



COASTAL SURVEYS IN THE BELCHER ISLANDS

2022 FIELD SEASON REPORT

ENVIRONMENT AND CLIMATE CHANGE CANADA

PROJECT OVERVIEW

The objective of this project was to survey the breeding population of common eider ducks nesting in the Belcher and Sleeper Island Archipelagos, in south eastern Hudson Bay. The results of these new surveys (conducted in 2021 and 2022) will be compared to historical information collected on the same islands. This will contribute to a long-term study quantifying the population size and nesting distribution of eider ducks in the region which has not been assessed since 1997.

This survey is timely because there is concern that eiders nesting in the region are experiencing rapid ecological changes that could result in population declines or redistribution. Eiders are known to be sensitive while nesting, and can be impacted by outbreaks of avian disease, human disturbance, or cascading impacts of climate change including higher rates of polar bear nest predation.

Eider ducks are also of considerable economic and cultural importance to Inuit harvesters living in Sanikiluaq, Nunavut. The survey represents a collaborative effort between the local Hunter's and Trappers Association, the Arctic Eider Society, and Environment and Climate Change Canada. In 2021, a first field team surveyed nearly half of the targeted islands. In 2022, the survey was led by 11 Inuit from Sanikiluaq, one southern-based Master's student, and two northern-based ECCC employees with logistical and data management support from the Arctic Eider Society and ECCC. Very challenging sea ice conditions prevented accessing two targeted regions before the end of the nesting season. Despite this, the team still surveyed 75 islands in two other targeted regions.



ESSENTIAL INUIT LEADERSHIP

It became clear early in 2020 that the impact of the COVID-19 pandemic would have profound and widespread impacts for everyone across Canada, and particularly those living in remote Northern communities. A key priority for our ECCC science team was to limit any potential impact of our field-related activities on Northerners. This resulted in the cancellation of all field activities in 2020.

In 2021, after a year of delay, the community of Sanikiluaq and the local Hunters and Trappers Association expressed renewed interest to conduct the eider duck surveys with the support of Environment Canada staff who were working remotely. Virtual planning meetings were held between the Hunter's and Trappers Association, the Arctic Eider Society, and ECCC.

2022 Sanikiluaq Survey Team

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Charlie Novalinga
Isaak Takatak
Jimmy Derek Iqaluq
Jimmy Iqaluq
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In both 2021 and 2022, the local HTO and the Arctic Eider Society recruited and hired the survey crew and organized most field logistics. During both years, the boat-based surveys were led by a team of Northern, community-based Inuit from Sanikiluaq (see alphabetical list of team members). Funding and data management was provided by the Nature Fund of Environment Canada, the Canadian Wildlife Service (Northern Region), and the Arctic Eider Society. All agreed that this was an exciting step to grow the research capacity within Sanikiluaq and served as a model example for establishing other community-based environmental monitoring programs in the Canadian Arctic.



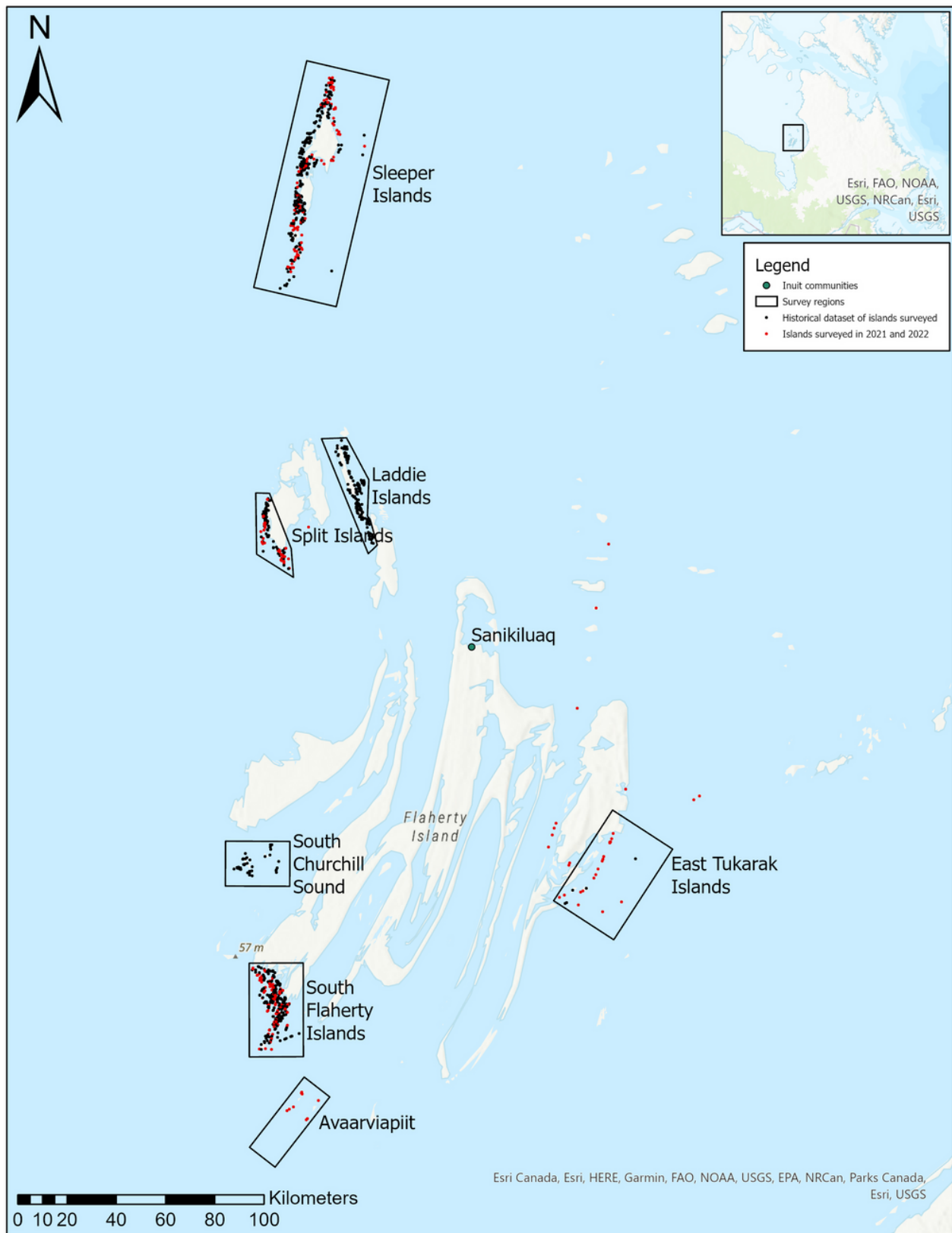
CONTRIBUTING TO MARINE PROTECTED AREAS

The formal protection of the Marine Environment is a national priority. In the Arctic, Government Departments and local communities are working together to identify areas worthy of protection. The spatial use of the ocean by wildlife is one element that is considered when designing the scale and location of marine protected areas.

Our team is helping to support the community-based surveys of marine birds in the Belcher Islands as part of our mandate to monitor Canada's populations of migratory birds, but also to help update what is known about the breeding distribution of key species, including common eider ducks. Coastal boat-based surveys were conducted previously in the region during the 1980s and the 1990s. In 2021, a first field team visited 202 islands in the Sleeper, the South Flaherty, and the Avaarviapiit Islands. In 2022, between July 6 and July 23, 63 islands were surveyed in the East Tukarak and the Split Islands regions. An additional 12 islands known to local hunters to be important eider colonies were surveyed outside the targeted areas (see map on pg. 4). Survey teams arrived to islands by boat and by walking transects, counted the number of active eider nests, and recorded their clutch sizes. No eiders were captured, nor were any biological samples collected for research purposes during the surveys.

By conducting these new surveys in 2021 and 2022, we will be able to evaluate the continued importance of historic nesting colonies as well as identify new nesting colonies if they exist. This information will be shared with the community to help inform ongoing discussions about establishing a Marine Protected Area in the region.





Map of the Belcher and Sleeper Islands. Boxes indicate different survey subregions. Red dots indicate islands surveyed in 2021 and 2022. Black dots indicate islands included in previous surveys (i.e. 1980s and 1990s) that could not be revisited due to sea ice or weather constraints.

Learnings from collaborative monitoring of remote wildlife populations: factors affecting changes in number and distribution of nesting Hudson Bay eiders ducks in the Belcher Islands

Samuel Richard (M.Sc. Candidate at Carleton University with Drs. Vivian Nguyen and Grant Gilchrist)

The warming Arctic temperatures are causing a reduction of sea ice extent and are increasing the length of ice-free seasons. For common eider ducks, this may provide earlier access to food resources. However, it also leads to increasing nest predation by polar bears. In the conservation effort, efficient management requires up-to-date and accurate information about the population dynamics, habitat requirements, and distribution of organisms.

Analyzing the data collected through this long-term collaborative monitoring, we found that the eider population nesting in the Belcher Islands did not fully recover from a drastic population decline that occurred in the early 1990s. We also found that nesting eiders were more dispersed after the decline, and that larger colonies had a lower probability of extinction but declined more steeply than smaller ones over time. This suggests common eiders are facultative colonial nesters and dispersed nesting may be more beneficial for them in complex archipelagos like the Belcher Islands.

There is increasing appreciation of the benefits of coproduction to increase our understanding of the rapidly changing ecosystems. To contribute to this ongoing discussion, we identified, within our research program, practical challenges and associated solutions to the implementation of respectful approaches in collaborative monitoring involving large institutions (e.g. ECCC) and remote Indigenous communities. We highlighted challenges associated with 1) co-designing survey methods, 2) administrative constraints to hiring and paying local fieldworkers, and 3) maintaining continuous worker safety. To overcome these challenges, we suggested that 1) combining Inuit Knowledge with rigorous random sampling could yield a more robust dataset, 2) financial and hiring administration must be based at the community level, and 3) the safety guidelines should be co-designed to ensure they meet high safety standards while reflecting local culture and field conditions.

PUBLICATIONS

Richard, S., Gilchrist, G., Hennin, H., and Nguyen, V. Collaboration between local Indigenous and visiting non-Indigenous researchers: practical challenges and insights from a long-term environmental monitoring program in the Canadian Arctic. **Ecological Solutions and Evidence** (Under review).





RESEARCH PARTNERS AND FINANCIAL SUPPORT

The research conducted in the Belcher and Sleeper Islands is a combined effort of many people and organizations. The project is co-led by Grant Gilchrist (Environment and Climate Change Canada; ECCC-S&T, Ottawa), Lucassie Arragutainaq (Sanikiluaq HTO), Joel Heath (Arctic Eider Society), and Lisa Pirie (ECCC-CWS, Iqaluit). Support in Sanikiluaq is provided through the Sanikiluaq Hunters and Trappers Organization, and especially by Lucassie Arragutainaq. Thanks to the survey team (listed on Page 2), and to Samuel Richard (Carleton University), Charlie Nakashuk (ECCC-CWS), and Clément Chevalier (ECCC-CWS) in the surveys and who provided photos for this report. Holly Hennin (ECCC-S&T) and Sam Richard (Carleton University) contributed logistical and administrative support to the project from Ottawa, Ontario. Greg Robertson (ECCC-S&T), Vivian Nguyen (Carleton University), and Dominique Henri (ECCC-S&T) contributed to survey design and community partnerships.

Research in Canada's north is expensive and funding for this work is provided by a network of partnerships that included the Canada Nature Legacy Fund, Environment and Climate Change Canada (ECCC; Canadian Wildlife Service and Wildlife Research Division), Research Trust of the Nunavut Wildlife Management Board, the Nunavut General Monitoring Plan, the Arctic Eider Society, ArcticNet, Carleton University, and the Polar Continental Shelf Program (PCSP).

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