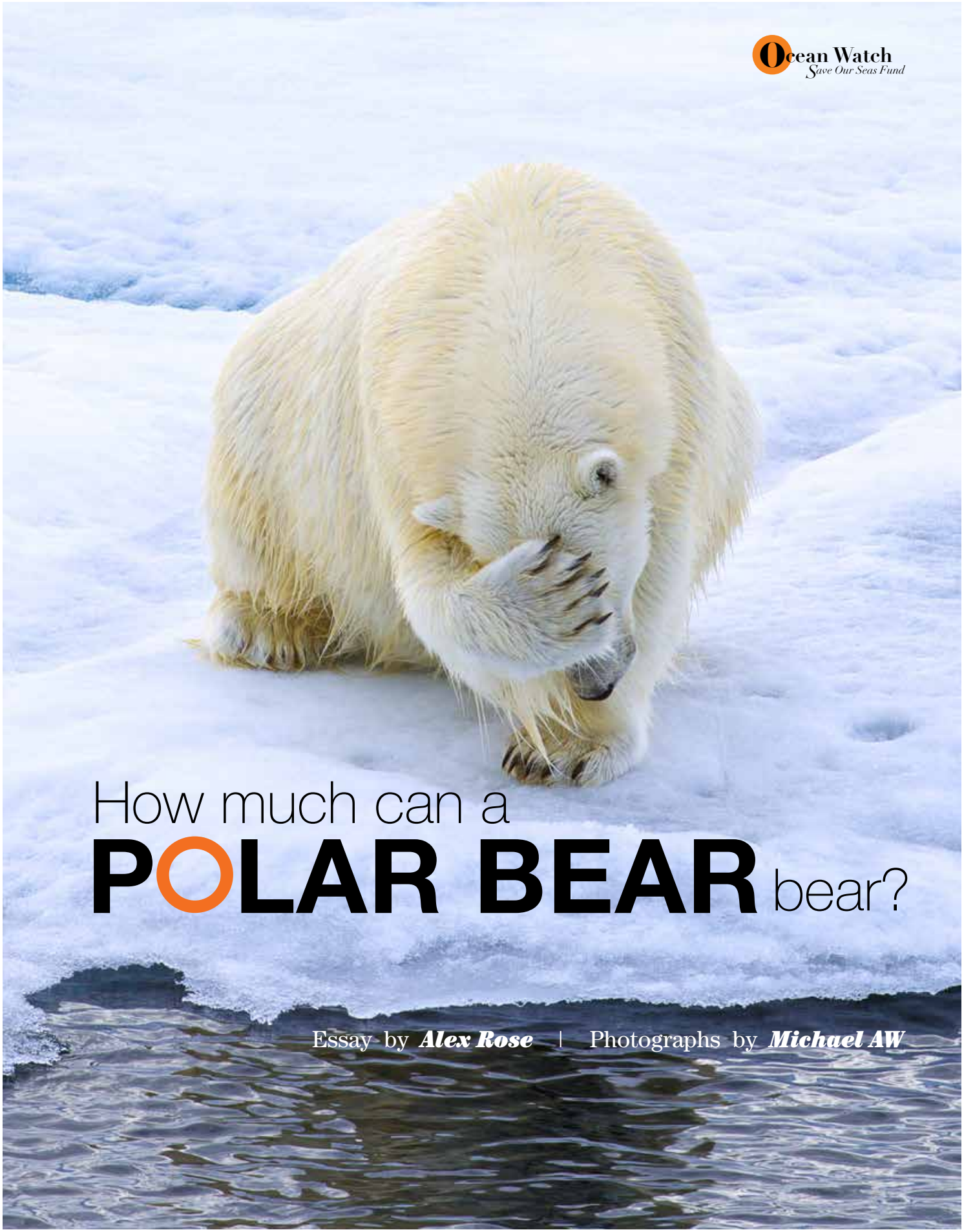

How much can a POLAR BEAR bear?

Essay by ***Alex Rose*** | Photographs by ***Michael AW***

Ocean Watch
Save Our Seas Fund

SCIENTISTS PREDICT THAT THE REDUCTION OF CRITICAL SEA ICE HABITAT WILL CAUSE THE LOSS OF TWO-THIRDS OF THE WORLD'S POLAR BEAR POPULATION BY 2050

and that the species may be extinct by the end of the century.

As temperatures rise, polar bears struggle to survive on melting sea ice.

Polar bears are an icon of the Arctic, but even more than that, they have come to embody the perils of climate change. These charismatic predators intrinsically depend on the presence of sea ice for daily life, and without it, these bears may not be able to adapt to the warming world of our near future. Based on climate change models, scientists have predicted that projected reductions of critical sea ice habitat will be responsible for the loss of two-thirds (about 16,000) of the world's polar bear population by 2050 and that the species may be extinct by the end of the century.

Without sea ice, polar bears would be deprived of their main source of food, pinnipeds (meaning fin or flipper-footed and refering to the marine mammals that have front and rear flippers), and forced to migrate onto land where they are known to be inefficient hunters, leading to high cub mortality rates and underweight bears that cannot reproduce. Reduced ice cover as well as early break-up and rapid movement of sea ice also require bears to expend more energy travelling between their preferred home range and the sea-ice-air interface where they hunt, exhausting them and negatively impacting their reproductive capabilities. They were officially listed as "Threatened" under the Endangered Species Act in 2008 and are the first vertebrate species to gain this classification because of the imminent threat climate change poses to their survival.

Polar bears, *Ursus maritimus*, are uniquely adapted to life on the ice. Their white, water-repellent fur camouflages them against a snowy backdrop, making it easier for them to hunt, while a thick layer of subcutaneous fat helps insulate them against the frigid waters and bitter cold. Their particularly large size reduces the overall surface area to body mass ratio, minimizing exposure to the elements and consequently, energy loss. These huge carnivores can weigh up to 770 kilograms in the case of adult males, while large females do not get much bigger than 450 kilograms. The diet of a polar bear consists almost exclusively of ringed and bearded seals, supplemented by the occasional walrus, beluga whale, and other seal species. This is where loss of arctic sea ice poses the greatest threat.

It is a challenge for a young mother to feed and at the same time provide for her young cub.

Svalbard, Norway - a young bear scaling the perilous steep cliffs of Alkefjellet. It took this young bear over 90 minutes to catch three guillemot chicks.

The seals that make up the majority of a polar bear's diet are ice – dependent pinnipeds with life history habits that polar bears are used to exploiting, so much so that fluctuations in seal populations are directly mirrored in bear populations. Ringed seals (*Pusa hispida*) for example, rely heavily on the presence of stable sea ice for several aspects of their lives including reproduction, feeding, and molting. Ringed seal mothers dig breathing holes in the pack ice with their sharp claws and then construct lairs in the snow above these holes where they can rest and give birth. Their tiny pups have no blubber to insulate their bodies and must remain in the birthing lair much of the time in order to stay warm.

Without sufficient sea ice and an adequate amount of associated snow cover, ringed seals cannot construct these lairs, meaning that their pups will not be protected from the severe cold and may die of hypothermia. Reduced access to sea ice means high seal pup mortality rates, reduced population densities, and consequently less food for polar bears.

Polar bears are not only apex predators that help maintain a healthy marine environment, but have been playing an important role in the cultures of indigenous arctic peoples for thousands of years as well as current wildlife tourism economies. They are an important indicator species due to their susceptibility to the effects of climate change, providing us with a real time example of the future of many arctic species if action is not taken to mitigate the loss of these vital sea ice habitats now.

POLAR BEARS ARE IMPORTANT INDICATOR SPECIES

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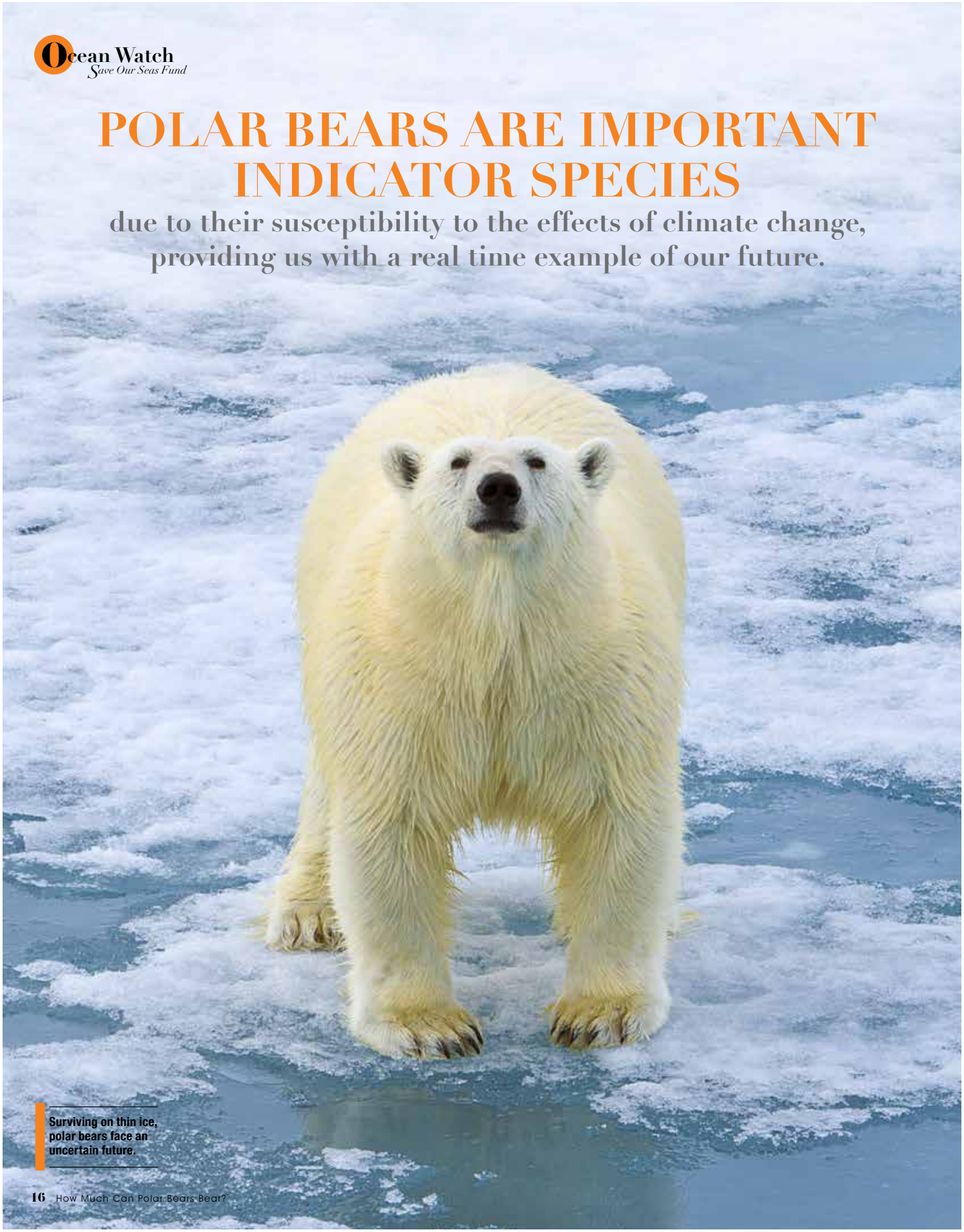

Surviving on thin ice, polar bears face an uncertain future.