides for the process of determining and revising guaranteed harvest levels, which were established by agreement between the parties at 58 bears for Inuit in 1985 and 4 bears for Cree in 1989.

5.4.5 Nunavut Wildlife Act[94]

On July 1, 2015, several new wildlife regulations[95–97] and orders under the Nunavut Wildlife Act came into effect within the Nunavut Settlement Area (NSA). At the time of writing, the Wildlife Transitional Regulations[98] remain in effect within the NMR and EMR. Pursuant to these transitional regulations, only regulations that were previously enforced through the Northwest Territories *Wildlife Act*[99]are currently enforceable within the NMR and EMR lands, the new wildlife regulations and orders not having been adopted outside of the NSA. This section will be amended once a permanent arrangement has been made with regards to the application of the Nunavut Wildlife Act and its regulations within the NMR and EMR.

5.4.6 Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act (WAPPRIITA)[100]

Canada meets its obligations under the CITES through WAPPRIITA. This Act regulates import, export and interprovincial transport of certain species of wildlife and their parts and derivatives. It applies to:

- species listed under the Appendices of CITES;
- foreign species that were taken, possessed, distributed or transported in contravention of the law of a foreign state;
- Canadian species whose transportation is regulated by provincial or territorial laws;
- species whose introduction into Canada could be harmful to Canadian ecosystems.

Polar bear is listed on Appendix II of CITES. Appendix II species are not necessarily threatened with extinction but for which trade must be controlled to avoid a detriment to the survival of the species in the wild. CITES export permits are required for international trade and certain requirements must be met before an export permit can be issued. This includes an evaluation of whether the specimen being traded has been legally harvested, and whether the trade of the specimen is not detrimental to the species (a "non-detriment finding" or NDF).

5.5 Other Polar Bear Management Frameworks

5.5.1 1973 Agreement on the Conservation of Polar Bears[101]

The need for an international convention or agreement for polar bear conservation was originally recognized and pursued in the mid-1960s. Increased hunting of polar bears had led to severe pressure on the species in some regions of the Arctic. The Arctic Range States (Canada, Denmark (Greenland), Norway, the Union of Soviet Socialist Republics [U.S.S.R., now Russia] and the United States) recognized the need for improved management of polar bears based on scientific knowledge. The *Agreement on the Conservation of Polar Bears*[101] (the 1973 Agreement) was signed in Oslo on November 15, 1973, and entered into force on May 26, 1976. According to the 1973 Agreement, the Range States recognize that the polar bear is a significant resource of the Arctic Region that requires protection. By signing the Agreement, the Range States agreed to take appropriate action to protect the ecosystems of which polar bears are a part, with special attention to habitat components such as denning and feeding sites and migration patterns, and to manage polar bear populations in accordance with sound conservation practices based on the best available scientific data.

At the time the 1973 Agreement was signed, the most significant threat facing the polar bear was overharvesting, and populations in some areas were considered to be substantially reduced. However, over 45 years have since passed, harvest control measures have been implemented, and harvest is no longer considered to be the most significant threat to the species.

In 2009, the Range States started to develop a Circumpolar Action Plan (CAP)[102] to address seven key threats, climate change being the over-arching, long-term and most significant threat facing the polar bear. The CAP, approved by the Range States in 2015, is a range-wide strategy designed to guide the mitigation of those threats. It recognizes that there are already effective management systems in place in each Range State, and therefore focuses on issues that are best coordinated at the bilateral or multilateral level. The CAP identifies general actions to be undertaken over the next ten years (2015-2025) and is accompanied by a more detailed implementation plan for the first two years. Progress will be reviewed every two years by the Range States at their Meetings of the Parties and the implementation plan will be updated accordingly. Progress reports and action tables will be made public.

5.5.2 The Federal/Provincial/Territorial Polar Bear Administrative Committee (PBAC) and the Polar Bear Technical Committee (PBTC)

Canada's commitment to a cooperative approach to polar bear research and management began almost 45 years ago with the establishment of the PBAC and the PBTC. The PBAC provides a forum for provincial, territorial and federal jurisdictions to work together to manage polar bears, and to ensure that Canada fulfills its obligations to the 1973 *Agreement on the Conservation of Polar Bears*. In this capacity, the PBAC plays a key role in national coordination and cooperation within and between jurisdictions. The PBTC is composed of experts from Canadian jurisdictions and co-management partners, in both TK and science, who review and evaluate new information in order to provide status and trend updates annually, and to advise the PBAC on technical matters.

6. Organizations involved in the management of polar bear within Québec, the Eeyou Marine Region and the Nunavik Marine Region: their roles & responsibilities

Management efforts are shared in accordance with the roles and responsibilities of the various stakeholders and governmental organizations involved. Although the parties involved in the development of this management plan have varying levels of management authority and, though the scope of their involvement is not uniform, the sum of their parts is essential to the implementation of an effective polar bear management plan. From the involvement of hunters whose constitutional harvesting rights stand to be affected by any future regulations, to governments who are the ultimate authorities responsible for the implementation and enforcement of any conservation and management measures that will arise from this process, this has been a collaborative effort throughout. Polar bear management in the management plan area falls under the legislative authority of various entities and involves multiple stakeholders. In order to provide some clarity about the processes at play, the following section provides an overview of the role that each organization plays with regards to the planning, approval and implementation of the Québec-EMR-NMR Polar Bear Management Plan.

6.1 Organizations whose role applies only in Québec

6.1.1 Hunting, Fishing and Trapping Coordinating Committee (HFTCC)

The HFTCC is the preferential and exclusive forum for Native people and governments to jointly formulate regulations and supervise the administration and management of the hunting, fishing and trapping regime established under Section 24 of the JBNQA. The HFTCC can also initiate, discuss, review and propose to the responsible Provincial or Federal minister regulations or other measures relating to the regulation, supervision and management of the hunting, fishing and trapping regime.

In addition, subject to certain provisions, the responsible minister shall consult with the HFTCC before submitting a new regulation or other decision for enactment or taking new action and before modifying or refusing to submit for enactment draft regulations or other decisions from the HFTCC. He shall endeavor to respect the views and positions of the HFTCC on any matter respecting the hunting, fishing and trapping regime. When the HFTCC or the responsible government decides that regulations are necessary, the responsible government shall make regulations with a minimum of impact on the beneficiaries of the JBNQA and harvesting.

The HFTCC members are appointed as follows: the Gouvernement du Québec appoints 4 members, Government of Canada appoints 4 members, the Inuit (Makivik Corporation) appoint 3 members, the Crees (Cree Nation Government) appoint 3 members and the Naskapi (Naskapi Nation of Kawawachikamach) appoint 2 members.

6.1.2 Gouvernement du Québec - Ministère des Forêts, de la Faune et des Parcs (MFFP)

The Ministère des Forêts, de la Faune et des Parcs is the authority responsible for the management of wildlife within Québec (under the authority of MFFP Minister) and therefore participates in interjurisdictional processes related to polar bear management. In the Québec territory covered by the JBNQA, polar bear management must be carried out in accordance with Section 24 of the JBNQA.

The MFFP shares, with neighbouring authorities, responsibility for monitoring the abundance and trends of the three polar bear subpopulations present in Québec and in adjacent waters. The MFFP is also

responsible for compiling and analyzing harvest data. Currently, the monitoring of polar bear harvest is implemented by the MFFP at the community level through a collaboration with representatives of the Kativik Regional Government's Hunter Support Program in each of the 14 Inuit communities and with the Cree Trappers Association for the five coastal Eeyou Istchee Cree communities. At the time of publishing this management plan, in Québec, the Inuit and the Crees are not required to register their polar bear harvest (except for portions of the range of the South Hudson Bay subpopulation). They do so on a voluntary basis and the harvest data obtained to date by the MFFP is therefore incomplete.

Under the *Act Respecting the Conservation and Development of Wildlife*[90], the possession of a raw polar bear pelt is subject to specific rules in Québec. The MFFP is responsible for the distribution of tags which are mandatory for any non-Native person having a raw polar bear hide in his possession as well as to export hides outside of Québec. The MFFP is also responsible for issuing export permits for interprovincial trade (these are also necessary to obtain international export permits).

The wildlife protection division of MFFP is responsible for enforcement and investigations concerning the registration and the trade of polar bear pelts within its jurisdiction in collaboration with Environment and Climate Change Canada. Wildlife protection officers are also involved in the promotion of wildlife conservation and have developed education and awareness initiatives for this purpose. MFFP has posted protection officers in some Cree and Inuit communities to fulfill the above-noted roles. In addition, wildlife protection assistants (Uumajuit wardens) are appointed in most Nunavik communities, through a collaboration between the MFFP and the Kativik Regional Government, to assist wildlife protection officers in the performance of their duties.

6.2 Organizations whose role applies to the Marine Regions only

6.2.1 Eeyou Marine Region Wildlife Board (EMRWB)

The EMRWB is an 'institution of public government' and an independent co-management body established under the EMRLCA. Members of the EMRWB are appointed by Canada (2), the Government of Nunavut (1) and the Cree Nation Government (3). The members nominate a chair, who is appointed by the Minister of Fisheries and Oceans (Canada) in consultation with the Minister of the Environment (Canada) and jointly with the Minister of the Environment (Nunavut).

The Board has primary responsibility with regards to wildlife management and the regulation of access to wildlife within the EMR. All decisions of the EMRWB are subject to approval by the responsible Minister(s) and may only limit Cree harvesting to the extent necessary to effect a conservation purpose, to give effect to a Total Allowable Take (or TAT) or to the provisions of the EMRLCA arising from the Reciprocal Agreement between the Crees of Eeyou Istchee and the Nunavik Inuit, or for public health and safety reasons. In the case of polar bears, the EMRWB has the authority to establish, modify or remove a TAT and non-quota limitations for the EMR. The EMRWB may also approve the adoption and implementation of a management plan for various wildlife species, including polar bears.

As explained below, the EMRWB is expected to work closely with the Cree Trappers' Association (at the local and regional level) as well as with the Cree Nation Government, the 'government designated organization' (GDO) for these provisions in the EMRLCA. The CTA also has employees who work at the community level (EMR officers), and who have responsibilities for linkages with the Regional CTA on matters of shared concern or responsibility.

6.2.2 Nunavik Marine Region Wildlife Board (NMRWB)

Similar to the EMRWB, the NMRWB is also an independent co-management body, but was established under the NILCA. Members of the NMRWB are appointed by Canada (2), the Government of Nunavut (1) and the Makivik Corporation (3), with the members nominating a chair who is appointed by the Minister of Fisheries and Oceans (Canada) in consultation with the Minister of the Environment (Canada) and jointly with the Minister of the Environment (Nunavut).

The Board has primary responsibility with regards to wildlife management and the regulation of access to wildlife within the NMR. All decisions of the NMRWB are subject to approval by the responsible Minister(s) and may only limit Nunavik Inuit harvesting to the extent necessary to effect a conservation purpose, to give effect to a Total Allowable Take (or TAT) or to the overlap agreements passed with the Crees of Eeyou Istchee, the Nunavut Inuit and the Labrador Inuit, or for public health and safety reasons. In the case of polar bears, NMRWB responsibilities include establishing, modifying, or removing levels of TAT and non-quota limitations for the NMR. The NMRWB may also approve the adoption and implementation of a management plan for various wildlife species, including polar bears.

6.2.3 Government of Nunavut, Department of Environment

Under the NILCA and EMRLCA, the Nunavut's Minister of Environment retains the ultimate authority over wildlife management for species that fall under his or her authority. In the case of polar bears, this authority applies when bears are situated on lands of the NMR and EMR. The Minister of Environment is therefore involved in the approval and implementation of decisions stemming from either the NMRWB or EMRWB as they pertain to polar bears. This process is complex and yet to be formalized although open dialogue and discussion with all stakeholders is currently undertaken.

Department of Environment staff conduct research and undertake population assessments collaboratively on shared populations, providing information for decision-making to all jurisdictions. This information is used by the respective jurisdictions to inform their own processes within their specific context.

6.3 Organizations with roles in Québec and in the Marine Regions.

6.3.1 Cree Nation Government (CNG)

The CNG is the successor (2014) to the Cree Regional Authority, the aboriginal government institution created by the JBNQA. It exercises a number of responsibilities derived from the JBNQA and its implementation, as well as responsibilities derived from the EMRLCA. In some cases, it is the body which, with the Grand Council of the Crees (of Eeyou Istchee) may give valid consent on behalf of the Crees, where this is provided for by law or by the provisions of the JBNQA and EMRLCA. It is the title holder for the islands owned by the Crees along the coast (other than those lands reserved to the Government of Canada). It is fully involved in the implementation of wildlife management regimes in the JBNQA territory, and names the Cree participants in the EMR 'institutions of public government' (wildlife board, planning commission and impact review board).

6.3.2 Local Cree Trappers' Associations (Local CTAs)

There are five coastal Cree First Nations, on the Québec shore. Each Cree First Nation has its own local Cree Trapper's Association, local directors of which also constitute the board of the regional Cree Trappers' Association. The implementation of the EMRLCA, including the provisions relating to SH polar bear subpopulation management, and the reporting of DLP incidents in particular, depends on the close

working relationship between the local CTA's, the regional office, and the Cree institutions of government – the local First Nations and the Cree Nation Government.

6.3.3 Regional Cree Trappers' Association (CTA)

The CTA was created by Section 28 of the JBNQA, and its original mandate was linked directly to the fur trapping and processing economy in the Cree communities. It dealt with the registration of pelts for sale, and this function remains relevant where polar bear hides are registered for sale (the relevant tags are issued by the MFFP). The CTA has taken on a broader range of responsibilities for tracking big game harvests and is in that context a relevant player in the SH polar bear subpopulation management context.

The EMRLCA of 2012 made use of the CTA structure and regional organization and assigned to it a number of functions directly relevant to tracking harvests of wildlife along the coast and formulating recommendations dealing with issues of allocation and reporting. It therefore plays a major complementary role alongside the EMRWB, and maintains a close working relationship – in addition to its JBNQA responsibilities

6.3.4 Local Hunting, Fishing and Trapping Associations (HFTA) / Local Nunavimmi Umajulirijiit Katujjiqatigiinningit (LNUKs)

Each Nunavik community has a local HFTA, composed of members elected within the community. These organizations were first established to act as consultative bodies for issues pertaining to wildlife management within Nunavik, particularly under section 24.5.4 of the JBNQA. Later, the HFTAs assumed the functions of *Local Nunavimmi Umajulirijiit Katujjiqatigiinningit* (LNUKs), as specified in the NILCA. LNUKs are responsible for the management of harvesting by their members (Inuit); they act as consultative bodies on wildlife matters, can make recommendations about wildlife management measures to the *Regional Nunavimmi Umajulirijiit Katujjiqatigiinninga* and are responsible for the management of harvest allocations made by the RNUK at the community level when harvest limitations are established.

6.3.5 Nunavik Hunting, Fishing and Trapping Association (NHFTA) / Regional Nunavimmi Umajulirijiit Katujjiqatigiinninga (RNUK)

The NHFTA (Anguvigaq) is a regional body established to represent the harvesting rights of Nunavik Inuit, particularly under the JBNQA (paragraph 24.5.4). The role of the NHFTA is restricted to matters that affect wildlife harvesting in Nunavik. Like the Local HFTAs, the NHFTA assumed the responsibilities of the *Regional Nunavimmi Umajulirijiit Katujjiqatigiinninga* (RNUK) after signing of the NILCA; the RNUK's mandate is limited to matters affecting the NMR. Among its responsibilities, the RNUK acts as a consultative body on all wildlife matters in the NMR, can recommend management measures to the NMRWB on behalf of LNUKs and is responsible for the allocation of harvest among the LNUKs when harvest limitations are established.

6.3.6 Makivik Corporation

The Makivik Corporation (Makivik) is the legal entity mandated to protect the rights and interests of Nunavik Inuit as they are defined in the (JBNQA) and, more recently, in the NILCA. In this capacity, Makivik is responsible for the appointment of Inuit members to the HFTCC and to the NMRWB. Through its Renewable Resources Development Department, Makivik strives to ensure that the traditions and rights of Nunavik Inuit are respected in all aspects of polar bear management. The department also operates the Nunavik Research Centre, which coordinates a number of programs including those aimed at the

collection of biological samples from various wildlife species, mostly linked to wildlife health and monitoring programs.

6.3.7 Government of Canada – Environment and Climate Change Canada (ECCC)

Under the NILCA and EMRLCA, Canada's Minister of Environment and Climate Change retains the ultimate authority over wildlife management for species that fall under his or her authority. In the case of polar bears, this authority applies when bears are situated on sea ice, or in the waters of the NMR and EMR. The Minister responsible for ECCC is therefore involved in the approval and implementation of decisions stemming from either the NMRWB or EMRWB as they pertain to polar bears.

Under the federal *Species at Risk Act* (SARA), ECCC is responsible for completing a national management plan for polar bears. The Government of Canada has responsibilities for the management of listed species such as polar bears where they occur on federal land. The Government of Canada is responsible for managing polar bears and their habitat on federal lands (e.g., National Parks, National Park Reserves, National Historic Sites, National Wildlife Areas, and Migratory Bird Sanctuaries). The Government of Canada contributes to scientific knowledge of polar bears through research and helps to coordinate polar bear management across the country. Canada is signatory to the 1973 Agreement on the Conservation of Polar Bears and is responsible for coordinating international management actions for polar bears, with the advice of the wildlife management boards and jurisdictions. ECCC is the lead government agency for implementation in Canada of CITES through WAPPRIITA, and for implementation of the 1973 *Agreement on the Conservation of Polar Bears.* Environment and Climate Change Canada's Enforcement Branch - Wildlife Enforcement Directorate, is responsible for enforcing laws that protect and conserve migratory birds and protect habitats and species at risk under federal mandate.

Environment and Climate Change Canada and the Gouvernement du Québec (represented, at the time, by: the ministre des Ressources naturelles et de la Faune, the ministre du Développement durable, de l'Environnement et des Parcs, the ministre de l'Agriculture, des Pêcheries et de l'Alimentation and the ministre responsable des Affaires intergouvernementales canadiennes et de la Francophonie canadienne) entered into a cooperation agreement for the protection and recovery of species at risk in Québec in 2012[103]. The purpose of this agreement is to establish the methods by which the Parties will coordinate their activities in relation to the protection and recovery of species at risk of common interest and their habitats and will collaborate in order to avoid duplication. Its purpose is also to encourage the exchange of information and to improve knowledge about species at risk and wildlife species.

7. Threats to the Conservation of Polar Bears

7.1. General Overview of Conservation Threats

In developing a polar bear management plan, it is important to consider all known, anticipated, or possible threats to polar bears, including all human caused mortality and removals. This section provides an overview of the known threats at play within the management plan area, or those that are anticipated to occur within its initial 10-year period of application. The threats presented below were not ranked by order of priority during community consultations, as such they have been listed here in alphabetical order.

Although each issue is described individually, and while investigations into the effects of a project typically focus on local, direct effects, it is important that their cumulative effects be considered by policymakers, especially as northern communities continue to grow. Cumulative effects are changes that are caused by a project-specific action when the effects are combined with other past, present and future human actions. Cumulative effects can occur in several ways but one of the most common forms is associated with development and arises whereby one particular project induces other projects to occur. While it is difficult to tease out climate induced pressures, these should not be overlooked during cumulative impact assessments.

7.2 Development

7.2.1 Hydroelectric Development

Northern Québec, particularly the James Bay region, is well known for the La Grande hydroelectric complex. However, a number of other river systems are identified as having strong hydroelectric potential; these could be developed in the future as energy demands (within or outside of the region) increase[104].

Flow modifications in the James Bay and Hudson Bay watersheds have significantly changed the timing and magnitude of freshwater discharge into the bays. Because water is stored in reservoirs during the spring and summer for release in fall and winter (when energy demands are highest) these hydroelectric developments have reduced the intensity of the spring freshet and resulted in the flattening of the annual hydrograph, when compared to naturally flowing rivers[105–107]. While there have been numerous predictions about the consequences that such changes would engender within the marine ecosystem[108–111], the impacts of hydroelectric development are complex and discerning them from naturally occurring phenomena is difficult[112] and very few studies have actually assessed the direct impacts related to hydro development[113,114].

That said, Inuit and Cree communities in James Bay and Hudson Bay have raised numerous concerns about the changes in sea ice dynamics that have arisen since the 1970's and their impacts on wildlife and wildlife habitat. They have observed direct linkages between the changes to oceanographic parameters within James and Hudson Bays and changes in the frequency of wildlife ice-entrapments, the texture of sea ice and the quality of wildlife habitat (e.g., disappearance of eelgrass beds[114]). The observed change in surface salinity has also been attributed to reduced buoyancy in polar bears and ringed seals, who must now expend additional energy to stay afloat. On the other hand, hunters from Inukjuak have reported that the dams led to an increase in open-water areas during winter (because of changes in currents), which provides polar bears a better access to ringed seals[115].

7.2.2 Natural Resource and Infrastructure Development

Many mineral deposits in the sub-Arctic and Arctic remain undeveloped due to the lack of infrastructure (*e.g.,* inexpensive and abundant electricity, roads, and ports to bring in supplies and ship out the ore). Other deposits have yet to be discovered owing to the remoteness of the region, the cost of exploration and challenges associated with developing a deposit in the region. Once a mine is built, the associated infrastructure may then be used to develop other nearby mineral deposits. This can lead to cumulative effects on wildlife and their habitat. These effects can take on many forms including habitat destruction and animal/human interactions.

In addition to development occurring in neighbouring jurisdictions, there are two operating mines within the Québec range of polar bears as of 2015[116,117]. The Raglan Mine has been in operation since 1997 and the Nunavik Nickel shipped its first load of ore in 2014. Both are located in the Deception Bay area, within Hudson Strait. There are other known mineralized areas in coastal Québec, and likely additional as yet undiscovered resources that could be developed in the future. Northern Québec and the adjacent offshore is a vast remote area and much of it has yet to be explored using modern technologies. Furthermore, as global demand and commodity prices increase, mining and processing technology advances, and infrastructure becomes more widespread, interest in mineral development will increase. What qualifies as a mineral occurrence today could become a mineral resource in the future. According to "The Plan Nord toward 2035 – 2015-2020 Action Plan" released by the Gouvernement du Québec in 2015, many investments and the development of the mineral and energy potential of Northern Québec are expected in the upcoming years. The extent of the impacts of such development on polar bears habitat is difficult to predict.

To date most exploration and mining has been inland[116], outside of the most frequently used polar bear habitat, and there has been no documented evidence of negative impact on polar bears. That said, given the general absence of roads in the region, most mines will construct Infrastructure from the mine to the coast and rely on ships to supply fuel and equipment to the mine and transport the ore to market. Such infrastructure within the range of the polar bears has the potential to impact polar bears if not managed appropriately. The effects of an individual project may be less significant but, when taken into consideration along with other projects or activities in an area, the cumulative effects can become more significant. It is important therefore to take into account the impact of exploration and mining projects, and all other associated impacts within the area occupied by a polar bear sub-population.

7.2.3 Shipping

The potential consequences of shipping on polar bear are numerous and occur as both direct impacts and indirectly via impacts on prey species (i.e. whales, seals, etc.)[118]. The noise associated with passage of a ship can in itself disturb wildlife in the vicinity of the vessel, particularly during icebreaking activities when disturbance is at a peak. Noise associated with shipping and icebreaking have the potential to alter marine mammal behavior and can mask biologically significant sounds by disrupting their hearing and vocalization abilities[118–120] . During the ice-free season polar bears tend to be on land or close to shore so the potential for shipping to disturb polar bears is confined to these areas. In periods of extensive ice cover, bears can be observed far from shore, hence the likelihood of ships encountering bears is greater. Under such circumstances shipping may pose a direct threat to polar bears via the possibility of ship strikes, which are also a threat to polar bear prey species, or by causing family groups to become separated. Ice-breaking can also affect the survival and habitat use of ringed seals, and may influence the distribution of their

birthing lairs and disrupt mother-pup linkages[121–125]. Since ringed seals represent a crucial food resource for polar bears, they could be indirectly affected by such impacts.

Given the relatively low frequency of shipping in ice-filled waters to date, within the management area, routine shipping is of little concern to the polar bear. However, given that the number of shipping transits has increased substantially in recent years[117], it is safe to assume that community and natural resource development will lead to a further increase in seasonal shipping and possibly year round activity in the future. As vessel traffic increases, the likelihood of wildlife disturbances can also be expected to increase so the potential effects of such activity would need to be carefully examined and mitigation measures may need to be put in place.

With shipping comes the potential for unanticipated events such as collisions and groundings on shoals. There can also be fuel spills during the transfer of fuel from a vessel to an onshore fuel storage tank. These situations can, if bears are in the vicinity, lead to them becoming covered in oil. Research has shown that such incidences can lead to mortality[126].

7.2.4 Tourism

Tourism brings more people into areas frequented by polar bears, which can lead to increased disturbance and harassment of the bears, and an increased likelihood of human-bear interactions.

Tourism can be both land-based and marine-based. It can involve individual tourists who travel on their own or in very small groups. They could be hikers or people in kayaks or other small boats. Large groups of tourists may also visit an area at one time (e.g., in one or more tundra buggies or on a cruise ship). While tourist-related activities tend to be confined to particular areas and times of the year, they are often planned so as to maximize the likelihood of bear encounters and photographic opportunities. For this reason, the chances of human-bear interactions and disturbance of the bears are elevated by tourism activities. These effects on their own may not have a major impact on the bears, but when combined with other activities or stressors, the impacts can become serious[127].

As of 2022, tourism within the region is relatively limited, but as more infrastructure becomes available (e.g., access roads, better airport and harbour facilities, more frequent flights and a longer ice-free shipping season) and communities seek out this economic opportunity, the industry will likely grow. The Cree Outfitting and Tourism Association (COTA) has been actively exploring (2015 – 2017) and evaluating the potential for tourism development based on polar bear viewing, with a particular emphasis on the Twin Islands in central James Bay. COTA's interest in this matter is prompting a critical appraisal of the implementation of polar bear tourism in the Eeyou Marine Region south of the NMR.

It is important to bear in mind that bringing more tourists into the north increases the potential for human-bear conflict and that this can put people's lives at risk, if not properly mitigated[128]. It can also lead to increased bear mortality as a result of the need to protect tourists. It is important to minimize the risks to both people and bears associated with this activity. This can be done in several ways including public education, requirements for trained bear monitors and the development/availability and use of bear deterrent measures (e.g., stun guns, cracker shells, pepper spray and portable electric fences around campsites).

Little is known about the long term effects of polar bear viewing in specific locations where bears are known to congregate[127]. Some people have suggested that the bears in these areas become habituated

to the sight of humans and lose their fear of people. If true, this could lead to increased human-bear conflicts.

7.3 Pollution and Contaminants

Arctic marine mammals acquire chemical contaminants through their diet. Polar bears, being at the top of the Arctic marine food chain, accumulate one of the largest contaminant loads amongst all Arctic marine mammals. The Arctic marine environment has a high-fat food web and the great majority of persistent organic pollutants (POPs) accumulate in the fat of all Arctic animals. Most of these chemicals are highly persistent and continue to build up in the animals throughout their lifespan. The chemicals found in polar bear tissues are complex, with over 250 chemicals having been detected. These include POPs such as polychlorinated biphenyls (PCBs) and chlorinated pesticides as well as brominated flame retardants (BFRs) and perfluoroalkyl substances (PFASs). Redistribution of accumulated POPs to target organs such as the liver due to mobilization of fat reserves during fasting and starvation is of particular concern. Although POPs have been detected in tissue samples of all polar bears examined throughout the Arctic, polar bears from the Canadian Arctic appear to have lower chemical loads than elsewhere. As of 2016, Canadian researchers funded by the Northern Contaminants Program are at the early stages of comprehensively establishing spatial and temporal trends of chemical contaminants in polar bears of the Canadian Arctic[129].

A high contaminant load in polar bears might impact their hormonal and immune systems and potentially can affect growth, development, reproduction and resistance to diseases; subsequently lessening their survival ability in face of other environmental challenges. Despite high contaminant loads often reported in polar bears, it is difficult to verify a direct link between contaminants and the survival of polar bears at the present stage of research[130]. Some studies reported correlations between contaminant loads and occurrence of physiological and morphological anomalies such as weakened bones and decreases in levels of certain antibodies in blood and changes in vitamin levels. However, the cause-effect relationship between these observations and contaminants has yet to be established. At this point, no neurological or behavioral manifestations of polar bears in the wild can be indisputably attributed to chemical contaminant exposure. Because of the iconic status of the polar bear and the intense media attentions on the subject, implications of subtle changes detected at biochemical and molecular levels are often loosely extrapolated to predict serious adverse effects on the survival of the species.

Within the management plan area, there is a considerable knowledge gap as far as contaminant research is concerned in comparison with the rest of the Canadian Arctic. Mercury is the only metal contaminant that also biomagnifies up food chains like POPs. The target organ of mercury toxicity is the central nervous system. The only published study of contaminants in Nunavik polar bears[131,132] studied the effects of mercury exposure on polar bear brain chemistry and found that mercury concentration in polar bear brains was over 600 times lower in Nunavik than on Eastern Baffin Island.

7.4 Parasites and Disease

Although infectious agents such as parasites and disease can have important effects on the health of individual animals and at the population level, very little research has been directed at understanding their epidemiology and ecological significance in polar bears[133]. That said, polar bears are known hosts for zoonotic parasites such as *Trichinella* and *Toxoplasma* [134–136] and to a variety of other diseases[133] including rabies[137] and canine distemper virus[138], many of which can have impacts on human health if polar bear

meat is consumed without proper preparation or individuals are exposed to a virus through human-bear interactions.

It is possible that a warming Arctic environment will increase the number of pathogens that polar bears are exposed to, in the management plan region, through mechanisms such as range expansion or increased polar bear density, resulting from reduced habitat during summer. It is also anticipated that, as more invasive species occur in the region, and as new pathways for pathogen transmission are opened up, polar bears will be increasingly at risk of higher prevalence of parasites and disease[133,139–142]. The impacts of parasites and diseases may also be exacerbated by the other pressures (shipping, habitat loss, dietary changes, pollution, etc.) facing polar bears[140].

7.5 Climate Change

In addition to observed trends[143,144], climate models are used to create projections of future climate scenarios. They utilize historical data to predict what changes in climate may be anticipated in the future, and usually they predict a range of scenarios. Although climate models are generally accurate at predicting near-term changes, their predictive ability decreases the longer they project into the future; they are also of limited use when used to predict precipitation patterns[145]. Despite the limitations of climate models, almost all models currently being employed indicate a warming of the Arctic in the near to long term[146,147]. Many Inuit and other northern inhabitants have already noticed these changes taking place[148]. Along with warming temperatures, one of the other consistent predictions of the climate models is an increase in the variability of weather patterns, which Inuit have also witnessed in the last 15-30 years[145,148].

Many scientists consider climate change to be the most critical long-term threat to polar bears and their habitat[67,77,149–151]. Projected warming over much of the polar bear's range and associated reductions in the thickness, duration and extent of sea ice will have both direct and indirect effects on polar bear. Direct effects could include loss of habitat (i.e. extent and composition of sea ice) whereas indirect effects could include ecosystem-level changes affecting the availability of prey species[152]. Earlier melting of sea ice in the summer and later formation of sea ice in the fall will likely also result in greater reliance by bears on terrestrial coastal areas[153,154]. However, habitat changes are not necessarily associated to a reduction in the carrying-capacity of polar bear habitats. For instance, loss of multi-year ice is usually accompanied by an increase in annual sea-ice, and annual sea-ice is thought to be more optimal habitat for polar bears[150,155]. As well, variability within each ecosystem means that some years will be more productive for polar bears than others, and although there might be a general trend towards warmer temperatures and less sea-ice, ecosystem responses and trophic relationships are currently poorly understood.

In addition to habitat alterations noted previously, climate change is also expected to influence the energy budget of polar bears as the abundance of prey species and access to them changes. It is generally accepted that ringed seals predominantly hunted from a sea ice platform constitute the bulk of polar bear diets in many parts of their range[36,41], and that bears rely heavily on accumulated energy reserves to survive the ice-free summers that occur within the management plan area. That said, it is known by the Crees and Inuit that polar bears can effectively hunt seals in open water, this behavior has rarely been documented[51] so its contribution to the annual energy budget of polar bears is not well understood. It should be noted that polar bears in Davis Strait rely less heavily on ringed seals and have a higher proportion of harp seals in their diet than any other polar bear subpopulation[21].

Reduced ringed seal foraging opportunity may also result from impacts of climate change on the seals themselves. Although there is some uncertainty regarding how ice-dependent prey species (i.e. bearded seals, ringed seals, walrus, etc.) will respond to changes in snow and ice conditions, an overall reduction in their abundance is expected[152,156].

Although polar bears are known to forage on a multitude of other prey species[36,37,49,50,115,157,41–48], their ability to compensate for a reduced availability of ringed seals by increasing their take of other species remains contentious among scientists and the full effects of a shift in polar bear diet due to climate change are currently unclear[158–160].

Climate change could also affect polar bear maternity dens. Within the region covered by this management plan, female polar bears den on both the offshore islands and onshore, and create dens in large snow drifts or by excavating soil and peat. Increased variability of temperatures and precipitation could damage the structural integrity of these dens under certain conditions[153].

7.6 Unsustainable Harvests

Harvest management represents a critical requirement for the long-term maintenance of healthy wildlife populations. While the current informal management system has been sufficient to manage the polar bear harvest in the past, changes in current practices and realities have to be considered and the management of wildlife resources have to be adapted to the present situation. Communities are growing, hunting equipment is modernized and the harvest of polar bears from the region has seen high variability over the past decade.

These facts, along with the greater uncertainty of the effects of other threats facing polar bears, suggest that the risks of attaining unsustainable harvest levels could increase over time. Proper monitoring and management of the resource are therefore essential to ensure that polar bears will remain available for use by future generations of Crees and Inuit. This, while taking necessary steps to avoid human/bear conflicts in this ever-evolving landscape.

8. Management Challenges

8.1 Research and Monitoring

The conduct of scientific research and the documentation of tradition knowledge are the cornerstones of sound polar bear management. Although both fields have undergone significant changes in recent years, they continue to face a number of challenges and criticism of research techniques is common in each.

In the case of Traditional Knowledge studies, there has been a marked effort to ensure that research results will be considered as more than anecdotal accounts and rather as valid representations of a knowledge system[161]. More structured and replicable study methods, including pre-study community consultations, reflective development of interview guides, and rigorous post-analysis validation and verification workshops with participants have allowed Traditional Knowledge to be assessed quantitatively and viewed as a valuable source of reputable information[162–164]. Traditional Knowledge study methodology continues to grow, with many researchers using spatial methods, such as participatory mapping, to aid in the transmission of knowledge beyond interviews and questionnaires[165,166].

For scientific research the obstacles have been different. For many years, Inuit communities have been opposed to the handling of polar bears for research because doing so is directly at odds with their fundamental values, of which respect for wildlife is paramount. Most Inuit view invasive research on animals as a form of disrespect to the animal. Because Inuit consume the polar bears that they have harvested, the use of tranquilizers also directly affects food security since most hunters and Inuit families will not eat a polar bear that has previously been drugged. Hence, for Inuit the harm associated with handling polar bears often outweighs any knowledge gains. Conversely, for the scientific community, capture and handling is seen as the most reliable means (and in some cases the only way) of collecting biological information, especially as it relates to research on body condition and survival, or for habitat and movement studies. As such, the effects of capture are often considered acceptable relative to information needs and the risks posed by harvesting[167]. This divergence between the two perspectives has often led to frictions between the scientific community and Inuit but has also led to innovative and less intrusive scientific research methods (e.g., aerial surveys, biopsy darting, hair snags, etc.). Given these issues, it is important to review some of the facts surrounding the various research methods and the consequences of moving towards less intrusive techniques.

One of the major research-related concerns raised by Inuit communities has been the use of immobilizing drugs during physical mark-recapture and telemetry studies which leads to the wastage of polar bear meat, because most Inuit consider it unfit for consumption due to fears of contamination and/or a different taste[38,115,168]. While few studies have directly assessed the withdrawal time for immobilizing drugs in polar bears, one revealed that Telazol® was almost entirely cleared from the body within 24 hours but that some metabolites remained at very low levels for an indeterminate period of time[169]. Health Canada had originally recommended a 1-year waiting period before consuming the meat from a polar bear that had been immobilized[170], but later revised this time frame to 45 days after a review of the scientific data and extensive consultations, consistent with the withdrawal period recommended by the United States Centre of Veterinary Medicine. Any animal immobilized using Telazol® must therefore be identified by some external marker that indicates the date of the latest treatment with the drug. Despite these guidelines, most Inuit will refrain from eating a polar bear if it has ever been chemically immobilized.

Hunters have also reported physiological and/or behavioural changes in bears that have previously been handled by researchers, especially those having been marked with collars or ear tags, and call for the use of less invasive methods[38]. In contrast, assessments of the impacts of chemical immobilization on the movement rates of polar bears found that movement patterns generally returned to normal within a few days after capture[149,171], though for some bears it took up to 21 days before normal movement patterns resumed[172]. A similar study on grizzly bears and black bears found that their movements were reduced for 3-6 weeks after capture and that, individuals having been captured on multiple occasions had poorer body condition than bears of the same age that had been capture on only once[173]. While this suggests long-term effects of capture and handling may also exist for polar bears, recent findings indicate that this is not an issue in the southern Beaufort Sea subpopulation[171].

In response to the concerns expressed about chemical immobilization by aboriginal groups, and also to address the logistical complexities of carrying-out physical mark-recapture studies in some parts of the Arctic, significant effort has been dedicated towards developing less invasive monitoring techniques. For example, hair samples provided by hunters, or those that have been collected with the use of hair snags have proven useful for studying stress levels in polar bears[174] and show promise with regards to genetic

mark-recapture studies[52,175]. More significantly, population estimates in most areas have evolved from physical mark-recapture to the less invasive methods of genetic mark-recapture (using biopsy darts and samples of meat collected by hunters)[176] or aerial surveys[177,178]. These methods can also be used to obtain limited information on body condition, litter size, and cub survival rate but provide considerably less information than traditional mark-recapture studies[167].

8.2 The Human Dimension

8.2.1 Harvesting and Harvest Management

At the time this document was prepared, there was no formal polar bear management system in place within the management plan area. However, a set of regulations (hereinafter referred to as the 1984 Anguvigaq Polar Bear Regulations) developed by the Anguvigaq, at a meeting with the Gouvernement du Québec (the then Ministère du Loisir, de la Chasse et de la Pêche) has played a significant role in shaping polar bear hunting practices since the 1980's. Indeed, Nunavik Inuit presented a series of polar bear regulations to the HFTCC, in 1984. The HFTCC unanimously supported these regulations, yet this did not translate to the adoption of formal regulations by the Gouvernement du Québec, thereby maintaining the voluntary nature of the regulations.

Among other provisions, the regulations set out harvesting seasons, prohibits the harvest of cubs or females with cubs (although cubs were traditionally harvested for their more tender and better tasting meat) and prohibit the disturbance of denning bears. In addition to this, polar bear harvesting is guided by the age-old stewardship practices that require hunters to take only what they need, and to always show respect to animals with whom they share the habitat.

1984 Anguvigaq Polar Bear Regulations

1. That a closed season on polar bear hunting be in effect from June 1st to August 31st.
2. That female bears with cubs not be killed at any time of the year unless they are problem bears.*
3. That polar bears not be killed in their dens. Further, that no one, including scientists and Inuit, disturb a bear in its den unless authorized after consultation with Anguvigaq Wildlife Management Inc. and review by the Hunting, Fishing and Trapping Coordinating Committee.
4. That polar bears less than 2 years old not be killed at any time of the year unless they are problem bears.*
5. That polar bear cubs not be sold to any person or organization unless authorized after consultation with Anguvigaq Wildlife Management Inc. and review by the Hunting, Fishing and Trapping Coordinating Committee.
6. That the responsibility for issuing polar bear tags to Inuit hunters rests with the local government municipal corporations in northern Québec.
7. That the moratorium on drugging polar bears in northern Québec be continued.
8. That each Inuit community will recognize the right of all other Inuit communities to harvest polar bears and will continue to help each other in matters relating to polar bears.

* Problem bear is defined as any polar bear that is a threat to life or property.

Harvest management involves the use of various rules and policies to achieve pre-determined management objectives that have been established based on the abundance of a population, carrying-capacity of the habitat, safety concerns, etc.). It can include tools such as seasonal limits, protection of certain segments of the populations (e.g., females and cubs) or the imposition of a limit on the total number of individuals that can be removed from the population. Harvest management also includes the distribution of the products of the harvest among the various users.

The challenge with implementing such a comprehensive management system in Nunavik is that the region's primary experience with a formal management system (implemented since the 1980's for beluga whales) has been highly controversial and with profound impacts on Nunavik Inuit[179]. As a consequence, Nunavik Inuit are generally wary whenever there are talks of implementing harvest restrictions for polar bear, as they worry that similar circumstances will arise. A primary concern relates to possible impediments on the transfer of knowledge and on use of traditional hunting areas, resulting in a young generation without a full complement of land skills. Further, the imposition of quotas is believed by many Inuit to have inadvertently caused an increase in harvesting pressure as hunters have rushed to fill quotas and maintain their access. During interviews with Nunavik Inuit, there was widespread concern that the implementation of a quota system for polar bear may have the same unintended effects[38,115].

8.2.2 Changing Communities

In recent times, the communities of Northern Québec have undergone, and continue to undergo, a number of significant changes[180]. Aside from the drastic changes that came with a more sedentary way of life, today's communities are experiencing rapid population growth. The region's birthrates are among the highest in the country and the demographic structure has shifted to one dominated by youth[181]. Unfortunately these changes have not been accompanied by an increase in job opportunities and social issues are numerous[182]. The extremely high cost of living, driven by high prices for food, fuel and equipment, is one of the main hardships faced by residents in many communities[183,184]. Despite these significant changes, subsistence harvesting has persisted as one of the most important threads of society. It allows for a source of healthy nutrition and instills a source of pride and fulfillment to the harvesters.

The modernization of equipment has impacted harvesting practices in Northern Québec. Modern equipment such as snowmobiles and all-terrain vehicles has improved access to wildlife and, along with more technologically advanced firearms, has, in some sense, made harvesting more efficient. However, the high costs associated with this equipment means that such hunting practices have become unaffordable for many Inuit and Crees.

8.2.3 Defence of Life and Property

Although Crees and Inuit have co-existed alongside polar bears for millennia, their interactions have been changing in recent years to the point that they no longer feel safe while camping on the land[38,115]. The changes to communities, noted above, are one of the key factors driving these conflicts. Growing settlements and changing lifestyles have certainly created conditions in which there is a greater likelihood of encounters between humans and polar bears. Among these factors are the growing number of cabins/tents on the land, growing landfills and, generally, a greater human-presence. In the case of Inuit and Crees, the advent of snowmobiles means that protection from polar bears by dog teams is no longer a reality for most people when they travel outside their community.

That said, Inuit and Crees continue to feel that many of these encounters are the result of a significant increase in the number of polar bears present in the region compared to the 1950's and 1960's. Polar bears are now a regular occurrence in areas where they were once a rarity. Lengthening of the ice-free season means that polar bears spend more time on land, which also increases the likelihood of encounters; according to the projected climate change scenarios, this is a problem that is likely to worsen. The depredation of seabird/waterfowl colonies by polar bears has become a regular occurrence[185] and, given the importance of these colonies (e.g. eggs, feathers, meat, etc.) to the subsistence of Inuit and Crees, is likely to lead to increased human-bear encounters. Their inquisitive nature means that polar bears are naturally drawn to human settlements (camps, cabins, communities, butchering sites, etc.), and therefore towards situations of possible conflict. In addition to a number of known attacks on humans, the destruction of cabins, food caches, and equipment by polar bears is a growing concern. Some hunters have noted that bears are more aggressive in recent years, so what may previously have been a harmless encounter may now be deadly (for humans and bears). During interviews, many Cree hunters and trappers have mentioned a strong increase in presence of polar bear, as well as their distribution area expanding south. This has led to an increase in human-bear conflicts over the last decades, more dramatic in the last few years. Many mention changes in behaviour as well, as the polar bear seems to come more to shores and more inland, presumably because of changes in ice conditions and/or availability of food sources. Should bears become nutritionally stressed in the future, these problems are expected to be intensified.

Conditions are such that human-bear interactions have become unavoidable and are a key consideration and priority in the management of polar bears, for both Crees and Inuit. As well, an increased human presence in the North has resulted from the presence of outfitting camps, tourism operations and mineral prospecting sites (among others) and will continue to grow in the future.

8.2.4 The role of Zoos and Aquariums

The role of zoos and aquariums in promoting wildlife conservation has long been recognized, but it is not without debate; especially concerning matters of ethics and animal welfare. In the case of polar bears, orphaned cubs are occasionally sent to zoos instead of being euthanized.

Placing and raising polar bears in zoos and aquariums provides certain contributions to polar bear conservation. For example, they provide a unique setting for research to be carried out in a controlled environment and could contribute to maintaining a diverse gene pool if wild populations decline. Despite this, Nunavik Inuit (as well as some Cree) have been particularly vocal about their belief that placing polar bears in zoos and aquariums shows a fundamental lack of respect for the animals and disrupts the harmonious balance of humans, animals, and the environment in which they exist. Consequently, many Inuit and Crees are of the view that killing an orphan bear is more humane than sending it to a zoo or aquarium.

Zoos and aquariums also play an important role in public education. Having bears in these facilities enables the general public to view polar bears, learn about their biology and become more familiar with the threats they are facing. While such messaging can encourage public engagement in issues such as reducing greenhouse gas emissions, there is a risk that Indigenous knowledge be under-represented. Indeed, several Inuit were concerned that zoos and aquariums had contributed to mounting public opinion against subsistence harvesting of polar bears.

8.3 Additional Considerations Related to Polar Bear Management

8.3.1 Subpopulation Boundaries

As explained previously, the current polar bear subpopulation boundaries, based largely on movement patterns, mark-recapture and harvest data, are disputed by indigenous harvesters who have a more holistic view of polar bear distribution. Despite significant data on the movements and distribution of female polar bears, males are poorly studied in this regard since they cannot be fitted with satellite collars, due to their large necks relative to their head size. Consequently, it is possible that boundaries are biased by the weight of data obtained from females. Although assessments of population structure based on genetics show some degree of genetic structuring between subpopulations, they also exhibit extensive gene flow amongst them[186–188]. Nunavik Inuit reported common polar bear travel routes that cross sub population boundaries. This includes routes over land across Nunavik, from Ungava Bay to Hudson Bay hundreds of kilometers inland[38,115].

8.3.2 Inter-jurisdictional considerations

Considering that polar bears present in the area of application of this plan are shared with several other jurisdictions, it is essential that management actions by individual jurisdictions are established in a co-ordinated manner for a successful management of the species. The three polar bear subpopulations in the region are shared with Nunavut, Ontario, Newfoundland & Labrador, and/or Greenland as well as falling under the management authority of at least two other wildlife management boards and multiple Inuit and Aboriginal stakeholders. While the management authority of each is limited to the geographical boundaries of their jurisdiction, there are several elements in place that mitigate any adverse impacts this reality might have on achieving the goals and objectives of the present Management Plan.

In the past, when management decisions have occurred, they have usually been taken independently and with little or no coordination with other jurisdictions. This has led to situations where management objectives between jurisdictions might not be shared, resulting in higher harvests in some areas than would normally be sustainable. However, since 2010, greater coordination has taken place in the form of user-to-user meetings with stakeholders from all jurisdictions, as well as greater awareness and communication between wildlife management boards in their decision-making processes. Governments, Wildlife Management Boards and Indigenous Land Claims Organizations with management authority for the polar bear subpopulations across Canada (both inside and outside the geographic scope of this management plan) regularly work together through domestic committees such as the Polar Bear Administrative Committee, the Polar Bear Technical Committee, and advisory committees to coordinate their management decisions; international collaboration and coordination occurs mainly via the Polar Bear Range States.

8.3.3 Legislative Issues

The legislative and regulatory frameworks adopted by the competent authorities are the primary instruments used to give effect to management plans. Without legislation and regulations, the restrictions included within a management plan cannot be enforced. Although legislation and regulations currently applicable within the management plan area (see section 5.4, above) allow effective implementation of the plan throughout most of the region, there remain some legislative gaps due, primarily, to the complex jurisdictional framework described previously (see section 6, above).

For example, while social acceptability remains unclear, a number of Inuit hunters have demonstrated interest to explore the option of establishing a polar bear sport hunt in Nunavik as a means to promote traditional skills and values related to polar bear hunting (e.g., dog sledding) and to optimize the economic returns associated with each bear that is harvested in the region. While sport hunting of polar bears could be permissible in the marine regions under the NILCA and EMRLCA, the polar bear is a reserved species for the exclusive use of Native people according to section 24.7.1 of the JBNQA. The *Act Respecting the Hunting and Fishing Rights in the James Bay and New Québec Territories*[90] gives effect to this article of the JBNQA by reserving polar bear for the exclusive use of the Native people. The incoherence between the onshore and offshore regulatory and Land Claims regimes are a clear impediment to the implementation of a polar bear sports hunt within the management plan area.

8.3.4 International Trade

Decisions regarding the allowable trade of polar bears can have indirect consequences on Canada's domestic polar bear management efforts, including those within the management plan area[189]. Decisions on allowable polar bear trade are made internationally under the *Convention on the International Trade in Endangered Species of Wild Fauna and Flora* (CITES), unilaterally by other countries, and within Canada prior to export. A primary consideration in all of these decisions is the sustainability of harvest in consideration of the conservation status of the species. International trade offers a significant source of income to some Inuit and continued trade is therefore an important incentive to adopt enhanced conservation measures, including sound harvest management practices and accurate harvest reporting. Eliminating the potential for international trade would severely reduce this incentive.

Polar bears are currently listed under Appendix II of CITES. As required under CITES, an export permit for an Appendix II species can only be issued once the CITES Scientific Authority of Canada (housed within Environment and Climate Change Canada) has advised that such export will not be detrimental to the survival of that species. This "Non-detriment finding" (NDF) evaluation of sustainable harvest levels is supported by a demonstration of sound harvest management practices and accurate harvest reporting. This NDF evaluation in part, explains the need for elaboration of this management plan.

It should be noted that in recent years, a number of submissions to uplist the polar bear onto CITES Appendix I have been made (but have not been adopted); if adopted in the future, such an uplisting would end commercial international trade of polar bear. The Government of Canada and Inuit organizations have argued consistently that listing polar bear under CITES Appendix I would almost certainly be of minimal conservation value since international trade is not the main driver behind Inuit harvesting. As well, in September 2015 the Animals Committee of CITES determined during the CITES significant trade review process that the current trade in polar bear hides and parts is not detrimental to the survival of the species in the wild. International trade does, however, offer a significant source of income to some Inuit and is therefore an important incentive to adopt enhanced conservation measures.

9. Management Plan Goal and Objectives

The fundamental mechanism of a management plan is to identify a small number of overarching objectives that should be met in order to meet the overall goal of the management plan. The goal of this management plan is to maintain healthy polar bear populations which remain an important component of the local ecosystem and which will be available for use by current and future generations in a way that respects and embodies the rights, culture and traditions of the Nunavik Inuit and the Crees of Eeyou Istchee. This goal applies to the territories covered under the James Bay and Northern Québec Agreement, the Nunavik Inuit Land Claims Agreement and the Eeyou Marine Region Land Claims Agreement. In order to achieve this goal, four objectives have been developed and the plan identifies specific approaches that must be implemented in order to accomplish each of the broader objectives. The objectives and approaches defined below have been developed based on the views collected during public consultations conducted in Nunavik and in the Eeyou Istchee territory, and on an understanding of polar bears, their habitat and the issues facing them in the management plan area.

Objective 1: Establish a management system based on the best available information, which reflects Inuit and Cree values, and adapt it as necessary to ensure the long-term persistence of polar bears in the management plan area.

Approach 1.1: Review and, as appropriate, renew the 1984 Anguvigaq Polar Bear Regulations and all commitments made therein.

As indicated in section 8.2.1, these regulations were developed by the Inuit as a conservation effort to respond to concerns raised by the Polar Bear Technical and Administrative Committees and were subsequently adopted by the HFTCC in May 1984. Crees from Eeyou Istchee were however not involved in their development and many current Inuit hunters have indicated that they are unfamiliar with these regulations. It is therefore necessary to review these regulations to ensure that they are supported by all stakeholders, remain relevant, are in line with the current management plan and that they are consistent with the applicable legislative framework, including the JBNQA, NILCA and EMRLCA. As appropriate, they may become enshrined within the regulations established by the responsible governments, subject to the processes defined in the JBNQA, NILCA and EMRLCA.

Approach 1.2: Base polar bear management decisions upon best available information.

To the extent possible, scientific research, Inuit Qaujimajatuqangit and Cree knowledge should be considered and integrated when population objectives and management measures are established. Ecosystemic considerations related to polar bear habitat and prey should be also taken into account.

To achieve this, they require access to multiple lines of evidence, including those provided by TK holders, academics, government representatives and institutional representatives. Clear policies and/or guidelines for the consideration and integration of science and TK would aid decision-makers in their effort to create a fully representative management system.

Approach 1.3: Revise the harvest registration process with the goal of achieving complete reporting of all human-caused mortality of polar bears.

Historically, within the management area, the registration of harvested bears has been voluntary and restricted primarily to those animals whose pelts or other parts are sold. Bears whose skins were used locally for clothing, or other traditional crafts, may not have been reported.

Independent of population status, the effective management of polar bears relies on the ability to collect accurate and reliable harvest information. Several gaps have been identified within the registration process currently applicable within the management plan area. A structured review of current practices should lead to a strengthening of the existing harvest registration process, or to the implementation of an entirely new system. Ultimately, the objective of this review is to establish a mechanism that ensures the full reporting of all human-caused polar bear mortality within the management plan area, including in defense of life and property.

Approach 1.4: Implement a harvest management system that provides the tools necessary to achieve agreed-upon management objectives and long-term persistence of polar bear populations; these can include mechanisms such as NQLs and TAT.

In contrast to most other jurisdictions that allow the harvest of polar bears, there is currently no formal or legislated management regime within the management plan area. However, based on the principles of conservation, the JBNQA, NILCA and EMRLCA provide mechanisms for the establishment of harvesting regulations, to the extent that they are necessary to maintain vital, healthy wildlife populations capable of sustaining present and future Cree and Inuit harvesting needs.

This management plan does not, in and of itself, establish any quota or non-quota limitations. Instead, it provides the initial framework upon which a formal polar bear harvest management system will be built. Upon completion and approval of the management plan, management partners will review all existing management measures, as well as the best available science, Inuit Qaujimajatuqangit and Cree Knowledge for each polar bear subpopulation. This exercise will allow them to assess the status of each subpopulation and the efficacy of the existing management system, to ensure that harvest levels are sustainable. If a conservation concern is identified, a collaborative effort by all management partners must be made to identify the most appropriate management measures. For certainty, a lack of consensus amongst the management partners about the existence (or absence) of a conservation concern and/or about the proper course of action shall not limit the ability of individual parties to propose management measures.

If the existing management system is deemed to be inadequate and formal modifications to the management regime are necessary, they will be implemented in accordance with the processes defined under the JBNQA, NILCA and EMRLCA[1]. Decisions should be made in accordance with the principles of

[1] As identified within the NILCA and EMRLCA, the establishment, modification or removal of TAT and non-quota limitations, within the EMR and NMR, is the responsibility of the EMRWB and the NWRWB respectively, while remaining subject to final acceptance/rejection/variation by the federal and Nunavut governments. On the Québec mainland, the HFTCC has a responsibility to make wildlife management recommendations to the ministre des Forêts, de la Faune et des Parcs (or only MFFP), including regulations and restrictions on the harvest when necessary. For clarity, nothing in this management plan

conservation and consider the ecologically sustainable harvest rate for polar bears, as well as the quality of available information. They should also consider current and historical harvesting practices (including those outside of the management plan area), as well as the social acceptability of the current polar bear abundance. Finally, management decisions should attempt to strike a balance between conservation and the need to preserve Inuit and Cree harvesting rights, culture and traditions. The table below is intended to provide guidance to management authorities as they determine the most appropriate management actions to be implemented depending on the circumstances observed.

shall limit the ability of these governments and boards to consider any information that they consider relevant to the decisions before them.

Parameter	Status	Management Actions
Population abundance and trend	Population is considered healthy, abundant and appears to be stable or increasing (according to science and traditional/local knowledge).	- Maintain current frequency of population assessments; - Maintain or reduce harvest restrictions to ensure that they do not unduly limit harvesting rights;
	Population status represents a conservation concern[2] (according to science or traditional/local knowledge).	- Increase frequency of population assessments; - Establish or amend harvest restrictions (e.g., TAT, NQL, etc.) to attain lower harvest levels; - Develop educational/hunter information tools; - Take appropriate management actions to address potential causes of population decline (threats) if the primary cause is not thought to be unsustainable harvesting.
Harvest level[3]	Harvesting practices for a given subpopulation allow for the maintenance of vital, healthy polar bear populations.	- Maintain or reduce harvest restrictions to ensure that they do not unduly limit harvesting rights;
	Harvest level for a given subpopulation is not in line with the principles of conservation.	- Establish or amend harvest restrictions (e.g., TAT, NQL, etc.) to attain lower harvest levels; - If due to high number of DLP kills, review and improve the available toolkit (e.g., develop educational tools, establish/amend deterrence programs and community bear plans, etc.);
Reporting of harvest	Harvest reporting is incomplete	- Take necessary measures to ensure complete harvest reporting (educational tools, review and improve registration process, put a regulatory mechanism in place, etc.);
Sex ratio of the harvest	Male:female harvest ratio is consistent with management objectives	- Continue monitoring the male:female ratio through harvest reporting;
	Male: female harvest ratio is inconsistent with management objectives	- Develop relevant educational tools; - Establish NQL to achieve a male-biased harvest or employ some other means to achieve the same objective.

647

[2] Although a population decline does not necessarily equate to a conservation concern, when a downward trend in abundance or in the health/body condition of polar bears is observed or when harvesting practices may compromise the long-term persistence of polar bears, precaution is warranted when determining appropriate management actions.

[3] A sustainable harvest level can vary according to the population objective but must remain in line with the principles of conservation. A 4.5% harvest rate, at a 2:1 male-to-female ratio, has usually been considered sustainable and often allows for the maintenance of stable populations[190]. Because higher/lower harvest rates may be appropriate under some circumstances, numerous factors should be examined to determine the sustainability of the harvest (e.g. subpopulation abundance, vital rates, demographic parameters, environmental conditions, polar bear body condition, etc.).

Approach 1.5: *Annually review all pertinent information to inform adaptive management of polar bears.*

The responsiveness of an adaptive polar bear management system is contingent upon frequent review of the best available information by the management partners and subsequent adjustment of the approach taken. As described in Approach 1.4, information relative to the abundance, harvest and health of polar bears, among others, should be reviewed annually, or whenever significant new information becomes available. Annual review meetings will provide an opportunity to set research priorities and to track the implementation, progress and effectiveness of management actions.

Approach 1.6: *Ensure, as appropriate, the protection of young bears and females.*

The 1984 Anguvigaq Polar Bear Regulations included protections for polar bears less than two-years-old. The protection of young bears, who are still dependant on their mothers, aids the recruitment of new individuals into the population and is thereby important to the maintenance of healthy polar bear populations. Mechanisms that continue to ensure the protection of young bears are therefore necessary, except in defense of life and property situations or when there is little likelihood of it surviving.

Sex-selective harvests, whereby females receive added protections, are used frequently by wildlife managers who seek to restore a depleted population or who wish to maximize harvesting opportunities. A number of the 1984 Anguvigaq Polar Bear Regulations were intended to afford such protections to female bears (i.e., regulation 2: protection of family groups, regulation 3: denning polar bears). In part because of these guidelines, female bears have historically not exceeded one third of the overall harvest within the management plan area (a ratio that is consistent with other jurisdictions). Appropriate actions (e.g., hunter education, regulated sex-selective harvest, etc.) will need to be considered if the proportion of females in the harvest increases to unsustainable levels.

Approach 1.7: *Explore the implications and social acceptability of implementing a polar bear sport hunt and, as appropriate, identify the means by which such an activity could be established.*

A number of Inuit communities within Nunavik have expressed an interest to carry-out polar bear sport hunting, whereas others have indicated that no such activity should occur within the management plan area. Sport hunting is seen by some as a means of generating much needed income and as a way to strengthen traditional practices such as dog sledding. On the other hand, the concept of trophy hunting is viewed negatively in many circles. There are also a number of obstacles (including the need to establish a TAT) that must be addressed before a sport hunt can be implemented (see section 8.3.3, above). A clear mandate is needed before significant time and resources are invested towards this enterprise.

Objective 2: Collect Traditional Knowledge and scientific information related to polar bears to inform management decisions.

Polar bear research within the management plan area has historically been limited, in contrast to other jurisdictions. This has changed in recent years as increased inter-jurisdictional collaboration, concerns about the impacts of climate change on polar bears and a push to gather Traditional Knowledge have led to a more concerted research effort.

For sound management of the region's polar bear subpopulations, it is important to maintain this momentum going forward. Doing so will require the use of scientific methods, Traditional Knowledge and continued collaboration between all parties. The identification of clear research priorities,

meaningful involvement of Cree and Inuit in research and timely communication of results back to management authorities will further strengthen the polar bear management system.

Approach 2.1: Ensure coordination and collaboration towards monitoring the health and abundance of polar bears, at a frequency that allows robust decision-making.

All three polar bear subpopulations occurring in the management plan area are shared with neighbouring jurisdictions. Consequently, collaboration with partners in other jurisdictions is important to ensure efficient use of resources as well as the complementarity of research methods and priorities between regions. Discussions regarding the sharing of raw and interpreted data as well as research reports are also necessary to ease the collaboration between management partners.

Continued monitoring of abundance and trends is central to the polar bear management system and must occur at regular intervals that are of such frequency to allow for responsive management actions. A sound understanding of polar bear health will also require collection of information about behaviour, body condition, diet, contaminants, disease, parasites, etc. A dedicated effort from harvesters (e.g. via implementation of a sampling program) will be helpful to offset the loss of biological information stemming from the shift away from more invasive research methods.

Approach 2.2: Document the Traditional Knowledge of Nunavik Inuit and the Crees of Eeyou Istchee to inform research and guide management efforts.

Cree and Inuit harvesters are best positioned to provide a long-term perspective on polar bear abundance and health in the region. Given their ongoing close connection to the land, they are also well-situated to provide current observations related to changes in health, abundance, behaviour of polar bears as well as changes in their habitat. Considering this, it is important to ensure that their knowledge is available and utilized by management authorities.

The first comprehensive effort to document Nunavik Inuit Traditional Knowledge of polar bears, undertaken by the NMRWB, was published in 2018[38] and has provided resource managers access to this wealth of information. A similar effort has also been undertaken by the EMRWB to document Eeyou Istchee Cree knowledge of polar bears in the Eeyou Marine Region[191]. As is the case for scientific research, these traditional knowledge studies should also be regularly updated. The use of traditional knowledge to investigate targeted issues (e.g., identification of important habitat, behavioural studies, etc.) should also be promoted.

Approach 2.3: Improve our understanding of the changes to polar bear habitat, behaviour and interaction with other species and the potential impacts of these changes on polar bears.

The abundance, health and distribution of polar bears is influenced, to a large extent, by habitat quality and prey availability. A thorough understanding of these parameters and timely identification of information gaps is needed to implement effective management measures and a practical set of research priorities.

The effects of climate change on polar bears, within the management area, are not fully understood and merit further investigation if they are to be effectively considered in management decisions. Industrial development and increased shipping activities are also expected to affect polar bear habitat and baseline information towards understanding the impacts of such activities is needed.

It is also important to understand the evolving relationships between polar bears and the species they interact with. Monitoring the health, abundance and trends of seal populations is crucial since they are such an important component of the polar bear diet. Inuit communities have also raised significant concerns about the impacts that polar bears will exercise on migratory bird colonies and consequently, on the traditional practices that depend on them (e.g., harvesting eider down for use in clothing). Due to the northward expansion of black bear range, polar bears are encountering them more frequently and investigation into the potential consequences of these interactions is warranted.

Approach 2.4: Promote and encourage the training and meaningful involvement of Crees and Inuit in polar bear research and management.

As noted previously, Inuit and Cree possess substantial knowledge about polar bear ecology and should be encouraged to participate in the planning, execution and interpretation of research and monitoring programs. Doing so will require effective consultation with local hunters' associations, and greater collaboration, including efficient reporting and iterative feedback, between researchers and harvesters. Reaching a common understanding about research objectives and methods is paramount for both sides.

Because many Inuit and Crees spend a significant amount of time on the land, they are also in a unique position to make observations that relate to the ecology and habitat of polar bears, as well as instances of human-bear conflict. The Cree Nation Government and the Cree Trappers' Association have recently released a mobile application that can be used by the land users to compile details and location of any wildlife observation or harvest. A similar system, known as SIKU, is also used by the Nunavut Inuit. Building local capacity and encouraging systematic monitoring activities and implementing similar processes in Nunavik communities could significantly bolster our understanding of polar bears, guide the establishment of research priorities and be later formalized into a community-based monitoring program.

Approach 2.5: Work towards improving non-invasive research methods and develop alternative means to collect biological information.

Given concerns raised by Inuit communities about the use of invasive research methods, there has been a shift away from such practices in recent years. As a result, abundance estimates are now conducted using aerial surveys or genetic mark-recapture surveys (i.e., biopsy darting); it will be important to refine these methods and explore new ones.

The use of less invasive research methods means that there is less opportunity for researchers to collect measurements and gather biological samples in the field. Alternative means of collecting such information are needed to ensure that the information can be used to estimate parameters such as reproductive success, cub survival, etc. The collection of biological samples by subsistence harvesters provides a unique opportunity to gather such information and can make important contributions to scientific research. In supporting the 1984 Anguvigaq Polar Bear Regulations, the Gouvernement du Québec and Inuit agreed to establish a Québec-wide moratorium on drugging polar bears for scientific research. Because the position of Inuit has not changed with regards to the drugging and handling of polar bears, all parties should consider renewal and affirmation of this moratorium so that it is clear to all. Alternatively, and recognizing the valuable information that can be obtained from marking/collaring bears, it would be important that all parties agree on clear ground rules for the use of invasive research methods (e.g., identify an appropriate consultation process and determine necessary approvals).

Objective 3: Establishing strategies to minimize the effects of human activities on polar bears and their habitat, as well as to reduce human-bear conflicts.

Inuit and Cree have unanimously expressed major concerns about the growing threat posed by polar bears in this region. The number of bears entering communities and camps has increased and there are evident concerns for public safety, which must be addressed within this management plan.

On the other hand, it is also important to limit the negative impacts that human activities will have on polar bears. An increased human presence in the territory (due to tourism, industrial development, and shipping) can have detrimental effects on polar bears, their habitat and their prey.

Approach 3.1: Document all instances of human-bear conflicts.

Complete documentation of instances of human-bear conflict is necessary to provide management authorities with a full understanding of the issue. Given the frequency of such encounters, it is essential to promote public education and awareness about any reporting system that may be put in place. The proper reporting of all bears harvested in a defense of life and property situation will also be essential. This information will become useful to evaluate the effectiveness of deterrence and mitigation measures.

Approach 3.2: Develop programs and tools aimed towards reducing human-bear conflicts within the management plan area to increase public safety while reducing the number of Defense of Life and Property kills.

Public safety, due to the increased presence of polar bears, has become a major concern for many Inuit and Cree communities. Communities must be encouraged to develop plans to address these concerns and should be provided with the tools necessary to implement them. Such measures could include the establishment of polar bear patrols in high-risk areas, increased public education about bear safety, and public availability of polar bear deterrents. Regional means of addressing the issue (e.g., damage prevention/compensation programs) should also be explored.

Approach 3.3: Clarify the rights and obligations of Inuit, Cree and non-beneficiaries in respect to defense of life and property kills and provide clear guidance on the steps that must be followed when such circumstances arise.

The preservation of human life and property is clearly recognized in the Land Claims Agreements and a guiding principle of this management plan. It is important that this be clearly understood by anyone likely to encounter a polar bear.

That said, the NILCA and EMRLCA include provisions related to the take of polar bears in DLP which have yet to be fully implemented, particularly surrounding the disposal of valuable parts and reporting of polar bears killed in DLP. Clear and practical guidelines aimed at implementing these provisions and establishing a consistent process for dealing with DLP kills throughout the management plan area is needed.

Approach 3.4: Promote the respect and ethical treatment of polar bears by all users.

Polar bears are highly revered by the Inuit and occupy a large place in their culture and traditions. The Cree show a similar respect towards polar bear. For both peoples, it has always been extremely important to demonstrate the utmost respect for wildlife; a notion that remains deeply entrenched in

modern values. A number of ethical principles and traditional rules extend from this relationship with polar bears; it is important that everyone who visits Northern regions become sensitive to this reality and the fact that management actions also be guided by these values.

For example, Nunavik Inuit have raised serious concerns about the possibility of polar bear cubs being sent to zoos when they are orphaned. While many see this as an appropriate means of saving a polar bear cub, doing so is unethical from the perspective of Nunavik Inuit; the Cree of Eeyou Istchee share similar concerns. These concerns should be taken into account in cases when cubs are orphaned and a decision needs to be made.

Approach 3.5: Minimize the impacts of industrial development, shipping, tourism and other anthropogenic activities on polar bears within the management area.

There is a growing interest to develop economic ventures in the region, many of which can negatively impact polar bears. It is important to understand the scope of these activities and the threats they pose, as well as to identify approaches to minimize them.

For instance, there is a need to identify sensitive polar bear habitats for which particular protections and stewardship measures may be necessary, or which may require special consideration during the evaluation of potential development projects. Establishment of industry guidelines and best practices will also help to thwart possible detrimental impacts from these emerging activities.

The impacts of hydro-electric development on polar bears, their prey and the sea ice are a concern to Inuit and Cree. Given the region's existing hydroelectric infrastructure and its strong potential for new projects, it is important to gain a better understanding of implications, particularly the impacts on polar bears, their prey and the sea ice.

Objective 4: Collaborate, coordinate, communicate and promote the exchange of knowledge and information related to polar bears.

The exchange of knowledge and information will play a determining role in the effectiveness of this management plan and, generally, in the conservation of polar bears. Ambiguity with regards to rights and responsibilities will generate frustration and disagreements. Failure to transmit the knowledge of elders to the youth will create an immense gap in the local stewardship effort.

Approach 4.1: Foster the transmission of traditional knowledge between elders and youth.

The region's youth is expected to play an important role in the future management and stewardship of polar bears. Because lifestyles are changing rapidly, it is more important than ever that Inuit youth be taught the knowledge of their elders. A variety of approaches should be explored, such that the knowledge of elders, as it relates to polar bear, is available to the benefit of future generations of Inuit and Cree.

Approach 4.2: Strengthen the two-directional flow of information between community members, researchers, management authorities and other relevant stakeholders.

Gathering scientific knowledge and documenting traditional knowledge is not sufficient to ensure an effective and responsive polar bear management system. This is particularly true in a system founded upon both scientific information and traditional knowledge. To be truly effective, there must be clearly established channels of communication such that all parties are basing their decisions and positions on the same information. Significant effort, from all parties, is needed to develop a communication strategy that addresses difficulties posed by language barriers, capacity issues and historical grievances.

Approach 4.3: Create a permanent forum wherein information and best practices related to polar bears can be discussed, and which will facilitate the coordination of polar bear management by the relevant parties.

The present management plan was born from a collaborative effort amongst all organizations with a role in polar bear management within the management plan area, via the Québec – Eeyou Marine Region – Nunavik Marine Region Polar Bear Working Group. This forum allowed close collaboration and candid exchanges between all parties and was a highly effective means of advancing this process. Maintaining this structure, or creating another that is similar in nature, will be a useful means of addressing many of the issues raised herein.

Approach 4.4: Enhance collaboration with other jurisdictions to guide polar bear management on a national and international level.

Management efforts within the region affect, and are affected by, activities and actions taken in neighbouring jurisdictions, nationally and internationally. Effective communication about the management system is necessary to ensure effective conservation of polar bears across their range. Participation by regional representatives to various forums, conferences and committees (i.e., PBAC, PBTC, Polar Bear Range States, CITES, etc.) aids towards this goal and should continue.

The effective management of the shared subpopulations discussed in this Management Plan requires significant inter-jurisdictional coordination and communication. For this to happen, it is essential that information be readily available to all parties and that harvesters from all relevant regions be afforded a forum to exchange their views about issues that will ultimately inform management decisions (e.g., status of polar bear subpopulations, management objectives, allocation of the harvest, etc.). Similarly, it is essential for management authorities (at all levels) to maintain frequent dialogue to ensure that there is alignment in their research and management priorities, in the population objectives upon which their management actions are founded and, importantly, in the timing of any decision-making processes for shared subpopulations. Whenever a decision is made that influences the total harvest within a subpopulation that is shared by multiple jurisdictions, prior discussion and coordination between decision-makers is useful to establish a common vision of the overall objectives sought and to ensure compatibility of the actions taken to achieve them. Finally, all parties should work collaboratively to identify and address any legislative, regulatory or policy gaps that stand in the way of the effective and efficient implementation of management actions.

10. Proposed Actions for the Management of Polar Bear in Québec, EMR and NMR

The following table presents the concrete actions that will provide a means of attaining the management objectives presented within this management plan. Because the Polar Bear Management Plan for Québec, the Eeyou Marine Region and the Nunavik Marine Region is the first comprehensive management plan for polar bears to ever be developed in the Management Plan Area, further dialogue with Nunavik Inuit and the Crees of Eeyou Istchee will be necessary to prioritize and implement management actions. Therefore, once the management plan has been approved by all relevant authorities, management partners will develop, in a timely manner, a companion document in which lays out a framework for action including an implementation table that sets out specific timelines for action to address the threats and information gaps according to subpopulations listed below. The table will provide the basis for an implementation agreement among management partners. The following actions will be implemented over the course of the management plan and may be updated as necessary to reflect any changes that occur.

Proposed Actions for the Management of Polar Bear in Quebec, the Eeyou Marine Region and the Nunavik Marine Region	
Objective #1: Establish a management system, based on the best available information, that reflects Inuit and Cree values and that can be adapted as necessary to ensure the long-term persistence of polar bears in the management plan area.	
Approach 1.1	***Review and, as appropriate, renew the 1984 Anguvigaq Polar Bear Regulations and all commitments made therein.***
▪ Action 1.1.1	Review the commitments made under the 1984 Anguvigaq Polar Bear Regulations and identify changes needed to align these commitments with present-day realities.
▪ Action 1.1.2	Formally recognize/adopt revised regulations, as relevant for each of the management partners and, where appropriate, have them enshrined in formal regulation by the responsible governments.
Approach 1.2	***Base polar bear management decisions upon the best available information.***
▪ Action 1.2.1	Develop clear policies and/or guidelines for the integration of Traditional Knowledge and Science in decision-making, to aid the creation of a fully representative management system.
▪ Action 1.2.2	Factor ecosystemic variables into polar bear management decisions (e.g., health and abundance of prey, impacts of climate change and anthropogenic activities, etc.).
▪ Action 1.2.3	Recognize the value of Inuit and Cree knowledge and their approaches to wildlife management and integrate those approaches with knowledge gained through scientific research during decision-making.

Approach 1.3	***Revise the harvest registration process with the goal of achieving complete reporting of all human-caused mortality of polar bears.***
▪ Action 1.3.1	Identify common obstacles encountered within the current registration process.
▪ Action 1.3.2	Identify most appropriate organization to administer/oversee harvest registration at the community level.
▪ Action 1.3.3	Establish clear protocol for harvest reporting and ensure all necessary implementation tools are in place.
▪ Action 1.3.4	Develop and implement a communications plan and public outreach tools that ensure familiarity with process and the importance of complete registration of the harvest.
▪ Action 1.3.5	Regularly assess effectiveness of the harvest registration system and identify necessary improvements, including implementation of regulatory mechanisms if voluntary reporting is ineffective.
Approach 1.4	***Implement a harvest management system that provides the tools necessary to achieve agreed-upon management objectives and long-term persistence of polar bear subpopulations; these can include mechanisms such as NQLs and TAT.***
▪ Action 1.4.1	For each subpopulation, review its status, identify management objectives and determine whether the current management system: a) is sufficient to ensure that harvesting is sustainable, in line with the principles of conservation and consistent with the management objectives; and b) does not unduly limit Inuit/Cree harvesting rights.
▪ Action 1.4.2	For subpopulations where the existing management system is deemed to be inadequate to address a conservation concern, or when it unduly restricts harvesting rights: a) amend the current management system as appropriate to address the issue identified; and b) ensure that communities are informed of the options, and allowed an opportunity to provide input; and c) initiate decision-making processes defined under the JBNQA, NILCA and EMRLCA, as necessary and make all attempts to ensure that management decisions are aligned with the processes occurring in neighboring jurisdictions.

Approach 1.5	***Annually review all pertinent information to inform adaptive management of polar bears.***
▪ Action 1.5.1	For each subpopulation, establish a forum where all relevant information can be shared amongst the management partners on a regular basis.
▪ Action 1.5.2	Annually review the information available for each subpopulation (e.g., harvest, abundance, health, DLP kills, etc.) and assess whether the existing management system is effective.
▪ Action 1.5.3	Make necessary changes to the management system (process is defined under Approach 1.4, above).
Approach 1.6	***Ensure, as appropriate, the protection of young bears and females.***
▪ Action 1.6.1	Maintain, using the most appropriate measures, the protection of young bears (e.g., local LNUK bylaw, formal government regulations, etc.).
▪ Action 1.6.2	Document the sex of all harvested polar bears (including bears killed in defense of life and property).
▪ Action 1.6.3	When there is a significant or sustained increase in the proportion of females killed, implement measures to lower the take of female bears (e.g., hunter education, etc.).
▪ Action 1.6.4	If necessary, develop and implement a regulatory framework that ensures sex-selective harvesting.
Approach 1.7	***Explore the implications and social acceptability of implementing a polar bear sport hunt and, as appropriate, identify the means by which such an activity could be established.***
▪ Action 1.7.1	Identify the obstacles, implications and potential benefits of a sport hunt (including experiences from other jurisdictions).
▪ Action 1.7.2	Obtain a clear mandate from Nunavik Inuit about whether to pursue the establishment of a sport hunt, after they have been given an opportunity to weigh all of the information.
▪ Action 1.7.3	If Nunavik Inuit are clearly in support of a sport hunt, undertake the necessary consultative processes with the Crees of Eeyou Istchee prior to developing and implementing a framework under which a sport hunt could be initiated.

Objective #2: Collect Traditional Knowledge and scientific information related to polar bears to inform management decisions.	
Approach 2.1	***Ensure coordination and collaboration towards monitoring the health and abundance of polar bears, at a frequency that allows robust decision-making.***
▪ Action 2.1.1	Maintain a collaborative effort to monitor polar bear health, abundance and trends through regular surveys.
▪ Action 2.1.2	Identify gaps and obstacles encountered in current and previous sampling programs and implement revisions that are practical, agreeable to hunters, and which allow collection of information that complements the data gathered during surveys.
▪ Action 2.1.3	Identify additional opportunities for community-based monitoring that can contribute to knowledge relevant for polar bear management.
▪ Action 2.1.4	Encourage the complementarity of research methods and priorities between regions, in collaboration with partners from other jurisdictions.
Approach 2.2	***Document the Traditional Knowledge of Nunavik Inuit and the Crees of Eeyou Istchee to inform research and guide management efforts.***
▪ Action 2.2.1	Ensure that the holders of Inuit Qaujimajatuqangit/Cree Knowledge are afforded a meaningful opportunity to provide input on polar bear management.
▪ Action 2.2.2	Identify and address the gaps in the extent of documented Inuit Qaujimajatuqangit/Cree Knowledge and in its availability to decision-makers (and re-assess periodically).
Approach 2.3	***Improve our understanding of the changes to polar bear habitat, behaviour and interaction with other species and the potential impacts of these changes on polar bears.***
▪ Action 2.3.1	Assess the availability of ecosystemic information relevant to the management of polar bear (i.e., habitat use, behaviour, prey, competitors, etc.) within the management plan area.
▪ Action 2.3.2	Establish research priorities that seek to address any identified knowledge gaps.

▪ Action 2.3.3	Gather the baseline information needed to better understand the potential impacts of future habitat alteration and increased human activity.
▪ Action 2.3.4	Seek to understand the evolving relationship between polar bears, their prey and the expansion or contraction of the range occupied by other species with which they may interact.
Approach 2.4	***Promote and encourage the training and meaningful involvement of Cree and Inuit in polar bear research and management.***
▪ Action 2.4.1	Encourage the participation of Inuit and Cree in the planning and interpretation of research and monitoring programs.
▪ Action 2.4.2	Build local capacity to undertake and actively participate in polar bear research, including the establishment of community-based monitoring and community-driven research programs.
▪ Action 2.4.3	Provide tools to facilitate the documentation of Inuit and Cree observations related to polar bear.
Approach 2.5	***Work towards improving non-invasive research methods and develop alternative means to collect biological information.***
▪ Action 2.5.1	Provide information to communities about polar bear research methods and best practices, including the pros and cons of invasive methods of research (e.g., what information is lost when researchers cannot handle/collar polar bears).
▪ Action 2.5.2	Obtain the Inuit and Cree positions with regards to the immobilization of polar bears.
▪ Action 2.5.3	Develop a clear protocol that defines the necessary steps and authorizations, whenever invasive research methods cannot be avoided (e.g., identify an appropriate consultation process).
▪ Action 2.5.4	Identify means of obtaining the necessary biological information that are non-invasive, or less invasive.

Objective #3: Establishing strategies to minimize the effects of human activities on polar bears and their habitat, as well as to reduce human-bear conflicts.	
Approach 3.1	***Document all instances of human-bear conflicts.***
▪ Action 3.1.1	Put in place and maintain a standardized system to track all instances of polar bear – human conflict; regardless of whether a DLP kill occurs or not.
▪ Action 3.1.2	Ensure that Inuit and Cree communities are informed about this system and that there is local capacity to document this information.
▪ Action 3.1.3	Ensure that the information about polar bear – human interactions is flowing to decision-makers such that the information is considered when management measures are developed.
Approach 3.2	***Develop programs and tools aimed towards reducing human-bear conflicts within the management plan area to increase public safety while reducing the number of Defense of Life and Property kills.***
▪ Action 3.2.1	Where relevant, establish community polar bear response plans and support their implementation.
▪ Action 3.2.2	Put in place programs and tools to assist Cree/Inuit in dealing with dangerous bears (e.g., support polar bear patrols in high-risk areas, make polar bear deterrents available, etc.).
▪ Action 3.2.3	Increase public awareness about the danger of polar bears and share best practices on how to prevent interactions and/or deal with dangerous bears.
Approach 3.3	***Clarify the rights and obligations of Inuit, Cree and non-beneficiaries in respect to defense of life and property kills and provide clear guidance on the steps that must be followed when such circumstances arise.***
▪ Action 3.3.1	Develop a practical protocol for dealing with DLP kills in the management plan area, which reflects provisions of the NILCA and EMRLCA related to emergency kills and is consistent with the JBNQA.
▪ Action 3.3.2	Implement this protocol and ensure that it is effectively communicated throughout the region.
▪ Action 3.3.3	Ensure that Inuit, Cree and non-beneficiaries in the region are aware of their rights and obligations concerning DLP kills, and of other means to deal with problem bears.

Approach 3.4	***Promote the respect and ethical treatment of polar bears by all users.***
▪ Action 3.4.1	Reaffirm the engagement of all -management partners not to send polar bear cubs from the management area into zoos and aquariums.
▪ Action 3.4.2	Promote Inuit and Cree traditional values regarding polar bears to visitors and to local communities.
Approach 3.5	***Minimize the impacts of industrial development, shipping, tourism and other human activities on polar bears in the management area.***
▪ Action 3.5.1	Identify sensitive polar bear habitats for which protection and stewardship measures may be needed and ensure that this information is available to land use planners and during impact review processes.
▪ Action 3.5.2	Establish industry guidelines and best practices aimed at minimizing the detrimental effects caused by human activities.

1899

Objective #4: Collaborate, coordinate, communicate and promote the exchange of knowledge and information related to polar bears.	
Approach 4.1	***Foster the transmission of traditional knowledge between elders and youth.***
▪ Action 4.1.1	Develop approaches, such that the knowledge of elders related to polar bears is available to the benefit of future generations of Inuit and Crees (including knowledge about preparation and use of polar bear products).
▪ Action 4.1.2	Collaborate with the appropriate institutions towards developing educational materials that foster this exchange.
Approach 4.2	***Strengthen the two-directional flow of information between community members, researchers, management authorities and other relevant stakeholders.***
▪ Action 4.2.1	Promote the exchange of information between community members, researchers, management authorities and other relevant stakeholders (including with regards to rights and responsibilities) and ensure that these exchanges inform the National/International stage.

▪ Action 4.2.2	Encourage Crees/Inuit representation in scientific meetings.
▪ Action 4.2.3	Encourage researchers to visit Cree/Inuit communities, or to utilize local/regional events and communications tools (e.g., community radio) to inform Inuit and Crees about their research and findings.
▪ Action 4.2.4	Promote (to the scientific community, management authorities and relevant stakeholders) the value and importance of working collaboratively with Inuit and Crees on matters related to polar bear.
Approach 4.3	***Create a permanent forum wherein information and best practices related to polar bears can be discussed, and which will facilitate the coordination of polar bear management by the relevant parties.***
▪ Action 4.3.1	Formalize the Québec – Eeyou Marine Region – Nunavik Marine Region Polar Bear Working Group into a permanent committee and maintain its functionality.
▪ Action 4.3.2	Task the Working Group with development of an Implementation Plan that will give effect to the Actions proposed herein, and with the monitoring of its execution.
Approach 4.4	***Enhance collaboration with other jurisdictions to guide polar bear management on a national and international level.***
▪ Action 4.4.1	Recognizing extent of each jurisdiction's authority, maintain dialogue towards ensuring a coordinated polar bear management effort across jurisdictional boundaries.
▪ Action 4.4.2	Evaluate the effectiveness of current means for inter-jurisdictional coordination of polar bear management and, as appropriate, consider implementing structures to facilitate this exchange.
▪ Action 4.4.3	Ensure that management partners participate in provincial, national and international forums (e.g., PBAC, PBTC, Polar Bear Range States, CITES, etc.).

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