



WILDLIFE AND GLOBAL WARMING

# Navigating the Arctic Meltdown



## POLAR BEARS

Conflict, starvation and cannibalism. These bleak words evocative of an adventure tale set in the steamy tropics actually describe polar bears facing the loss of their sea-ice feeding grounds, perhaps by as early as 2040, as the Arctic climate rapidly warms. “During 24 years of research on polar bears in the southern Beaufort Sea region of northern Alaska and 34 years in northwestern Canada, we have not seen other incidents of polar bears stalking, killing and eating other polar bears,” says scientist Steven Amstrup of the U.S. Geological Survey’s Alaska Science Center.

Signs of trouble in the polar bear’s normally frigid home are numerous, varied and compelling. Survival rates for first-year polar bear cubs fell from 0.61 cubs between 1967 and 1989 to only 0.25 cubs per adult female between 1990 and 2006. First-year cubs and adult male polar bears are getting smaller, apparently from food shortages. Smaller, weaker cubs have a tough time surviving harsh arctic conditions.

Recent populations have fallen by hundreds of bears, especially in the Beaufort Sea and western Hudson Bay regions. In autumn 2004, observers encountered four polar bears that drowned trying to swim between shore and the increasingly distant pack ice. Later that same year, three polar bears were seen hunting, killing and then eating other

bears. In spring 2006, adult female bears and one cub were found dead, their fat stores depleted from starvation. At Carnivores 2006, an international conference hosted by Defenders of Wildlife, Canadian Wildlife Service polar bear specialist N. J. Lunn linked this reduced polar bear survival to summer ice-breakups that now occur up to three weeks earlier in the season.

What does all this mean for the bear? Deborah Williams of Alaska Conservation Solutions, a nonprofit conservation group, called these recent unprecedented findings the “bloody fingerprints” of global warming. “This is not a Coca-Cola commercial,” she says. “This represents the brutal downside of global warming.”

## ARCTIC ICON AT RISK

Polar bears are among the largest carnivores in the world, rivaled only by the Kodiak brown bears of southern Alaska. As its scientific name, *Ursus maritimus*, suggests, the polar bear is primarily a marine bear. Highly dependent on pack ice in the arctic region, polar bears spend much of their time hundreds of miles from land. Numerous adaptations uniquely suit them to life in icy habitats. Their fur is thicker than any other bears' and covers even their feet, for warmth and traction on ice. The long neck and narrow skull of the polar bear probably aid in streamlining the animal in the

## “THIS IS NOT A COCA-COLA COMMERCIAL. THIS REPRESENTS THE BRUTAL DOWNSIDE OF GLOBAL WARMING.”

water, and the front feet are large, flat and oarlike. A thick layer of blubber provides buoyancy and insulation.

Polar bears travel great distances in search of prey, which consists mainly of ringed seals and bearded seals. The most important habitats for polar bears are the edges of pack ice, where currents and wind interact with the ice, forming a continually melting and refreezing matrix of ice patches. These are the areas of greatest seal abundance and accessibility. Individual bears can travel thousands of miles per year following the seasonal advance and retreat of sea ice. In one study, a single radio-collared animal ranged over an area encompassing most of the north coast of Alaska—nearly 200,000 square miles. Polar bears can also swim as far as 40 miles.

### Geographic Distribution of Polar Bears



Polar bears are found exclusively in the Arctic in the hatched areas on the map above. Alaska, Canada, Greenland, Norway and Russia have polar bear populations.

In addition to seals, polar bears eat walrus, seabirds, carrion, some berries and vegetation, and in areas near human habitation, garbage. Polar bear teeth and claws are more specialized for eating meat than those of the brown bear, whose diet includes more berries and seeds.

Polar bears are generally solitary as adults, except during the mating season from March to June. Pregnant females hibernate in dens on land or on thick, stable pack ice. Cubs are born in the den from November to January. Litter size ranges from one to four, most commonly two. At birth, cubs weigh about a pound and are completely helpless.

They gain weight rapidly and generally weigh 20 to 30 pounds when they emerge from the den with their

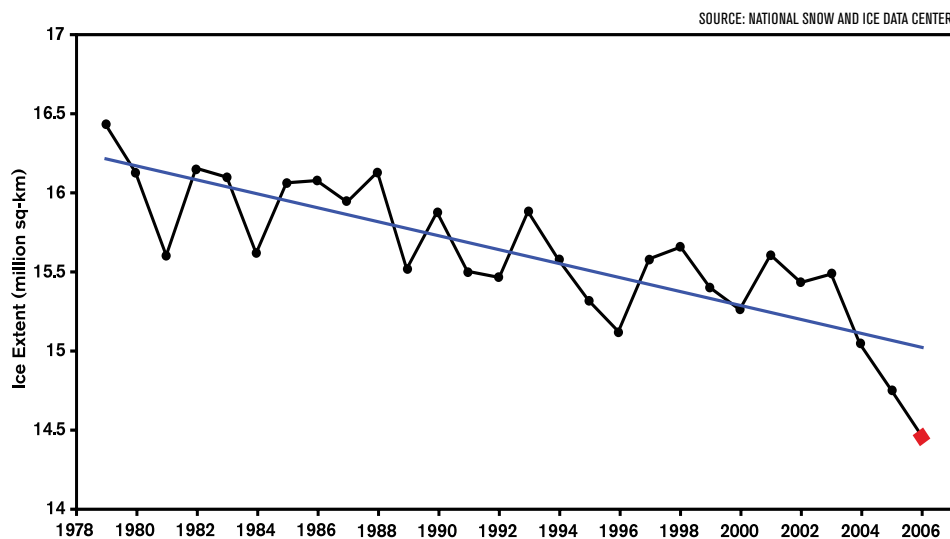
mothers in March or April. Females with cubs are often found farther from the edges of the pack ice, where seal dens are frequently located and there is less competition from adult male bears. Cubs leave their mothers at about two years and can live 20 to 25 years.

Unlike many bear species, males and non-pregnant females generally do not hibernate for extended periods in the winter. Conversely, many bears in the southern parts of the range reduce their level of activity in the summer when lack of ice makes seal hunting difficult.

The World Conservation Union (IUCN) estimates that there are between 20,000 and 25,000 polar bears in the world, distributed throughout the Arctic region in 19 subpopulations of 100 to 3,000 bears each. Many of these populations are difficult to track accurately, but the trends in well-studied populations are alarming. In the western Hudson Bay, numbers have declined from 1,200 bears in 1987 to 935 bears in 2004. And in the Beaufort Sea north of Alaska, the population dropped 15 percent in five years, from 1,800 to 1,526 bears. Only the populations of the islands of Canada's Nunavut territory are stable or increasing. In May 2006, the IUCN added the polar bear to its Red List of the world's most imperiled animals, predicting a 30 percent reduction in the polar bear population in the next 45 years.

Several factors are contributing to the decline of polar bears. Prevailing winds and water currents deposit residues of PCBs, pesticides and other persistent toxins in the Arctic region. Pollutants are stored in the animals' fat and accumulate, so top predators such as polar bears receive doses sufficient to interfere with reproduction, growth and development, and immune function. Tourism can also lead to bear kills, particularly where poor handling of food and garbage invites habituation. Oil exploration in prime polar bear habitats could cause pregnant females to avoid potential den sites, and spills pose a danger to bears and their prey. The most serious emerging threat to polar bears, however, is climate change.

## Mean Winter Maximum Extent of Arctic Sea-Ice Pack (1978-2006)



### WARMING TRENDS

Loss of the Arctic snow pack and the thinning, disappearance and offshore movement of the sea-ice pack all reduce essential polar bear habitats (see graph above). To survive, polar bears depend entirely on sea ice as a platform for hunting the marine mammals that provide their nutritional needs. Although they are excellent swimmers, polar bears are not adept at catching seals in the water.

For breeding, female bears require soft, deep snow for denning on land to give birth and then insulate the more vulnerable cubs. The seals that polar bears hunt on the pack ice also require enough snow to shelter their own pups from the severe Arctic elements. Changing ice conditions have forced seals to move and give birth to their pups in different locations—even under ice—making finding and catching seals a bigger challenge for the bears.

As this delicate system breaks down, the polar bears' problems multiply. Some polar bears simply leave the pack ice and try to survive on land instead. This creates other vulnerabilities. For example, according to Canadian biologist Lunn, polar bears make little use of terrestrial food so they must rely on fat reserves built up during the previous spring. Yet the shorter late-autumn to late-spring pack-ice season means less and less time to acquire the reserves needed to get through the lean summer season. In Russia and elsewhere, where polar bears move to land to seek out scarce food, conflicts with people and reports of polar bears feeding on geese, gulls and other wildlife not historically part of their diet are increasing. Compounding the polar bears' plight, recent increases in on-land sightings in Nunavut were misinterpreted as population increases, resulting in higher hunting quotas.

"Without stabilizing the climate by taking serious and urgent action on climate change, I don't see a future for polar bears at all," says Andrew Derocher, head of the Polar Bear Specialist Group for IUCN.

### PREPARING FOR THE MELTDOWN

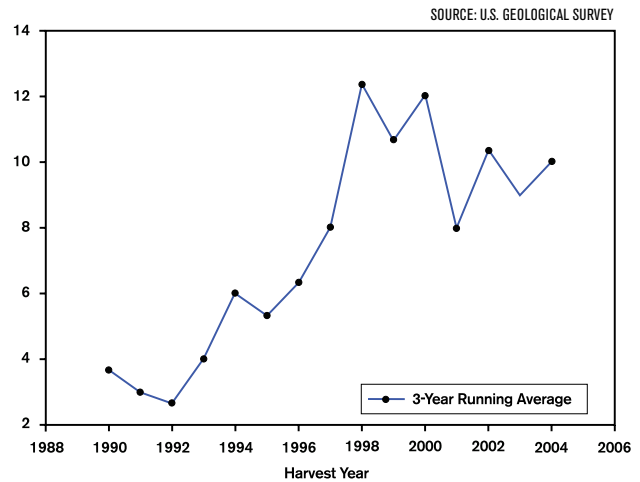
The polar bear's habitat is melting away, threatening its survival, but we can still save this Arctic icon. By taking immediate steps to reduce greenhouse gas emissions, we can address the root cause of global warming. And by embracing the following conservation measures, we can help the polar bear adapt to, and navigate through, the looming bottleneck of complex threats posed by climate change.

- **Closely monitor polar bear hunting programs and limit the number of licenses issued and reduce or eliminate annual quotas as necessary.** Norway has already banned all polar bear hunting. A bilateral agreement between the United States and Canada allows an annual harvest of 80 bears by a combination of subsistence hunters and sport trophy hunters. In Greenland, where polar bear hunting was poorly regulated in the past, the government began implementing and enforcing quotas in 2006.
- **Increase national and international legal protections for polar bears.** A Defenders' study revealed a consistent trade in polar bear parts and increasing trade of claws and skin pieces. Uplisting the polar bear from CITES Appendix II to Appendix I at the next Conference of the Parties in June 2007 would reduce trade to a level that would not jeopardize the survival of the species. In Canada, the bear should be listed on Schedule 1 of Canada's Species at Risk Act. In the United States, the polar bear should be listed as threatened under the Endangered Species Act.
- **Enforce all existing laws regulating the take, transport or sale of polar bears and polar bear parts.** Current laws reduce market demand overall and consequently limit incentives to overhunt. Special attention should be given to Internet sales of wildlife parts, an outlet that provides an opportunity for the illegal trade in polar bears to continue by reaching people who would otherwise not have easy access to vendors.

- **Implement local and regional bear-awareness campaigns to help minimize conflicts between people and polar bears.** Bear-human interactions are already increasing in coastal villages. Consequently, so is the number of bears taken in defense of life and property (see graph, right). By educating people about bear behavior, the need to resort to lethal control of problem polar bears can be minimized. Such bear-awareness programs have been quite successful in many areas with other bear species.

- **Urge Congress to pass legislation to implement the “Agreement on the Conservation and Management of the Alaska-Chukotka Polar Bear Population.”** This treaty, signed by the United States and the Russian Federation in October 2000, would provide better estimates and timely updates on the status of polar bear populations in the Bering/Chukchi Seas. It would also require the two countries to “take steps necessary to prevent loss or degradation of [polar bear] habitats.” As climate change becomes more pronounced in the Arctic, retreat of sea ice and thus the area to which the current agreement applies will shrink, thus requiring appropriate modification by the Senate to reflect this northward shift.

### Alaskan Polar Bears Taken in Defense of Life and Property (1988-2006)



As sea ice melts and more and more polar bears move inland in search of food, conflicts with humans inevitably occur and lethal control of problem bears increases.

## REFERENCES

Aars, Jon, Nicholas J. Lunn and Andrew E. Derocher (eds). *Polar Bears: Proceedings of the 14<sup>th</sup> Working Meeting of the IUCN/SSC Polar Bear Specialist Group, 20-24 June 2005, Seattle, Washington, USA*. IUCN, Gland, Switzerland and Cambridge, UK, 2006. Available from [http://pbsg.npolar.no/docs/Proc\\_Seattle05.pdf](http://pbsg.npolar.no/docs/Proc_Seattle05.pdf). Internet; accessed 18 December 2006.

Amstrup, Steven. “The Polar Bear-*Ursus maritimus*: Biology, Management and Conservation.” Available from <http://www.polarbearsinternational.org/polar-bears-in-depth/introduction/>. Internet; accessed 30 November 2006.

Amstrup, Steven, Gerald W. Garner and George M. Durner. “Polar Bears in Alaska.” Available from <http://biology.usgs.gov/s+t/noframe/s034.htm>. Internet; accessed 30 November 2006.

Hansen, Lara. “Conservation in the Face of Climate Change,” [Abstract] in *Carnivores Conference 2006: Habitats, Challenges and Opportunities*. November 12-15, 2006, St. Petersburg, FL, p. 2.

Holland, Marika M, Cecilia M. Bitz and Bruno Tremblay. “Future Abrupt Reductions in Summer Arctic Sea Ice.” *Geophysical Research Letters* 33 (2006): L23503.

IUCN Polar Bear Specialist Group Website. Available from <http://pbsg.npolar.no/>. Internet; accessed 30 November 2006.

IUCN 2006. *2006 IUCN Red List of Threatened Species*. Available from [www.iucnredlist.org](http://www.iucnredlist.org). Internet; accessed 01 December 2006.

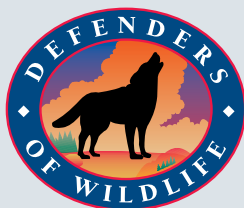
Lunn, Nick. J. “Long-term Trends in Polar Bear Biology in Relation to Climate Change,” [Abstract] in *Carnivores 2006: Habitats, Challenges and Opportunities*, November 12-15, 2006, St. Petersburg, FL, p. 5.

Regehr, Eric V., Steven C. Amstrup and Ian Stirling. *Polar Bear Population Status in the Southern Beaufort Sea*. U.S. Geological Survey Open-File Report 2006-1337, 20 pp.

Stirling, Ian. “Polar Bears and Oil: Ecologic Perspectives,” in *Sea Mammals and Oil: Confronting the Risks*. San Diego: Academic Press, Inc., 1990. Pp. 223-234.

Stirling, Ian and Claire L. Parkinson. “Possible Effects of Climate Warming on Selected Populations of Polar Bears (*Ursus maritimus*) in the Canadian Arctic.” *Arctic* 59 no.3 (2006). Pp. 261-275.

United States-Russia Polar Bear Conservation and Management Act of 2005, S. 2013, 109th Congress.



DEFENDERS OF WILDLIFE

1130 17th Street, NW | Washington, D.C. 20036 | (202) 682-9400

[www.defenders.org](http://www.defenders.org)