



ENVIRONMENT AND CLIMATE CHANGE CANADA

# ARCTIC SEA DUCKS & ECOSYSTEMS



2025 FIELD SEASON AND RESEARCH REPORT



# PROJECT OVERVIEW

Eider ducks are harvested for their meat, eggs, and feathers in Nunavut, Canada, Atlantic Canada, and west Greenland. The population trends of eiders have been monitored by conducting surveys of their nesting colonies along the south coast of Baffin Island since the 1950s. These summer surveys identified that the eider population was being overhunted on their wintering grounds and helped to establish new harvest regulations implemented in Greenland in 2002. The Canadian breeding population began to recover. Recently, concern has grown that eiders are being killed incidentally by the coastal gill net Lump sucker fishery on their wintering grounds in Greenland. One of the only ways to assess whether winter mortality is generating population declines of birds breeding in Canada, is to repeat surveys of their nesting colonies during the summer in Nunavut.

The specific research goals of this study include:

1. Quantify the current distribution of eiders nesting on offshore islands and estimate the current size of their nesting population.
2. Quantify the prevalence of polar bear nest predation on islands, and whether it varies by island size, nest density, or geographically.
3. Detect eider mortality caused by avian diseases (e.g., avian cholera, avian influenza) if it occurs and quantify potential timing and geographical extent of mortality.
4. Explore if any detected changes in colony size/distribution impacts the ability of local Inuit to harvest common eiders for personal subsistence.



# CONTRIBUTING TO OCEANS PROTECTION PLANNING

The Oceans Protection Plan (OPP) is a Government of Canada program which focusses on enhancing Canada's preparedness and ability to respond to marine pollution incidents, particularly oil spills. Through the OPP, the Wildlife Research Division (WRD) conducts research on marine ecosystems to develop tools to predict and mitigate the risks to marine birds and polar bears from shipping, and to support science-informed decision-making.

Under OPP, in July of 2024, we initiated a new multi-faceted project in collaboration with the community of Kinngait, Environment Canada, the Nunavut Wildlife Research Trust of the Nunavut Wildlife Management Board, and the Sea Duck Joint Venture. As part of our long-term monitoring program led by ECCC, we are resuming surveys of common eider nesting colonies in the Hudson Strait, first initiated by Dr. Graham Cooch in the 1950s. The surveys are repeated roughly every 10 years.

We aim to determine how the density and distribution of common eiders nesting on coastal islands has changed over nearly 70 years. Not only to inform OPP mandates, but to also inform a related, NSERC-funded social-science project led by Drs. T. Semeniuk (U of Windsor), V. Nyguen (Carleton U), and D. Henri (ECCC), which is currently examining how changes in colony distribution and size may be generating challenges and new costs associated with harvesting common eider ducks by the community of Kinngait.



*Eider surveys based out of Kinngait (formerly Cape Dorset) have been conducted in 2024 (red dots) and 2025 (black dots).*

# SEA DUCK JOINT VENTURE

Sea ducks are a large group of waterfowl that little is known about, especially when compared to other waterfowl species. Many sea duck species depend on sensitive coastal, arctic, and boreal habitats throughout the continent. Some sea duck populations are declining in North America or have lower numbers than they did historically.

The Sea Duck Joint Venture (SDJV) contributed research funds in support of the Baffin Island coastal surveys in 2025. The SDJV is an American and Canadian conservation partnership, lead by wildlife organizations committed to maintaining sustainable populations of North American sea ducks throughout their ranges. The Joint Venture contributes research funding directly to support sea duck research, monitoring projects, and outreach programs intended to improve understanding required for effective population and habitat conservation throughout North America, including the Arctic. Projects are cooperatively funded by American Congressional appropriations and partner contributions.



The SDJV, in collaboration with Ducks Unlimited, Inc., has also developed a graduate student fellowship program to support research on North American sea ducks. The goal of the program is to increase the number of skilled early career professionals interested in sea duck research, management, and conservation. **Shayla Kroeze** (Queens University), and **Kt Miller** (Carleton University) have received Student Fellowship Awards to support their graduate research of common eider ducks.



To learn more, please visit the SDJV website:  
[seaduckjv.org](https://seaduckjv.org)



## Socioeconomics of Mitiq (Eider Duck) Harvest to Support Food Security and Well-being

**Katharina (Kt) M. Miller - Ph.D. Student, Carleton University with Drs. Dominique Henri and Vivian Nguyen**

In northern Indigenous communities, subsistence harvest is critical to food security and well-being. Eider ducks, are harvested widely by coastal Inuit communities for meat, eggs and feather down. Climate-induced early sea-ice breakup can benefit eider reproduction, increase nesting opportunities and therefore increase potential food availability to Indigenous communities. At the same time, earlier sea-ice melt is increasing the risk of eider nest predation by polar bears that now spend more time on shore, thereby reducing the number of eggs to harvest and imposing serious safety risks to harvesters.

To anticipate the consequences of climate change, harvesting, and polar bear predation on eider abundance and distribution it is critical to develop an understanding of Inuit Qaujimajatuqangit (IQ – Inuit knowledge) of duck hunting, egg picking, and down collecting in order to analyze both their economic and cultural value.



*Common eider nest*

This summer, Kt joined our field team conducting coastal eider duck surveys between the communities of Kinngait and Kimmirut to begin her doctoral studies. She worked to codesign her research with the Inuit crew and gathered data on the costs of harvest, ensuring that IQ was embedded in her research. Overall, Kt aims to bring together knowledge from Inuit ways of knowing, ecology, and economics to support food security and Inuit research priorities.



## How Genetics might have influenced the response of Common Eiders to Avian Cholera

**Shayla (Shay) Kroeze - Ph.D. Student, Queen's University Drs. Vicki Friesen and Grant Gilchrist**

Arctic species are beginning to face novel diseases, in part due to warmer climates increasing the exposure of wildlife to disease vectors (e.g., mosquitoes). However, the genetics of disease resistance in wild populations is surprisingly lacking, particularly in Arctic species. From 2005-2012, the common eider colony on East Bay Island experienced several outbreaks of avian cholera, resulting in high mortality rates and decreased reproductive success. Since 2011, the mortality rate of female eiders has been less than 1%, likely due to herd immunity. However, it is unknown why in years of high cholera mortality, some eiders died while others survived.



Shay will examine the role of genetics in contributing resistance to cholera among eiders. She will analyze whole genome sequences from our archive of eider blood samples that both survived the cholera epidemic and did not, as well as from eiders that were found to have a strong immune response to cholera based on antibody levels. This will be accompanied by a long-term dataset on immune-related variables in these eiders such as age, body size, etc. She will test for correlations between variation in genes and cholera resistance controlling for immune related variables, specifically focused on genes previously found to be involved in immunity in other bird species. Additionally, Shay will explore how these genes changed in frequency before, during, and after the outbreaks, as well as in colonies that have never been exposed to cholera. Results from her research will provide rare information on the population genetics of disease resistance in wild populations, and the vulnerability of Arctic bird species to emerging infectious diseases.







## PUBLICATIONS

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Álvarez-Manzaneda I, KM Rühland, M Campbell, MP Duda, ML Mallory, N Clyde, HG Gilchrist, KE Hargan, JP Smol. 2025. Exploring the potential of nest archives for establishing long-term trends in local populations of an Arctic-nesting colonial sea duck. **PLOS One** <https://doi.org/10.1371/journal.pone.0332605>.

Barnas A, C Simone, E Geldart, OP Love, P Jagielski, HG Gilchrist, E Richardson, C Dey, CAD Semeniuk. 2024. An interspecific foraging association with polar bears increases foraging opportunities for avian predators in a declining Arctic seabird colony. **Ecology and Evolution** 14:e11012. DOI: 10.1002/ece3.11012.

Clairbaux M, M Ronka, T Anker-Nilssen, Y Artukhin, J Danielsen, M Gavrilov, HG Gilchrist, E Snaer Hansen, A Hedd, R Kaler, K Kuletz, B Olsen, M Mallory, FR Merkel, H Strom, J Fort, D Gremillet. 2024. An ecologically sound and participatory monitoring network for Pan- Arctic seabirds. **Conservation Biology** 38: e14287.

Gilchrist, HG, HL Hennin, EI Buttler, JF Provencher, J Nakoolak, PA Smith, M Janssen, MR Forbes, CAD Semeniuk, K Allard, J Bety, N Clyde, S Descamps, F Jean-Gagnon, DA Henri, P Legagneux, C Macdonald, FR Merkel, A Mosbech, E Richardson, C Soos, C Sonne, M Wayland, OP Love. 2025. Long-term monitoring of Arctic birds at the East Bay Island Field Station, within the Qaqsauqtuuq Migratory Bird Sanctuary, 1996–2023. **Arctic Science** 11. <https://doi.org/10.1139/as-2025-0040>

Richard S, HG Gilchrist, HL Hennin, VM Nguyen. 2023. 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** 4 (3).

Sequeria AMM, et al. 2025. Global tracking of marine megafauna space use reveals how to achieve conservation targets. **Science** 388 (6751): 1086-1097. DOI: 10.1126/science.adl0239.

Songsthaugen SA, RE Wilson, R Turner, MJ Fortin, HG Gilchrist, and V Friesen. 2024. Wintering grounds leave their mark: where birds winter influences genomic structure in Arctic nesting common eider ducks. **Conservation Genetics** 1-13.

## 2025 SURVEY TEAM

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### Paulassie Ottokie

was a boat captain on the team in 2025. He has worked on the boat surveys for multiple decades and is an extremely knowledgeable elder. He's an excellent translator of language and culture in both English and Inuktitut.



### Sao Pee

was a boat captain on the team in 2025. He has also contributed to the boat surveys for multiple decades. He is an extremely knowledgeable Elder who is passing on intergenerational knowledge to his grandson, James, as his assistant and to the rest of the crew.



### Adami Qaumagialq

was a boat assistant and boat captain on the team in 2025. He has joined previous boat surveys, and loves to be on the land and busy working. He is also a skilled and well known carver in the community.



### Pootoogook Elee

has lived in Kinngait his entire life and works to help coordinate the many logistical aspects of the eider project within the community.





## Pudloo Matthewsie

was a boat assistant on the team in 2025. Pudloo is extremely hardworking and cheerful, especially when he is busy and travelling on the land.



## James Pee

was a boat assistant on the team in 2025. The youngest member of our team, James was mentored by his grandfather, Sao, to learn intergenerational knowledge of the south Baffin Island coast. Known fondly by the crew as “Jamesie”.



## Pabinaq Petaulassie

was a boat assistant on the team in 2025, known fondly by the crew as “Pabs.” He is a keen, eager, and hard-working younger generation crew member who appreciates the opportunity to learn from the intergenerational knowledge of the elders and contribute to eider duck conservation.



## Lerena Ashevak

was a valued research assistant on the team in 2025 and has already begun her Master’s research at the University of Windsor in the fall of 2025



## Symiuny Jaw

is a highly skilled outdoorsperson who provided additional logistical support to the project with his boat, to help set up and demobilize our remote field camp.



## Kt Miller

(Ph.D. 2024-2029, Carleton University) is a graduate student exploring the links between socioeconomics of eider harvest, food security, and intergenerational knowledge transfer with the community of Kinngait, Nunavut. She is the recipient of the Carleton University International Doctoral Excellence Award, Maatje Nix Memorial Scholarship, and Sea Duck Joint Venture Fellowship. This was her second season working on the surveys.



## Scott Gilliland

is a waterfowl biologist who worked with the Canadian Wildlife Service of Environment Canada for over 30 years and has a particular focus on common eider conservation in eastern Canada and the Canadian Arctic.



## Grant Gilchrist

is a research scientist with Environment Canada who studies the biology of seabirds and sea ducks in the eastern Arctic. He has been co-leading the coastal eider duck surveys with the community of Kinngait since 1996.















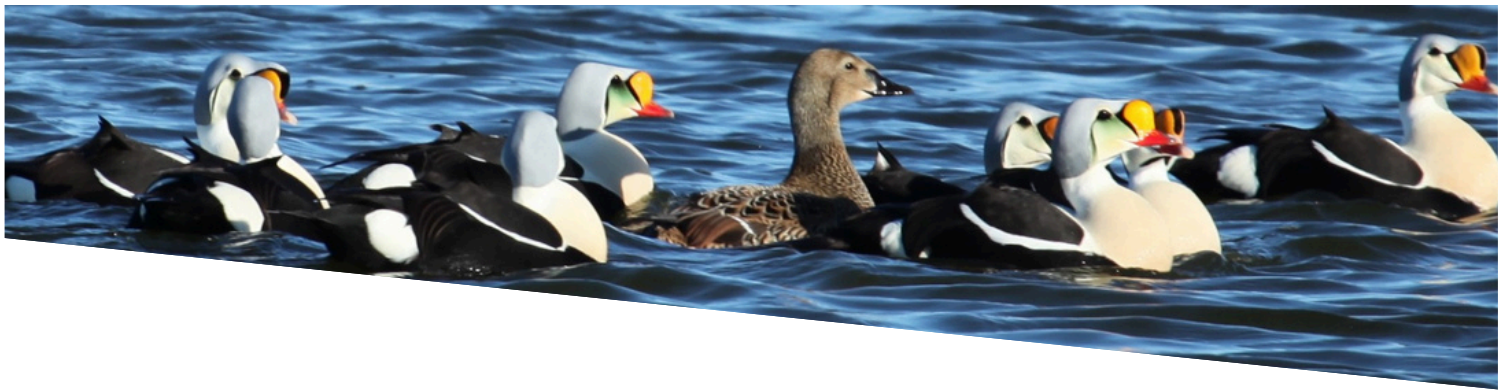












## RESEARCH PARTNERS AND FINANCIAL SUPPORT

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Our research in Kinngait is a combined effort of many people and organizations. The Eider Colony Survey project is co-lead by Grant Gilchrist (Environment and Climate Change Canada; ECCC), Holly Hennin (ECCC), Scott Gilliland (Acadia University), KT Miller (Carleton University), and the community of Kinngait. Support in Kinngait is also provided by the Aiviq Hunters and Trappers Association. The Survey Project also compliments an ongoing social science research study in the community, examining the effects of climate change on eider duck harvest in Kinngait, led by Dominique Henri (ECCC), Tina Semeniuk (U of Windsor), and Vivian Nguyen (Carleton U).

The eider surveys along the coast of south Baffin Island are logistically complicated and labour intensive, requiring a dedicated crew of Northerners, students, and biologists. Our survey field crew in 2025 included Lerena Ashevak, Paolassie Ottokie, Pudloo Mathewise, Sao Pee, James Pee, Adami Qaumagialq, Symiuny Jaw, Pabinaq Petaulassie, Chris Pudlat, David Killiktee, Saimunie Ottokie, Grant Gilchrist, KT Miller, and Scott Gilliland, with additional in-town support provided by Pootoogook Elee. Photos in this report have been provided by G Gilchrist, K Miller, and S Gilliland.

Research in Canada's North is expensive and funding for the surveys is provided by a network of partnerships that includes but is not limited to: Environment and Climate Change Canada (ECCC) Wildlife Research Division, Nunavut Wildlife Research Trust, Sea Duck Joint Venture, Baffinland Iron Mines Corporation, Carleton University, and the Polar Continental Shelf Program.

## CONTACT FOR MORE INFORMATION

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