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Polar bears in Ontario

Ontario is home to the southern-most population of polar bears in the world. Climate change is considered the greatest threat to the long-term survival of these bears. The Ontario Ministry of Natural Resources and its partners are working together to help ensure the long-term survival of Ontario's polar bears.

This report provides information about the current status of Ontario's polar bears, factors affecting them, and actions the Ontario government is taking to help maintain the health of polar bears in the long-term.

Ecology of polar bears

Polar bears are among the largest bears in the world. Adult males may reach 800 kilograms (kg) or 1760 pounds (lbs). In Ontario, the largest male bear recorded from "live capture" research studies weighed 654 kg (1439 lbs). The average weight of male polar bears in Ontario is about 500 kg (1100 lbs). Adult female bears are smaller and average around 300 kg (660 lbs); their peak weights do not usually exceed 400 kg (880 lbs).

Polar bears are the most predatory of all bears. They spend most of the year hunting seals on sea ice. Ringed seals are their primary prey. Bearded seals are also an important food source. It was once believed that polar



Figure 1. Male polar bear. Photo by L.R. Walton.

The polar bear (*Ursus maritimus*) is Ontario's largest carnivore (Figure 1) and is an important component of the Hudson and James Bay ecosystem of northern Ontario, northern Quebec and southern Nunavut. It's also of significant cultural importance to Aboriginal communities. The continued presence of polar bears is a strong indicator of the health of this northern ecosystem.

There are currently about 25,000 polar bears world-wide. Approximately 15,000 of these bears live in 13 sub-populations in Canada's northern areas. Polar bears in Ontario are primarily from the Southern Hudson Bay sub-population, which includes polar bears in James Bay (Figure 2). This subpopulation is the most southerly breeding population of polar bears in the world.

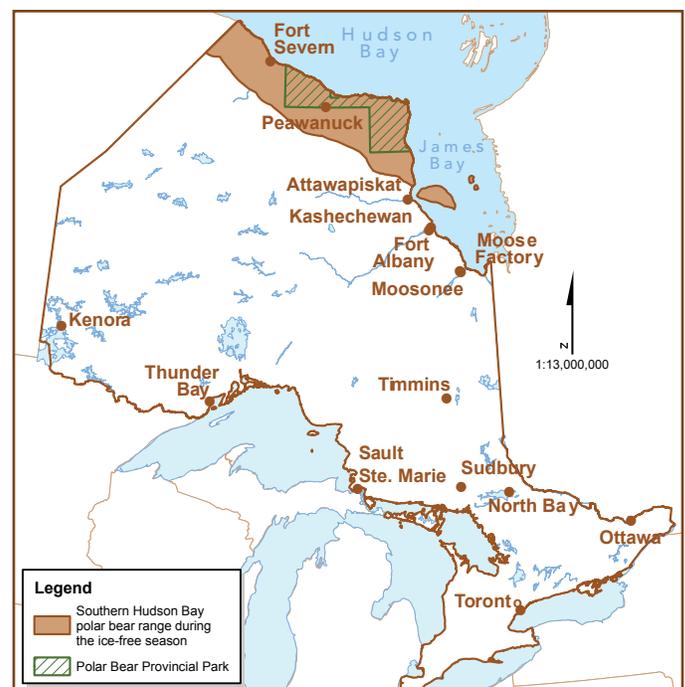


Figure 2. Distribution of Southern Hudson Bay polar bears during the ice-free season.

bears wandered throughout the Arctic and were carried around on moving sea ice. However, radio-telemetry (a technique where collars with a transmitting device are placed around a bear's neck to allow researchers to locate and track the bear's movements), and genetic techniques have shown polar bears often use the same areas each year.

Polar bears move greater distances and use larger areas (Figure 3) than other land mammals. Each year, they travel thousands of kilometres and use areas up to 300,000 square kilometres in size (an area about half the size of Saskatchewan or 42 times larger than the Greater Toronto Area).

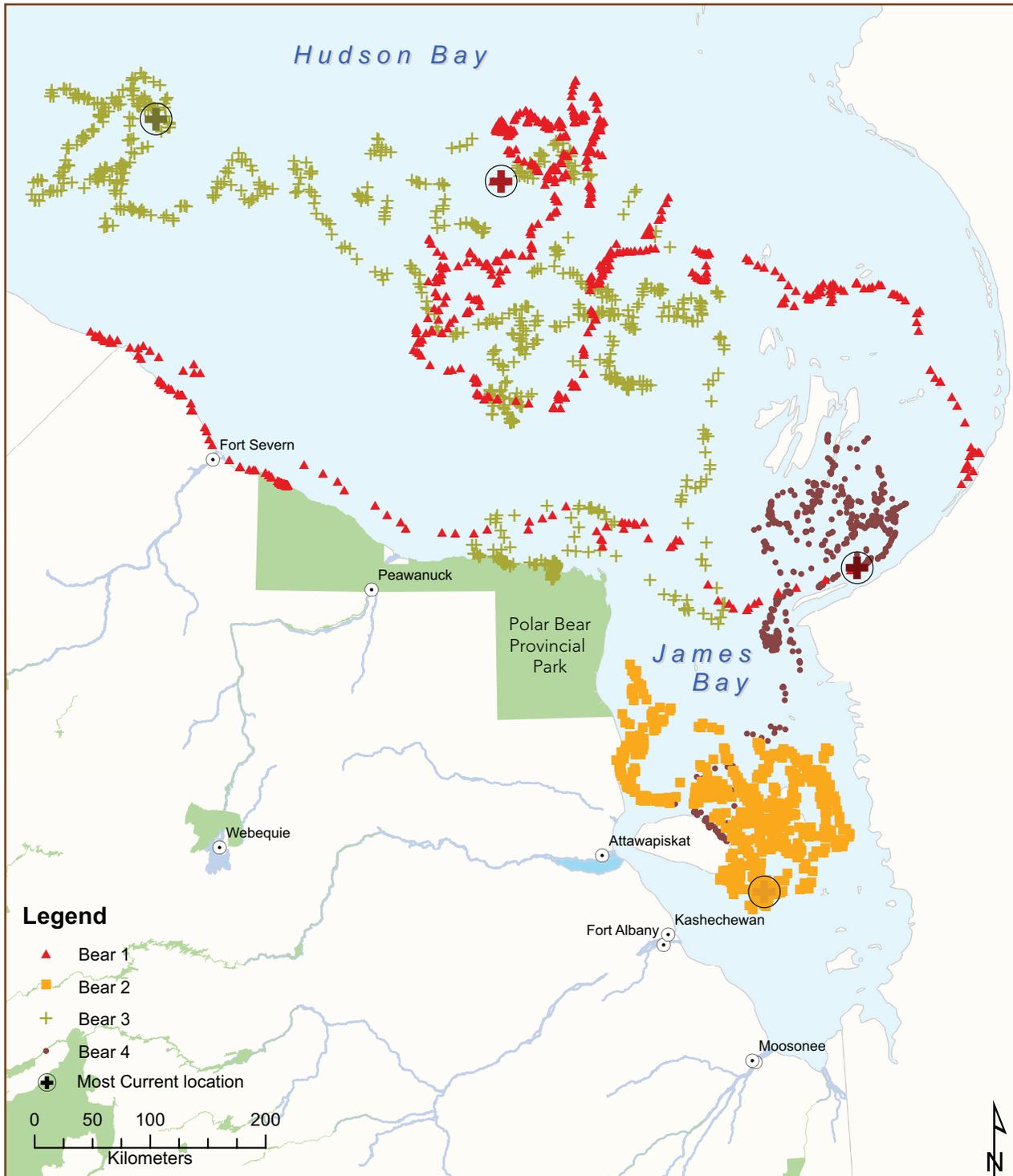


Figure 3. Movements of four female polar bears, as monitored by radio-telemetry from September 2007 until June 2008. Note the long distances travelled.

Annual life cycle

The sea ice in Hudson Bay usually melts by mid-July and doesn't begin reforming until November. During the four to five month ice-free season, polar bears from the Southern Hudson Bay subpopulation are forced onto land primarily in Ontario or onto islands within James Bay in Nunavut. During this time, bears do not actively forage for food, but only eat as the opportunity occurs. Cubs lose an average of 0.2 kg (0.5 lbs) per day and subadults (independent bears that have not yet reached reproductive age) and adult males lose an average of 0.9 kg (2.0 lbs) per day. When the sea ice reforms most bears return to hunt for seals. They remain on the ice until it melts again the following summer.

Pregnant bears are the only exception to this annual pattern (Figure 4). These females are forced onto shore at the same time as other bears. In Ontario they move up to 120 km inland to find denning areas. They leave their denning areas between mid-February and mid-March. Data from satellite-collared bears and from summer airplane or helicopter surveys in Ontario indicate bears select treed areas, river banks, gravel ridges, and palsas (peat mounds that are raised due to the action of frost heaving) to construct their maternity dens (Figures 5 and 6).



Figure 5. Female polar bear den in a treed area in northern Ontario. Photo by D. Sutherland.



Figure 6. Female polar bear den on the edge of a peat palsa in northern Ontario. Photo by D. Sutherland.

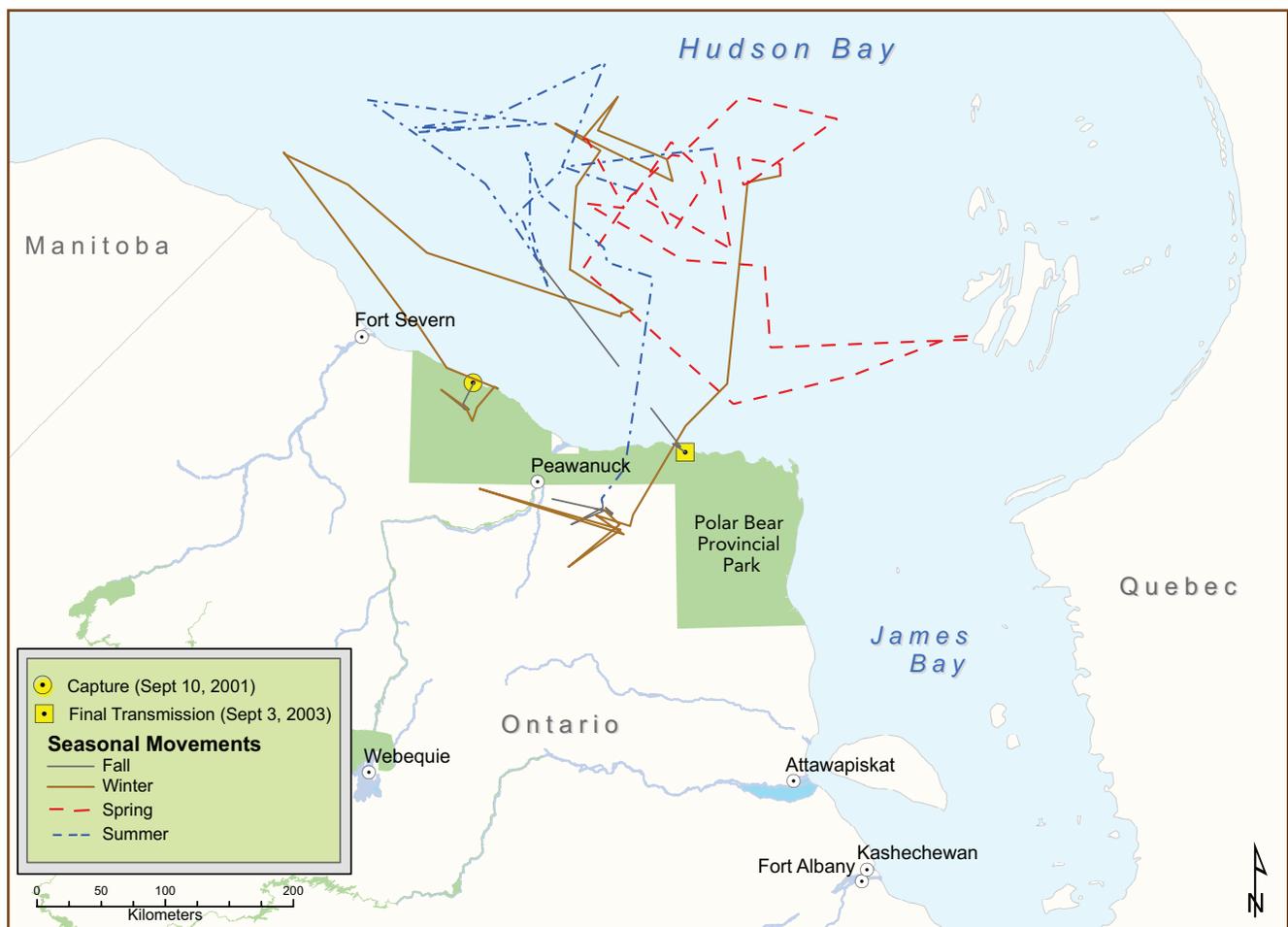


Figure 4. Seasonal movements of a single adult female polar bear, September 2001 to September 2003.

Polar bears mate while on the sea ice in April or May, and cubs are born between late December and early January. Cubs are blind and weigh less than 1 kg (2 lbs) at birth. They first leave the den between mid-February and mid-March. The mother leads them out onto the sea ice and begins hunting for seals again. Pregnant bears survive their seven to eight month off-ice period by using stored body fat; they may lose more than 40 per cent of their body mass during this time. Most cubs are nursed until they are two years old; some are weaned after their first year. They are dependent on their mothers for their first two years. During this time they learn survival skills and hunting techniques. Polar bears have a low reproductive potential. Female polar bears don't begin reproducing until they are five or six years old. Once they become reproductively active they typically have litters of one to two cubs (litters of three cubs are rare) every three years. Polar bears can live up to 25 years, but there is evidence their ability to reproduce declines after age 20.

The state of polar bears

Historical condition

During the 1950s and 1960s, the harvest of polar bears rapidly increased throughout the circumpolar Arctic. In response, the five nations where polar bears occur (Canada, Denmark (for Greenland), Norway, United States, and the former Soviet Union) signed the International Agreement on the Conservation of Polar Bears and their Habitat in 1973 (<http://pbsg.npolar.no>). As a signatory to this agreement, Canada pledged to protect polar bear habitat, and manage polar bear populations based on the best available scientific data.

Since the International Agreement was signed, many polar bear populations recovered to former levels as harvests were controlled and closely monitored.

Current condition

The Southern Hudson Bay subpopulation of polar bears is currently estimated to contain between 900 and 1,000 bears. The size of this subpopulation has not changed since the mid-1980s. However, the body condition of these bears has declined. Body condition (defined as the combined mass of fat and skeletal muscle relative to body size) is a measure that's believed to be a good predictor of polar bear health (Figure 7). Bears from this sub-population are also starting to show trends of declining survival rates. These declines are believed to be due to climate change which results in a shorter period of ice cover in winter. (For more information see the following climate change section).

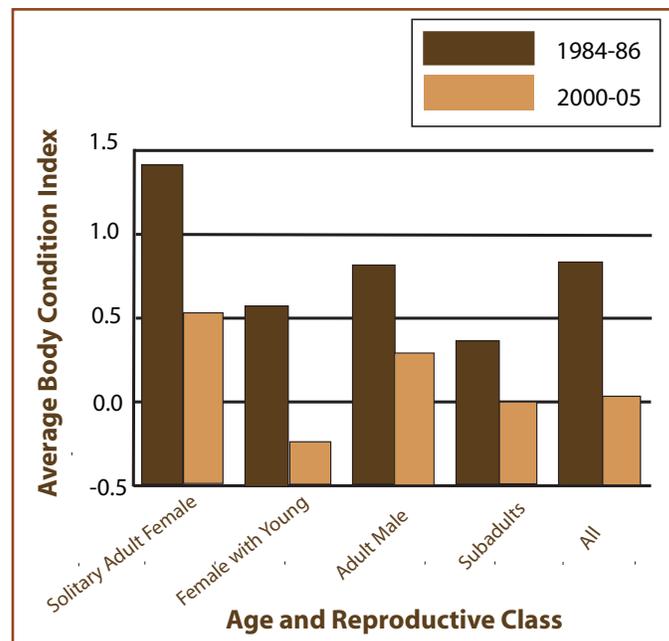


Figure 7. Average Body Condition Index values for Southern Hudson Bay polar bears captured in Ontario between 1984-86 and 2000-05 (Obbard et al 2006).

Factors potentially affecting polar bears in Ontario

Climate change is likely the greatest long-term threat to polar bears. Over-harvesting, environmental contaminants and increasing industrial development in Ontario's far north are factors that may also affect the long-term survival of polar bears in the province.

Climate change

In Hudson Bay and James Bay, climate change is causing sea ice to break-up (thaw) earlier and freeze-up later. It's believed this reduces the amount of time polar bears can spend on the ice feeding on seals to put on fat to support their seasonal fast. Over the last 30 years, the break-up of sea ice has occurred about 9.5 days earlier per decade in northern James Bay and between five and eight days earlier per decade along the southern Hudson Bay coast of Ontario.

The Southern Hudson Bay subpopulation of polar bears is showing declines in body condition and trends towards lower survival rates, although the number of bears has remained stable. If these trends continue in southern Hudson Bay, they may lead to a decline in the size of the subpopulation. Such declines have been observed elsewhere. For example, the Western Hudson Bay subpopulation of polar bears has shown declines in body condition, reproductive

success, survival (in young and old bears near Churchill, Manitoba and in years with early sea ice melt) and the number of bears (a 22 per cent reduction) over the past 20 years.

Harvest

Because of their low reproductive potential, polar bear populations are especially vulnerable to the over-harvesting of adult females. Aboriginal communities in Ontario, Nunavut, and Quebec all hunt polar bears from the Southern Hudson Bay subpopulation. Sustainably harvesting this subpopulation depends on continued cooperative monitoring and managing of harvest activities among all three jurisdictions. For information on current harvest levels and management in Ontario, refer to the Harvest Management section of this report.

Environmental contaminants

Polar bears are a top carnivore and environmental contaminants accumulate in their bodies. Contaminants such as PCBs (polychlorinated biphenyls) and various pesticides like DDT (dichlorodiphenyltrichloroethane) enter their bodies through the food they eat. These contaminants are produced by people in populated areas and are transported to remote northern and arctic regions by wind and water currents. If contaminant levels rise or new contaminants are introduced polar bear mortality may increase. This might also affect their ability to reproduce.

Industrial development

Development in Ontario's Far North has increased in recent years. For example, a diamond mine was recently established, a new electricity transmission corridor was built along the James Bay coast, and winter roads were built linking Shammatawa (Manitoba) to Fort Severn and Peawanuck (Ontario). More developments, such as wind power, additional electrical transportation corridors, all-weather roads, and accelerated mining exploration are being proposed. With increased development, more frequent bear-human encounters (and associated bear mortalities), increased harvest, and loss of polar bear habitat are growing concerns.

Polar bear management

Habitat protection

The government of Ontario established Polar Bear Provincial Park along the southern Hudson Bay coast in 1970 (Figures 2 and 8). This large wilderness-class park (about 2.4 million hectares) plays a significant role in protecting Ontario's polar bear habitat. A high proportion of Ontario's bears use this park during the ice-free season and about one-third of all maternity dens in Ontario are found in the park.



Figure 8. Aerial view of Polar Bear Provincial Park. Photo by L.R. Walton.

In addition to Polar Bear Provincial Park, the government of Ontario has committed to work with First Nation and northern communities, natural resource industries, and scientists to map and permanently protect an interconnected network of conservation lands across Ontario's Far North. A broad framework for this plan will be completed in 2009 and protection of more than 225,000 square kilometres of the northern boreal region will be completed in the next 10 to 15 years.

Harvest management

The governments of Ontario, Nunavut, and Quebec and their respective Aboriginal communities are responsible for the sustainable management of the Southern Hudson Bay subpopulation of polar bears. In Nunavut, the territorial government has a co-management agreement with the Sanikiluaq hunter and trapper organization to monitor and manage the harvest of bears from this subpopulation. In Quebec, Aboriginal communities harvest polar bears for subsistence under the James Bay agreement. They participate in the cooperative monitoring and management of polar bear harvests, keeping harvests at levels that respect the terms of the agreement.

In Ontario, only First Nation hunters who are Treaty 9 members residing along the Hudson Bay and James Bay coast can legally harvest polar bears. Ontario reached an informal agreement on polar bear harvest quotas in 1976 with the Aboriginal communities of Fort Severn, Winisk (now Peawanuck), Attawapiskat, Fort Albany and Kashechewan. Research and monitoring conducted since reaching this informal agreement has revealed that bears from this subpopulation are also harvested in Nunavut and Quebec. If these informal quotas (30 bears per year in Ontario) were ever reached, they would likely be considered too high, in conjunction with harvests in Nunavut and Quebec, for the long-term sustainability of this subpopulation. However, annual minimum harvest levels in Ontario are well below the informal quotas. Since the 1990s, an average of eight bears per year have been harvested. This is less than half the number that were harvested annually in the 1970s and 1980s. Further, Ontario, Nunavut, and Quebec continue to share the latest information and science to sustainably manage this shared sub-population of polar bears.

Status designation

The Ontario Ministry of Natural Resources lists polar bears as a species of “special concern” provincially under the *Endangered Species Act*. They are also listed as a species of “special concern” nationally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). This status designation means polar bears are recognized as having characteristics that make them particularly sensitive to human activities (such as climate change) or natural events that may cause them to become threatened or endangered.

The status of polar bear populations in Canada was reassessed in May 2008. The updated COSEWIC status report incorporates more community and Aboriginal Traditional Knowledge about polar bears. Elsewhere, in May 2008, the United States Fish and Wildlife Service listed polar bears as “threatened” under the *United States Endangered Species Act*. Globally, the International Union for the Conservation of Nature (IUCN) listed the polar bear as “vulnerable” in the IUCN Red List of Threatened Species.

Research

The Ministry of Natural Resources and external partners have been proactive and innovative in continuing research to:

- better define the distribution and movements of polar bears of the Southern Hudson Bay subpopulation through radio-telemetry and genetic techniques;

- estimate and monitor polar bear numbers through live-capture techniques;
- assess the health of the bears by taking body measurements of live-captured bears and testing body tissues for contaminants;
- determine and describe important polar bear habitat, including denning and breeding areas, through airplane and helicopter surveys and radiotelemetry techniques; and
- determine the significance of protected areas (Polar Bear Provincial Park) to the conservation of polar bears through airplane and helicopter surveys and radio-telemetry techniques.

Outlook for the resource

The subpopulation of polar bears that occurs in Ontario appears to be stable at current harvest levels. If climate change continues, further declines in polar bear condition and survival are expected, which may lead to a decline in polar bear numbers. Maintaining a flexible and adaptable harvest management agreement among the governments of Ontario, Quebec, and Nunavut and their respective Aboriginal communities is important to the long-term survival of this subpopulation.

Aboriginal participation

This report is also available in Cree. The report is intended to help build a shared understanding with Aboriginal communities that harvest polar bears in Ontario. The government of Ontario recognizes the importance of Aboriginal traditional knowledge in planning and the management of polar bears. The government will work in partnership with Aboriginal communities to ensure that Aboriginal and western knowledge are considered together in future management actions.

What the public can do to help

Climate change, environmental contaminants, increased industrial development, and harvest are significant factors affecting Ontario’s polar bears. You can help by reducing emissions that contribute to climate change and by supporting sustainable development in Ontario’s far north. To find out what you can do about climate change, visit the GoGreen Ontario website: www.gogreenontario.ca/.

Information sources

The information in this document is based on data collected by the Ministry of Natural Resources' polar bear program and on information from scientific reports.

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Stirling, I. and A. E. Derocher. 1993. Possible impacts of climatic warming on Polar bears. *Arctic* 46: 240-245.

Stirling, I., N. J. Lunn, J. Iacozza, C. Elliott and M. Obbard. 2004. Polar bears distribution and abundance on southwestern Hudson Bay coast during open water season, in relation to population trends and annual ice patterns. *Arctic* 57:15-26.

Related information

- COSEWIC polar bear status report 2002 (www.sararegistry.gc.ca/virtual_sara/files/cosewic/sr_polar_bear_e.pdf)
- Species at Risk in Ontario (SARO) List (www.mnr.gov.on.ca/STEL02_163859.pdf)
- Ontario's Endangered Species Act 2007 (www.mnr.gov.on.ca/en/Business/Species/2ColumnSubPage/STEL01_131232.html)
- IUCN Red List of Threatened Species (www.iucnredlist.org/details/22823)
- Hinterland Who's Who "fact sheet" on polar bears (www.hww.ca/hww2.asp?id=99)
- WorldWildlife Fund Canada information on polar bears (www.panda.org/about_wwf/what_we_do/species/publications/index.cfm?uNewsID=121280) and (polarbears.wwf.ca/home.html)
- Polar Bear Specialist Group (pbsg.npolar.no/)

For more information

For more information on the status of polar bears in Ontario, please contact:

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