Arctic Coastal Birds and Ecosystems

Environment and Climate Change Canada
2018 Field Season and Research Report

2018 Field Season Overview

Our research program is focused on the ecology and conservation of Arctic birds and their habitats. Two key themes are 1) evaluating the influence of changing conditions in the Arctic on the breeding ecology of tundra birds and 2) developing innovative approaches to improve knowledge of population status.

One important focus of our work is to understand the effects of overabundant Arctic geese on species such as shorebirds and gulls that nest in the same areas. Few studies have evaluated the impact of overabundant geese on other birds but the possibility exists for strong effects, operating through habitat change or altered predator/prey dynamics. Another key current project involves the use of tracking technology (primarily the MOTUS network) to enhance the monitoring of bird populations. We're combining modern technology with modern statistical methods to integrate behavioral data into monitoring programs, in order to improve our understanding of birds' population status. At the core, our research seeks innovative solutions to conservation challenges.

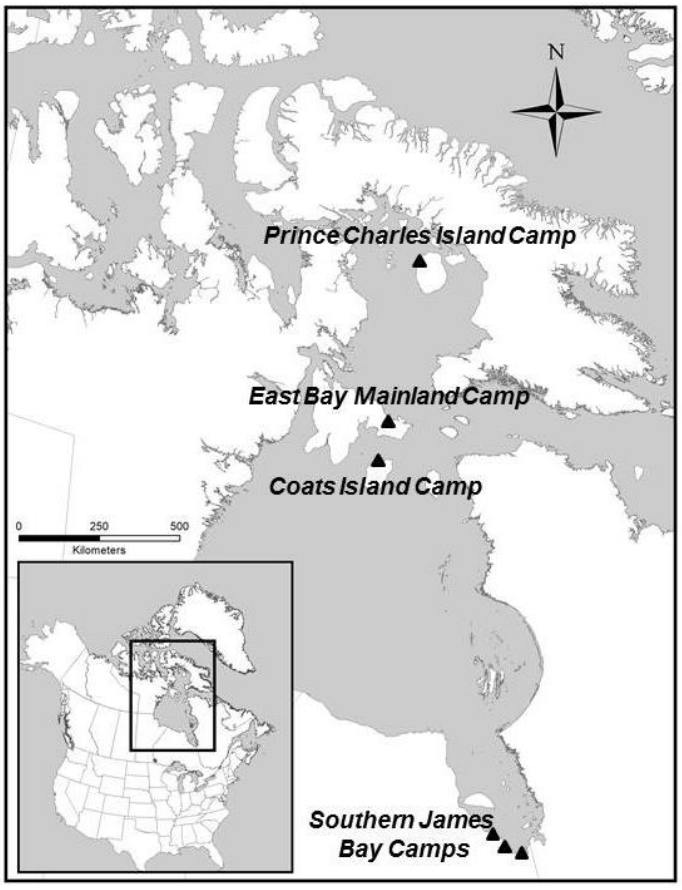

Figure 1. Map of ECCC shorebird research sites in the eastern Canadian Arctic and SubArctic James Bay.

The field camp at East Bay Mainland in early June, 2018

In 2018, we operated out of our primary low-Arctic field site (Figure 1): East Bay Mainland (Qaqsauqtuuq) on Southampton Island, NU. This year marks twenty years of continual monitoring of Arctic-breeding birds, vegetation and climate by Environment and Climate Change Canada (ECCC) from the East Bay Mainland Camp. This site has become one of the most valuable long-term northern monitoring and research stations in Arctic North America. We also carried out field studies in southern James Bay, in collaboration with the Canadian Wildlife Service (CWS). These James Bay sites are used by thousands of shorebirds during their southward migrations in July - September. We did not work at the Coats Island or Prince Charles Island shorebird sites in 2018, although we plan to revisit Prince Charles Island in 2019, and continue to use the data collected there in previous years in our research.

East Bay Mainland

2018 was a year of difficult weather and snow conditions across the Eastern Arctic, and this presented several challenges for the shorebirds breeding at East Bay. The late spring likely contributed to the small number of shorebird nests found: 57 nests were found in 2018, compared to 131 nests in 2017, making 2018 one of the lowest nest counts in the 20 year history of the study. The season was marked by cool temperatures and late snow melt, and similarly bad breeding conditions for shorebirds were observed as far away as Greenland. There were only 5 Red Phalarope nests found this year; much lower than the 61 nests found in 2017.

White-rumped Sandpiper nest with hatchlings at East Bay Mainland

Red Phalarope numbers have varied widely over the 20 years of study, but with the exception of 2017, are much less abundant than they were in the early 2000s. Other species too, especially the Ruddy Turnstone, have declined noticeably in abundance since the late 1990's when monitoring began.

Clockwise from top left: White-rumped Sandpiper (foreground) and Dunlin (background), pair of Red Knots, Semipalmated Plover, and Red-necked Phalarope. Red Knots are an endangered species that has declined by >80% since the 1970s; Southampton Island is one of the most important breeding locations for this species. Red-necked Phalaropes have also declined. They were absent from East Bay in the early 2000s, but are starting to return.

The hatching success of shorebird nests was lower in 2018 than in 2017, but still better than 2016 (also a poor year for shorebirds). In 2018, 12% of nests hatched chicks, compared to 21% in 2017, only 4% in 2016 and 0% in 2015. These rates of nest success are lower than for sites elsewhere in the Arctic. Most of these nest failures are due to predation, and Parasitic Jaegers were the primary predator of nests that were monitored by remote cameras. This year there appeared to be lower numbers of nesting geese at East Bay, potentially due to the late spring, and no Snow Goose nests were found near the camp. In turn, predators like Arctic foxes and Jaegers may have turned to shorebird nests as a food source. Unusually high numbers of Ross' Goose were observed compared to previous years, although we did not find Ross' Goose nests near the East Bay camp (most Snow and Ross' Geese nest farther west).

Another notable occurrence this year was a high proportion of abandoned nests (7%, compared to <3% in typical years). This may have been a result of the late snowmelt and cold weather. Alternatively, there were frequent sightings of snowy owls and peregrine falcons that may have nested nearby, and nest abandonment may have been a result of adult mortality due to avian predators. We found that shorebird egg shells were unusually thin in 2018, perhaps due to a lack of food available in the early season while eggs were being developed.

This year, in addition to our normal science program, we recaptured 3 geolocators that had been deployed on Arctic Terns in 2017 as part of a multi-site collaboration with other researchers throughout North America. We had deployed 20 geolocators in 2017 and re-sighted many with geolocators in the early season of 2018. We hoped for a better recapture rate, however recapture was impossible for several individuals due to a storm that flooded all but one of the Arctic Tern nests. One Sabine's Gull with a geolocator was sighted, but no nest was found and this individual was not recaptured. We will attempt to recapture these birds again in 2019.

Research Partners and Financial Support

The research projects described in this report are a combined effort of many people and organizations. Dr. Paul Smith (Environment and Climate Change Canada, ECCC) leads the program together with key collaborators Dr. Erica Nol (Trent University), Jennie Rausch (CWS), Christian Friis (CWS), and Dr. Grant Gilchrist (ECCC). Technical leadership and coordination is provided by Doug MacNearney (ECCC), with assistance and support from Holly Hennin, Bronwyn Harkness, Bonnie Taparti, and Zaya Kuyena (ECCC).

These projects are all logistically complicated and labour intensive, requiring a large, dedicated crew of students and biologists. Our East Bay Mainland field crew in 2018 included Jupie Angootealuk, Lenny Emiktaut, Willow English, Noah Korne, Doug MacNearney, Josiah Nakoolak, Brandan Norman, Keenan Peddie, and Dr. Paul Smith.

Research in Canada's north is expensive and funding for this work is necessarily provided by a network of partnerships that includes but is not limited to: Environment and Climate Change Canada Wildlife Research Division, the Canadian Wildlife Service – Northern Division, The Bureau of Ocean Energy Management, The United States Fish and Wildlife Service, Trent University, Carleton University, Polar Continental Shelf Program, Agnico Eagle Mines Ltd., Baffinland Iron Mines, Northern Scientific Training Program, the Natural Sciences and Engineering Research Council, and the W. Garfield Weston Foundation.

An American Golden Plover at East Bay Mainland

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