

Topical Review

Polar Bears: The Fate of an Icon

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population decline
telemetry
natural history^aVCA Alameda East Veterinary Hospital, Denver, CO, USA^bBoard of Directors, Denver Zoo, Denver, CO, USA

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Polar bears are one of the most iconic animals on our planet. Worldwide, even people who would never see one are drawn to these charismatic arctic ice hunters. They are the world's largest terrestrial carnivore, and despite being born on land, they spend most of their lives out on the sea ice and are considered a marine mammal. Current global studies estimate there are around 20,000 animals in some 19 discrete circumpolar populations. Aside from pregnant females denning in the winter months to give birth, the white bears do not hibernate. They spend their winters on the sea ice hunting seals, an activity they are spectacularly adapted for. Research on these animals is incredibly difficult because of the inhospitable surroundings they inhabit and how inaccessible they make the bears. For many years, the sum of our understanding of the natural history of polar bears came from tracks, scats, the remains of their kills, abandoned dens, and anecdotal observations of native hunters, explorers, and early biologists. Nonetheless, the last 40 years have seen a much better picture of their biology emerge thanks to, first, dedicated Canadian researchers and, later, truly international efforts of workers from many countries. Veterinarians have contributed to our knowledge of the bears by delivering and monitoring anesthesia, obtaining blood samples, performing necropsies, investigating their reproduction, conducting radiotelemetry studies, and examining their behavior. Recently, new technologies have been developed that revolutionize the study of the lives and natural history of undisturbed polar bears. These advances include better satellite radiotelemetry equipment and the development of remote-controlled miniature devices equipped with high-definition cameras. Such new modalities provide dramatic new insights into the life of polar bears. The remarkable degree of specialized adaptation to life on the sea ice that allowed the bears to be successful is the very reason that the bears are so vulnerable to the effects of climate change. Polar bears have few alternatives if their habitat (the sea ice) and their access to their ringed seal prey rapidly disappear. Predictions that polar bears may be able to adjust and sustain themselves on alternative food sources are not based on reality. Spring breakup of the sea ice is happening much earlier as well as fall freezeup is getting later, thereby prolonging the open water period that the bears are shore bound. If trends continue and the ice continues to disappear, the effect on polar bears would be devastating. Veterinarians must stay involved in polar bear studies and in multidisciplinary conservation studies dealing with threatened and endangered species worldwide. On account of their training, veterinarians can offer a unique skill set that can provide access to a number of technologies critical to conservation efforts. The oath veterinarians take on graduation from veterinary school charges them to be sworn to the "conservation of animal resources" and in the education of the public. We are only as good as the oaths we keep.

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Introduction

The first wild polar bear I ever laid eyes on was through the foggy window of a bumpy helicopter. I had come with my friend, Dr David Kenny, to Churchill, Manitoba, the "polar bear capital of the world," with a group from the Denver Zoo. Dave had achieved considerable notoriety in 1994 with the births of the famous polar bear cubs, "Klondike and Snow," who had been promptly abandoned by their mother. Dave hand raised the cubs and his efforts and the remarkable story of these little bears caught the hearts and imagination of the city of Denver. We had just landed in Churchill when Dave managed to get us a helicopter ride out to Cape Churchill where the bears start to congregate in early October. The Cape faces north and juts out 30 miles into Hudson Bay. Northwesterly winds, the counterclockwise current of Hudson Bay, and the tremendous outflow of freshwater into the bay from rivers and streams to the north combine to form ice earlier along the Cape and the northwest coast of the Bay. For the bears it is a waiting game. The bears of the western Hudson Bay population return to Churchill every October and gather along the coast in anticipation of the coming ice. Once the sheets of ice have frozen together, the bears journey out on to the ice covering the bay to hunt the ringed seals that sustain them (Figs 1–3).

The helicopter ride was loud and cold. Winds off the bay battered our little craft and the side windows soon fogged up with the mist of our breath. We were flying up the beach to the Cape, past the old military site, past the skeletonlike wreck of the freighter "Ithaca" long asleep in the shallows, and over the forlorn, wind-swept beach. There were only patches of ice visible as we flew past, grease ice and little pancake floes and none of the substantial sheets the bears would need to springboard out to the pack ice and the waiting seals. Then, there it was. It was tiny at first but got larger quickly as we closed the gap. He was egg-nog colored with just a hint of pink in the fading autumn light. He was a young male and he moved purposefully and steadily down to the beach. We circled him widely, giving him plenty of room. He had the characteristic swinging gait and powerful-looking legs. I thought he walked like John Wayne, like he belonged on that beach, like he owned it. He had muscular haunches but his skin and fur hung loose and swung with each step. Dave explained that he had not eaten since the ice of last winter and he had spent his time on shore all summer fasting and attempting to escape the heat and insects. Now he had come to the beach to wait for the ice just like generations of bears before him. He never looked at us or paid any attention to the helicopter. He just kept walking. It was almost like he had some errand to do or somewhere to be. Of



Fig. 1. Mother and cub. Churchill, Manitoba. Photograph courtesy of Dr. Kevin Fitzgerald.

course he did, and it did not have anything to do with either humans or helicopters. He had seen a helicopter before and he was not impressed. I had never seen a polar bear before and I would never be the same. I continued to film him as he disappeared down the beach in the fading sun behind the helicopter. In an instant, I came to understand why, even after more than 20 years, Dave was so excited about these animals.

“Ice Bears”

An iconic species, polar bears have come to symbolize the arctic both for its harsh nature and its savage beauty. The newest of the 8 bear species, they split off from brown bears around 200,000 years ago. The scientific name for the polar bear is *Ursus maritimus* (Latin for “sea bear”) but they are known by many names. In Russian, *beliy medved* (“white bear”); to the Inuit, they are “Nanuk”; in Cree, *Wapusk* (meaning “white bear”); in French, *ours blanc* (“white bear”); for the Lapp people, they are “God’s dog”; in German, *Eisbar* (“ice bear”); and in both Norwegian and Danish, they are called *isbjørn* (“ice bear”). That is my favorite name—“ice bear.”

Polar bears are the world’s largest terrestrial carnivore (although roughly the same size as the omnivorous Kodiak bear). Despite being born on land, they spend most of their lives out on the sea ice and are considered a marine mammal. At present, there are 19 discrete circumpolar populations worldwide and their range extends through 5 countries: The United States (Alaska),



Fig. 2. Mock fighting males. Churchill, Manitoba. Photograph courtesy of Dr. David Kenny.



Fig. 3. Into the sunset. Churchill, Manitoba. Photograph courtesy of Dr. Rick Beldegren.

Russia, Canada, Greenland (Denmark), and Norway (Svalbard). Biologists estimate the current global polar bear population at around 20,000 animals. Most of these populations occur in North America and some 15,000 polar bears are thought to be found in arctic Canada. The white bears do not hibernate. They spend their winters on the sea ice hunting seals, an activity they are spectacularly adapted for.

Life on the Ice

Life at the top of the world is severe and unforgiving. The northern and southern-most regions of our planet receive as much sunlight as anywhere else, but the sunlight hits more obliquely and must penetrate a much thicker atmosphere than other parts of the Earth. As a result, particles of light have a much higher chance of striking molecules of air and using up their energy before they hit the surface of the planet. Additionally, the snow and ice reflect and throw back into space 9 in 10 parts of solar energy that they receive. This causes the higher latitudes to have much less solar radiation available and to subsequently be much colder. The regions display almost 3 months of nearly constant darkness and 3 months of almost constant light. The reduced levels of solar radiation produce a harsh, frozen environment and some very unique habitats. For instance, the growing season is much abbreviated but still dwarf willows, lichens, and mosses somehow hang on tenuously to the vast tundra. Even some spruces somehow survive. However, they are characteristically branded by the relentless arctic winds whose blowing snow and ice crystals shear away buds, needles, and the branches themselves. Branches survive on the leeward side protected by the trunk of the tree itself. This wind shearing gives the trees a forlorn, ragged look, and some stands resemble pirate schooners or old windjammers. Botanists call the spruces “flagged trees,” recognizable for their leeward streamers of wind-battered branches.

One of the most striking features of this northern landscape is the quiet. Many disciples of solitude favor arctic environs. Still, one should never mistake the north for some great benign vastness. The climate is both cruel and savage. However, even in this extreme and pitiless place, life still manages to find a way and seize a foothold. Animals and plants have developed adaptations to adjust and cloak themselves with strategies to survive. The hardy wood frog (an amphibian) and a species of garter snake (a reptile) exist in this region although they are active barely for

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