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# Climate Change Could Impact Narwhal Consumption by Killer Whales

Climate change related differences in killer whale distributions could result in increased predation of narwhals in the northern Baffin Island region.

SOURCE: Wiley: Global Change Biology  
*By Mykenzee Munaco 05 November 2020*

Climate change is creating warmer ocean temperatures and melting sea ice at polar latitudes. These environmental changes can allow species to expand their normal range to higher latitudes. Killer whales have recently been observed at higher latitudes than they have historically resided in. As a result, there is concern that the narwhal population could experience higher rates of killer whale predation, potentially resulting in the decline of important narwhal populations.

Transient killer whales eat marine mammals and are known to visit the Canadian Arctic in summer months. Their ability to travel north has historically been restricted by the presence of sea ice. However, they have now been recorded traveling further north to the northern Baffin Island region of Canada in the summer because there is no longer ice there during the summer. Narwhals also spend their summers in the northern Baffin Island region and use the ice as protection from killer whales. With little to no ice in this region during seasonal migrations the narwhals will now be left in open water with no protection from their predator.

In a new study, *Lefort et al.* created a model to predict the number of narwhals that could be eaten by migrating killer whales in the northern Baffin Islands region. First, the scientists estimated the population size of killer whales during boat-based surveys. Using a capture-mark-recapture model the killer whale population was estimated to be between 109 and 163 individuals. Next, a bioenergetics model was used to estimate the energetic requirements of the killer whale population. Energetic requirements were estimated to be between 47,053 and 253,803 kcal/day for males and 36,673 and 197,816 kcal/day for females, up to 105 times greater than the average energetic requirements of a human.

Using the energetic data, scientists estimated how many narwhals it would take to fulfill the requirements of the killer whale population by dividing the total summer energetic requirements by a single narwhal's energy content. According to the energetics model, narwhal consumption was estimated to be roughly 1290 narwhals over a 90 day period (summer months).

The scientists note that they are unable to determine the likelihood of population declines in narwhals or the magnitude of the environmental impacts that could occur based on this data alone. Killer whale predation on narwhals could create narwhal population declines or it could also influence narwhals to change their own range distributions into areas with greater sea-ice cover to avoid the killer whales. The number of narwhal deaths could also be under or over-estimated depending on the proportion of narwhals in the killer whales' diet along with other prey items such as seals.

Despite the uncertainty, the results of this study are important in estimating the potential impact of killer whale range expansion on narwhals. These estimates can be used as a foundation for future studies and for conservation management purposes.

**Citation:** Lefort, K. J., Garroway, C. J., & Ferguson, S. H. (2020). Killer whale abundance and predicted narwhal consumption in the Canadian Arctic. *Global Change Biology*.