

Relative Influences of Climate Change and Human Activity on the Onshore Distribution of Polar Bears

Climate change is altering the physical environment of the Arctic which, in turn, is driving changes in the seasonal distributions of some wildlife populations. For example, polar bears in Alaska have exhibited shifts in habitat use due to the loss of sea ice over the biologically productive continental shelf in summer and autumn. As the spatial and temporal availability of sea ice has declined, polar bears have become more reliant on land, coming ashore in greater numbers and staying longer. Concomitantly, changes in the physical environment have facilitated increased human activities, including those associated with oil and gas exploration and extraction. Collectively, these changes have the potential to lead to increased levels of human-polar bear interaction and conflict.

In a soon to be published study, researchers from the U.S. Fish and Wildlife Service (FWS) and the U.S. Geological Survey (USGS) characterized factors influencing the distribution and abundance of polar bears while on shore in Alaska. Research findings indicated that the numbers of bears observed on shore varied relative to sea ice conditions while their distribution was most strongly influenced by the presence of bowhead whale carcasses.

FWS and USGS scientists analyzed 13 years (2001 to 2014; excluding 2006) of aerial survey data to estimate the weekly number and distribution of polar bears along the coast and on barrier islands of northern Alaska in autumn. The numbers of bears on shore were most strongly related to the dates of sea ice retreat from and sea ice return to the continental shelf, with more bears observed on land in years with later dates of ice retreat and return. Nearly 60% of all bears observed were on or adjacent to Barter or Cross islands, where the unused remains of subsistence-harvested bowhead whales are aggregated.

While the number of bears on shore was related to sea ice dynamics, their onshore distribution was most strongly influenced by subsistence whaling activities. There is likely little that can be done to reduce the number of bears coming to land, however human-polar bear conflict in coastal settlements might be significantly reduced by managing attractants associated with harvested whales.



Polar bear approaching whale carrion, Kaktovik, Alaska, September 2015. Photo courtesy of Stewart Breck, USDA.



Polar bears feeding on bowhead whale carrion, Cross Island, Alaska, September 2009. USGS photo (public domain).

MANAGEMENT IMPLICATIONS

- A consideration of the role climate change-related distributional changes may play in increasing human-wildlife conflict is critical for informing decisions to support effective resource management and economic development in the Arctic.
- As more polar bears come on shore during summer and fall, there is an increased risk of human-polar bear interaction and conflict, which has the potential to result in more defense-of-life kills, concerns for human safety, and disruption to industrial, recreational, and subsistence activities.
- Management activities associated with how bowhead whale carcasses are handled are likely to be the most influential option in reducing the likelihood of human-polar bear conflict in the region.

THIS BRIEF REFERS TO:

Wilson R.R., E.V. Regehr, M. St. Martin, T.C. Atwood, E. Peacock, S. Miller, and G. Divoky, 2017, Relative influence of climate change and human activity on the onshore distribution of polar bears: Biological Conservation, In Press.

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