Hudson Strait Common Eider and Polar Bear Surveys

2016 Field Season Report (NIRB file #06AN026)

Project Overview

The physical characteristics of the Canadian Arctic Ocean have been changing considerably in recent years, due in large part to shifts in the distribution and extent of sea-ice cover. At the same time, industrial interests such as resource extraction are growing in the Arctic. These changes have prompted the development of several marine spatial planning initiatives intended to protect wildlife resources while allowing resource development in the Canadian Arctic. Marine planning requires accurate and current information to be effective. However, available scientific data for credible habitat assessments of marine wildlife in the eastern Canadian Arctic are limited in number, biased by collection method, and outdated.

This ongoing project in Hudson Strait aims to address these information gaps using a variety of new techniques, an established multi-disciplinary research team, and a collaborative approach. We are working to quantify the distribution and abundance of marine birds in the Hudson Strait-Foxe Basin region throughout the year, as well as the biological and physical factors determining those patterns. Collectively, this information will be integrated into computer simulation models that will assess, as well as anticipate, the possible interactions between bird populations and proposed development activities such as year-round shipping.

Eider Population Monitoring and Response to Polar Bear Activity

Polar bear predation of common eider nests seems to be increasing because of sea ice loss in Hudson Strait. Our team has been working to understand how sea ice loss is influencing polar bear foraging behaviour, and what effects this might have on common eider duck populations.

In 2016 we conducted surveys on 58 islands in three main areas in northern Hudson Strait to continue our long-term monitoring of eider populations. While on the islands we counted the number of active and destroyed common eider nests to quantify nest numbers and nest success. We also counted the number of eggs in each nest, and floated a subset of eggs to estimate when they were laid. While on the islands, we recorded any 'sign' that polar bears had been there, including scat, footprints, and destroyed nests.

This year, we noticed that polar bear predation of eider nests seems to be very localized and site-dependent. In one area, for example, most islands had evidence of polar bear presence, and many nests were depredated. However, in other areas most nests were still active and there were few bears.

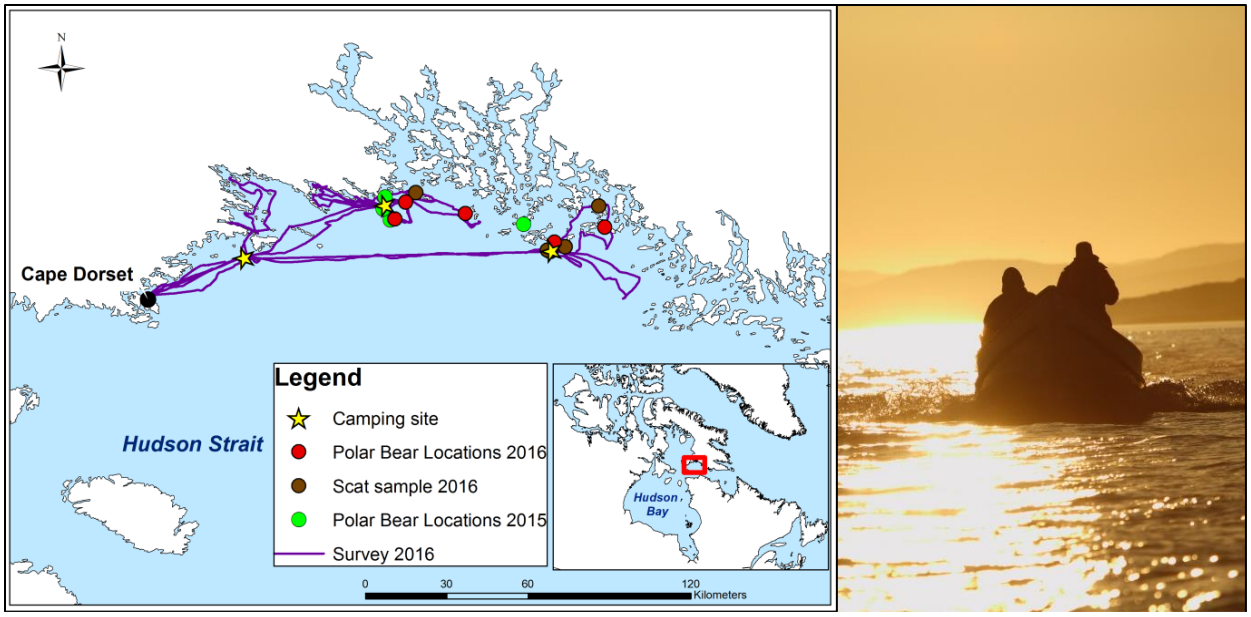
We have been using the data collected from this program to create computer simulation models of how polar bears might behave in the future. Our models suggest that polar bear predation of eider nests is likely to increase as sea ice melts earlier. Additionally, our model shows that large eider colonies might decrease in size, as eiders spread out to other nesting islands to avoid polar bear predation at large nesting colonies.

Polar Bear Behaviour and Genetics

Reductions in the extent of Arctic sea ice have increased the amount of time polar bears spend in terrestrial environments. While on land, bears are known to forage opportunistically making use of terrestrial food resources including eider nests. Although the net energetic benefits of consuming waterfowl eggs appear to be limited for polar bears, the potential population level impacts of such foraging on colonial nesting seabirds may be significant. The primary objective of this research is to quantify individual polar bear foraging behavior at eider colonies through boat-based observations. We will determine the extent to which individual bears influence nest success rates within and across eider colonies. Genetic identification of individual bears will allow us to assess the extent to which foraging behavior is learned or genetic. To identify individual genotypes, swimming polar bears were remotely biopsied from freighter canoes to obtain tissue samples.

In 2016 we conducted boat-based surveys in the Hudson Strait east of Cape Dorset for polar bears around known eider colonies. Surveys were conducted from July 6 to July 23 and covered a total distance of 1310km. We encountered 6 polar bears including 1 family group consisting of an adult female accompanied by a cub-of-the-year. We obtained tissue samples from 4 bears (accompanying bears were not sampled in this project) and 1 bear was unable to be biopsied because of thick fog resulting in poor visibility. Genetic analysis is currently underway from the samples collected in 2016.

Cody Dey presenting the findings of our research on local radio in Cape Dorset.



2016 Surveys showing polar bear locations and location of scat samples. 2015 polar bear locations are shown for reference.

During the 2016 field season we met with the local HTO and summarized the field season on the local radio. Feedback from the community and Inuit guides was positive. Poor weather conditions from heavy fog occurred from July 11 to July 14 where surveys could not be conducted.

In general, bears were seen in similar areas as those seen in 2015 (see map above). In addition to collecting 4 biopsy samples from polar bears we collected 8 scat samples within the study area. The goal of collecting the scat samples is to determine whether genetic identification can be determined using non-invasive methods. Weather patterns in 2016 resulted in favourable ice conditions with little ice in most areas surveyed. Inuit local knowledge suggests that more bears are found in the areas we surveyed when there is ice around. According to one Elder, when fast ice is present there can be a bear near every island.

Disease Monitoring

Since 2012, coastal eider colonies in Nunavut and Nunavik have been monitored to detect evidence of avian cholera outbreaks. To date, cholera has been detected near communities in Nunavik (Aupaluk and Inukjuak), as well as at East Bay on Southampton Island. There has been no evidence of avian cholera near Cape Dorset, but monitoring of the islands is ongoing so that if the disease emerges it can be detected as soon as possible.

For more information or to report suspected avian cholera at a colony contact Catherine Soos (Environment and Climate Change Canada, Catherine.Soos@Canada.ca) or the Canadian Cooperative Wildlife Health Centre (1-800-567-2033).

Future Plans

- Assessing and quantifying the impact of polar bear predation on common eider population size, age structure and colony persistence.
- Identifying particular areas in Hudson Strait where eiders are likely to decline in numbers, and areas where they are likely to increase.
- Determining how interactions between polar bears, Arctic fox, gull, and human predation on eiders will influence their populations.
- Continued collection of biopsy samples of polar bears to increase sample size.
- Investigating links between common eider colonies and other species that utilize the same island habitats (e.g. snow buntings, red-throated loons).
- Continued monitoring of avian cholera and other disease epidemics affecting birds.
- Ongoing handover of basic population monitoring to local communities.

Research Partners and Financial Support

A multi-disciplinary approach to research requires a significant level of logistical support. Dr. Grant Gilchrist (Environment and Climate Change Canada (ECCC)), Dr. Christina Semeniuk (University of Windsor), and Dr. Evan Richardson (ECCC) are the primary investigators for this project. The science team in the field this summer included Cody Dey, David McGeachy, Daniel Taukie, Meagan McCloskey, Sjoerd Duijns, and Samuel Richard. The project coordinator in 2016 was Jake Russell-Mercier (ECCC). Expert guiding was a key component of this study and was provided by local guides and assistants Numa Ottokie, Salomonie Aningmiuq, Charlie Qiatsuq, Luutaaq Qaumagiaq, Adamie Qaumagiaq, Kovianaqtuliaq Ottokie, Tutuiya Qatsiya, and Peter Ottokie. Support in Cape Dorset was provided through the Cape Dorset HTO by Adamie Nuna, Annie Suvega, and Members of the Board.

2016 field crew: Top row (L to R) Kov Ottokie, Samuel Richard, Charlie Qiatsuq, Luutaaq Qaumagiaq, Daniel Taukie, Cody Dey, Adamie Qaumagiaq, Megan McCloskey, and Sjoerd Duijns. Bottom row (L to R) David McGeachy, Numa Ottokie, and Salamonie Aningmiuq.

Research in Canada's North is expensive and funding for this work is necessarily provided by a network of partnerships that includes: Environment and Climate Change Canada Wildlife Research Division, the Canadian Wildlife Service, Baffinland Iron Mines, Mitacs, The Pew Charitable Trusts, Oceans North, Nunavut General Monitoring Plan, ArcticNet, Polar Knowledge Canada, Northern Scientific Training Program, NSERC, Carleton University, and the University of Windsor. Importantly, The Nunavut Inuit Wildlife Secretariat and the Qikiqtaaluk Wildlife Board facilitated efficient payment of guides.

Contact

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