Inuit knowledge about light geese in the Kivalliq region, Nunavut
<table>
<thead>
<tr>
<th>Table of Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>05 Acknowledgements</td>
</tr>
<tr>
<td>09 Executive Summary</td>
</tr>
<tr>
<td>11 Background</td>
</tr>
<tr>
<td>15 Methods</td>
</tr>
<tr>
<td>17 Results</td>
</tr>
<tr>
<td>17 Inuit knowledge about light geese</td>
</tr>
<tr>
<td>18 Past cultural significance of light geese</td>
</tr>
<tr>
<td>19 Current cultural significance of light geese</td>
</tr>
<tr>
<td>21 Light goose population size</td>
</tr>
<tr>
<td>22 Light geese impacts on the land, water, wildlife, and people</td>
</tr>
<tr>
<td>24 Why light geese have moved to new areas</td>
</tr>
<tr>
<td>25 Potential strategies for managing the light goose population</td>
</tr>
<tr>
<td>27 Inuit knowledge about shorebirds and other birds</td>
</tr>
<tr>
<td>28 Past cultural significance of shorebirds and other birds</td>
</tr>
<tr>
<td>29 Current cultural significance of shorebirds and other birds</td>
</tr>
<tr>
<td>30 Shorebird and other bird population size</td>
</tr>
<tr>
<td>31 Why shorebird and other bird population size has changed</td>
</tr>
<tr>
<td>34 Potential strategies for managing shorebirds and other birds</td>
</tr>
<tr>
<td>35 Conclusion</td>
</tr>
<tr>
<td>37 Appendix I – Invitation letter and consent form</td>
</tr>
<tr>
<td>39 Appendix II – Interview questions</td>
</tr>
<tr>
<td>41 Appendix III – Posters used for bird identification purposes during interviews</td>
</tr>
<tr>
<td>45 Appendix IV – Birds of Coral Harbour</td>
</tr>
<tr>
<td>49 Appendix V – Maps</td>
</tr>
</tbody>
</table>
Acknowledgements

The authors wish to thank those who participated in this study as interview participants (in alphabetical order): Matthew Adams, Dino Bruce, Bobby Eetuk, Ayowna Emiktau, Johnny Kataluk, Josiah Nakoolak, Lucassie Nakoolak, Marguerite Nakoolak, Pauloose Nakoolak, Peter Nakoolak, Willie Nakoolak, Leonard Netser, Bobby Saviakjuk, Joe Saviakjuk, Mark Paniyuk, Jerry Paniuq, Danny Pee, Lizzie Pootoolik as well as three participants who wished to remain anonymous; those who participated in the development and implementation of this research as Project Management Committee members: Tapia Jar, Noah Kadlak, Moses Nakoolak, Ron Ningeongan, and Casey Paniyuk; and those who participated in the development and implementation of this research as community researchers: Lenny Emiktau and Bobbie Saviakjuk. The authors would also like to thank Matilde Tomaselli (technical support); Natasha Hattie Ottokie and Louisa Kalai (administrative support); Jason Duffe and Jon Pasher (mapping support); Debby Talbot (graphic design); Nunavut Inuit Wildlife Secretariat / Kivalliq Wildlife Board (project funds administration); Aiviit Hunters and Trappers Organization, Irniurviit Area Co-Management Committee, Sakku School, Troy Netser and the Department of Environment (Coral Harbour Wildlife Office) for project support.

The authors also wish to acknowledge the financial support of Environment and Climate Change Canada, Polar Knowledge Canada, and the Nunavut Wildlife Management Board, and the Nunavut General Monitoring Program. This project was conducted under research license 03.015.17N-M from the Nunavut Research Institute.
Participant biographies

Johnny Kataluk
is from Coral Harbour. He does carvings. He has been a hunter all of his life.

Bobby Saviakjuk
worked with the Hamlet for 39 years and is now retired. He helped make roads. He is a hunter and one time drifted out on the floe edge for 3 days. He works when he can.

Josiah Nakoolak
has been working for 27 years as a bird research assistant/cook/guide/polar bear monitor for Environment and Climate Change Canada.

Joe Saviakjuk
is a member of the HTO, a Canadian Ranger, Search and Rescue volunteer, and a hunter and provider for his family and the community.

Willie Nakoolak
is an active hunter, father, and grandfather who was born and raised in Coral Harbour.

Leonard Netser
is a goose hunter and family man.

Lucassie Nakoolak
is a hunter and provider for his family.

Mark Paniyuk
is a resident of Coral Harbour, an elder, a trapper, and a dog owner of 3.
Marguerite Nakoolak

is a hunter and provider for his family. He worked with the mines in Rankin Inlet. He was born and raised in Coral Harbour.

Jerry Paniuq

Pauloosie Nakoolak

Danny Pee

is very thankful that we are not limited by government in the number of geese and birds we can harvest.

Peter Nakoolak

Lizzie Pootoolik

is a person you can approach for our traditional knowledge. She does not want new generations to lose our culture. She is a teacher in the community.

Noah Kadlak

likes hunting. He has been the chairperson of the Imiuviit Area Co-Management Committee since 2012, and was involved in the Aiviit Hunters and Trappers Organization for 20 years.
**Executive Summary**

In the Canadian Arctic, populations of northern-breeding geese (mainly Lesser Snow Geese, *Chen caerulescens caerulescens*, and Ross’ Geese, *Chen rossii*, hereafter called ‘light geese’; *Kangut* and *Kangunnaaq* in Inuktitut) have increased dramatically in the last 50 years according to scientific research. Scientists are studying the impact that geese have on the land and other animals, including shorebirds. Their work to date suggests that light geese have affected vegetation over large areas of the Canadian Arctic, and could negatively impact shorebird populations nesting in areas where geese are abundant. In Nunavut, light geese are harvested by Inuit. Few studies document Inuit knowledge (IK) of goose populations or interactions of geese with the land, water, other animals, and people. Inuit have lived and hunted in the areas of the light goose colonies for a very long time, and are knowledgeable about past and current patterns of goose distribution and population growth or decline over time. Inuit knowledge will help everyone to better understand how light geese are impacting the land, water and other wildlife including shorebirds, and improve the way goose populations are managed today. This report documents knowledge gathered in August 2017 through interviews, group discussions, participatory mapping, and site visits with 21 Coral Harbour residents who were identified by the Project Management Committee.

**Key findings**

Here is what Coral Harbour residents said about light geese:

- **Starting in 1917,** the government tried to stop Inuit from hunting light geese because they said the numbers were too low. Inuit did not listen, as they saw how many geese were nesting.
- **In the past,** people did not eat as many light geese as today. Instead they hunted other animals.
- **Light geese were an important food source** from the time when there were no caribou around (starting in 1967) until there were enough caribou for Salluit to hunt (in the late 1970s).
- **In the past,** light geese and their eggs were stored underground to keep them cool.
- **Light geese are a very important food source today.** Mostly youth hunt them.
- **People described different things about the size of the light goose population** around Coral Harbour, such as (1) the goose population is increasing and there are too many geese, (2) the goose population is increasing but this is fine, (3) the goose population is stable.
- **People described different things about the impacts of light goose droppings** on the land, water, wildlife, and people. Goose droppings are (1) contaminating drinking water out on the land; (2) contaminating the land; (3) helping the land by adding nutrients; and (4) making caribou sick when light goose droppings are on their food.
- **People described different things about how light geese have changed the land.** They mentioned that (1) this is just part of the natural cycle and not a concern; (2) light geese are eating so much that they are changing the vegetation, and (3) geese leave a lot of feathers and droppings.
- **Some people said** that when light geese nest, it affects the land the most. Other people said that when light geese graze, it affects the land the most.
- **People explained** that light geese have recently moved to new areas. Reasons for this include:
  - Climate change is making the land drier than in the past;
  - Like all animals, light geese need to move to new feeding grounds when food runs out;
  - Light geese are avoiding predators such as foxes, and higher numbers of hawks and polar bears;
  - Light geese have changed the land so they move when there is bare soil and nothing to build nests with; and
  - Use of motorized transportation (snowmobiles, all-terrain vehicles) when going out on the land has become very common. The increase in types of transportation, the number of people using them, and how often people are using them has disturbed light geese and caused them to move to new areas.

Here is what Coral Harbour residents said about shorebirds:

- **Shorebird meat, eggs, fat, feathers, and skins were very important in the past.**
- **Today,** people still enjoy seeing and hearing shorebirds, and eating their eggs.
- **Shorebirds can be signs of changing weather, changing seasons, and nearby animals.**
- **People described different things about the size of the shorebird population around Coral Harbour,** such as (1) the number of shorebirds has not changed over time; (2) the number of shorebirds is decreasing; or (3) they are unsure about shorebird numbers.
- **Reasons given about why fewer shorebirds are seen nowadays include:**
  - Shorebirds have moved to new areas to feed (e.g., Red Phalarope);
  - People do not know because no one is hunting them locally, so shorebirds must be dying on their own;
  - In 1988 or 1989, thousands of dead birds, with no wounds, were seen near Coats Island. The elders thought maybe they were struck by lightning;
  - Drier land, lower water levels, and ozone depletion are negatively impacting shorebirds;
  - Shorebirds have been affected by changes in food source (e.g., not enough insects, overgrazed vegetation, lower water level in lakes that have krill and little fish);
  - Shorebirds have been negatively impacted by changes in predators including new birds of prey, a drastic increase in the number of ravens in the 1980s, and more polar bears;
  - Increased human activity and new methods of transportation (e.g., local boats, large ships, all-terrain vehicles) create noise and pollution that impact shorebirds; and
  - Shorebirds are affected by human activity in the South.

**Specific project objectives**

- Documenting IK about light goose populations and their impacts on the land, water, other animals (including other bird species in particular) and people in the Kivalliq region;
- Documenting Inuit-identified strategies for light goose management that address Inuit concerns and perspectives;
- Increasing the capacity of Coral Harbour residents to do IK research on wildlife; and
- Encouraging the combined use of IK and scientific information to provide recommendations for light goose and land management.
Light geese and shorebird management strategies

Here is what Coral Harbour residents said about light geese management strategies that could be implemented in the future:

- Hire local hunters to harvest enough light geese for everyone in Coral Harbour and for communities that do not get many light geese.
- Put a bounty on light geese.
- Hunt light geese commercially and build a local processing plant (i.e., factory for treatment of meat and down).
- Have open sport hunting for light geese.
- Increase the sport hunting daily bag limit and the length of hunting season for non-Inuit in order to encourage people to come to Coral Harbour.
- Develop tourism opportunities such as bird watching and seeing nesting areas.
- Light geese should not be wasted. This is not the Inuit way.

Here is what Coral Harbour residents said about shorebird management strategies that could be implemented in the future:

- More research is needed about the light goose population size outside the Qaqsauqtuq (East Bay) and the Ikattuaq (Harry Gibbons) Migratory Bird Sanctuaries.
- Take no action as people want the light geese to come back next year.

The final step of this project consisted in a workshop held in Winnipeg in September 2018 where IK holders, biologists, and wildlife managers shared their knowledge and developed joint recommendations for the management of light geese in the Kivalliq region, Nunavut.
Background

Light geese and science

In the Canadian Arctic, populations of northern-breeding geese (mainly Lesser Snow Geese, *Chen caerulescens caerulescens*, and Ross' Geese, *Chen rossii*, hereafter called 'light geese'; Kangut and Kangunnaaq in Inuktitut) have increased dramatically in the last 50 years according to scientific research (Figure 1). Scientific studies have shown that populations of light geese are altering their breeding and staging habitat through overgrazing and grubbing. Scientific researchers have described the effects of light geese on tundra vegetation but little is known about how geese might be affecting other animals (Figure 2). For example, many populations of Arctic-breeding shorebirds have declined dramatically over the last decades and biologists are trying to understand if and how light geese may influence declining populations of other Arctic-breeding birds.

![Figure 1](image1.png)

**Figure 1.** Growth in numbers of nesting birds by colony of Lesser Snow Geese, 1973–2008 for Southampton Island (top) and McConnell River area (bottom).1

![Figure 2](image2.png)

**Figure 2.** Potential indirect interactions between geese, other species, and habitat.2

---


Light geese management in the Kivalliq region

In the Kivalliq region of Nunavut, three important Snow and Ross’ Goose colonies are located within Migratory Bird Sanctuaries (MBSs). The Qaqsauqtuuq (East Bay) and the Ikattuaq (Harry Gibbons) MBSs are situated on Southampton Island, near Coral Harbour, and the Kuugaayuk (McConnell River) MBS is located on mainland Kivalliq, near Arviat (Figure 3). Through the Inuit Impact and Benefit Agreements (IIBAs) for National Wildlife Areas and Migratory Bird Sanctuaries in the Nunavut Settlement Area, the Irniurviit ACMC and the Nivialik ACMC advise the Minister of ECCC and other parties on all matters related to the management of these conservation areas. These ACMCs are also currently developing Management Plans for all three sanctuaries.

Light goose abundance and their associated impacts, and management of the light goose population were identified as a key priority for the Irniurviit Area Co-Management Committee (ACMC) in Coral Harbour, Nunavut; the Nivialik ACMC in Arviat, Nunavut; and by Environment and Climate Change Canada (ECCC). The project leading to the production of this report was conceived through discussions between the Irniurviit ACMC and the Aiviit Hunters and Trappers Organization (HTO) in Coral Harbour, the Nivialik ACMC and the Arviat HTO, and their partners at ECCC and Carleton University.

Figure 3. Qaqsauqtuuq (East Bay), Ikattuaq (Harry Gibbons) and Kuugaayuk (McConnell River) Migratory Birds Sanctuaries

---

http://publications.gc.ca/site/eng/317630/publication.html
Light geese and Inuit knowledge

In Nunavut, light geese are harvested by Inuit. Inuit have lived and hunted in the areas of the light geese colonies for a very long time. Inuit knowledge (IK) includes ecological observations about light goose populations and their past and current interactions with the land, other animals (including shorebirds) and people. However, only very few studies have documented IK about light geese or shorebirds in Nunavut.

The ACMCs emphasize the use of IK in the development of management plans for National Wildlife Areas and Migratory Bird Sanctuaries. Through this project, IK about light goose populations and their impacts on the land, water, other animals (including other bird species) and people in the Kivalliq region were documented. Potential strategies for light goose management that address Inuit concerns and perspectives were also identified. IK collected and documented through this project will therefore contribute to the development of Management Plans for the Qaqsauqtuuq (East Bay), Ikattuaq (Harry Gibbons) and Kuugaayuk (McConnell River) MBSs, and will complement ongoing scientific research efforts. Thus, it will contribute to improving the way light geese are managed in the Kivalliq region, Nunavut.

Project objectives

- Documenting IK about light goose populations and their impacts on the land, water, other animals (including other bird species in particular) and people in the Kivalliq region;
- Documenting Inuit-identified strategies for light goose management that address Inuit concerns and perspectives;
- Increasing the capacity of Coral Harbour residents to do IK research on wildlife; and
- Encouraging the combined use of IK and scientific information to provide recommendations for light goose and land management.
Methods

Ethics

This project was conducted under research license 03 015 17N-M from the Nunavut Research Institute. Informed consent was received prior to interviewing project participants, and participants were given the option of remaining anonymous or providing their name and/or photo and/or a brief biography for inclusion in the report (Appendix I – Invitation Letter and Consent Form).

Knowledge documentation

This report documents knowledge gathered through interviews, focus group discussions, and mapping exercises with 21 Coral Harbour community members. In August 2017, Natalie Carter (ECCC) trained Coral Harbour Community Researchers Bobbie Saviakjuk and Lenny Emiktaut to facilitate participatory mapping and conduct interviews and focus groups. They taught Natalie how to do research in Coral Harbour. Together Natalie, Lenny and Bobbie refined the draft questions (developed by Natalie, Vicky Johnston, Paul Smith, Gita Ljubicic, Dominique Henri, and Coral Harbour PMC members), to ask the research participants. (See Appendix II – Interview Questions). Lenny and Bobbie also recruited participants, co-facilitated the mapping exercises and interviews, and organized and participated in site visits on the land, with elders.

Immediately after training and question development were completed, Natalie, Lenny, and Bobbie interviewed 21 Coral Harbour hunters, elders, and community members over a 14-day period. The participants were identified by the PMC as key knowledge holders about Snow and Ross’ Geese and the impacts of Snow and Ross’ geese on the land, water, other animals (including other bird species) and people. Lenny and Bobbie interpreted the discussions. Through mapping, interviews, and site visits local knowledge about light geese and other birds was documented. Posters were used for bird identification during discussions with participants (see Appendix III – Posters used for bird identification purposes during interviews).

Table 1. Activities conducted by the Project Management Committee

<table>
<thead>
<tr>
<th>DATE</th>
<th>TYPE</th>
<th>TOPIC</th>
</tr>
</thead>
<tbody>
<tr>
<td>November 2016</td>
<td>Conference call</td>
<td>Research proposal development</td>
</tr>
<tr>
<td>February 2017</td>
<td>Conference call</td>
<td>Planning May 2017 meeting in Coral Harbour</td>
</tr>
<tr>
<td>May 2017</td>
<td>In-person meetings in Coral Harbour</td>
<td>Study area to map, research questions, community researcher recruitment, timing of data collection</td>
</tr>
<tr>
<td>July 2017</td>
<td>Conference call</td>
<td>Community researcher job interviews</td>
</tr>
<tr>
<td>August 2017</td>
<td>In-person meetings in Coral Harbour</td>
<td>Potential participant lists, research questions; updates during 1 week of training and 2 weeks of data collection</td>
</tr>
<tr>
<td>October 2017</td>
<td>Conference call</td>
<td>Planning December 2017 results sharing and validation meetings in Coral Harbour</td>
</tr>
<tr>
<td>November 2017</td>
<td>In-person meetings in Coral Harbour</td>
<td>Results sharing and validation in Coral Harbour</td>
</tr>
<tr>
<td>December 2017</td>
<td>In-person in Quebec City</td>
<td>Presentation at ArcticChange 2017 conference (community researcher Lenny Emiktaut on behalf of PMC)</td>
</tr>
<tr>
<td>February 2018</td>
<td>Conference call</td>
<td>Planning April 2018 results sharing in Coral Harbour</td>
</tr>
<tr>
<td>April 2018</td>
<td>In-person meetings in Coral Harbour</td>
<td>Results sharing and refinement of management recommendations</td>
</tr>
</tbody>
</table>

Project guidance

All stages of the study were done under the guidance of the Project Management Committee (PMC). PMC members include Aiviit HTO and Irniurviit ACMC members as well as ECCC staff. PMC guidance included but was not limited to the activities described in the table below (Table 1).

Analysis

One week of training in Ottawa had been planned for Lenny and Bobbie in November 2017. The goal of this training was learning how to work with the maps and typed versions of the audio recordings to analyze and summarize the important places and key points that everyone talked about. Unfortunately, due to two blizzards, Lenny and Bobbie were unable to attend this training. However, Lenny transcribed the audio recordings then Natalie conducted thematic analysis and wrote a draft community report and a 3-page summary of key findings. Vicky, Paul, and Gita reviewed the draft reports. Lenny then validated and edited the draft community report and summary then Natalie and Lenny discussed changes by phone and in-person. This pre-validation process was repeated until a final draft version of reports was ready for validation in Coral Harbour. The summary was translated into Inuktitut and reviewed line-by-line by the PMC and Coral Harbour community members in December 2017, with support from Vicky and Natalie. Natalie edited the full report and summary accordingly, with input from Vicky and Dominique. Dominique edited and formatted the final community report, and Paul and Gita reviewed it. This report was translated by Suzie Napayok-Short.

Maps were digitized by Bhavana Chaudhary (ECCC) and grouped by time (decades) and light geese concentration (high, medium, low) following discussions with community researchers, Dominique, Paul, Gita and Natalie. The draft maps were validated during the December 2017 meeting, and edited accordingly.
Results

Participants shared their diverse knowledge and perspectives about light geese, shorebirds, and other birds. Participants also described potential strategies for managing light geese, shorebirds, and other birds. Their knowledge is presented in the sections that follow. Inuit knowledge about light geese and related management strategies is presented first, followed by Inuit knowledge and related management strategies about shorebirds and other birds. Appendix IV also describes bird species seen around Coral Harbour, and Appendix V includes maps of light geese distribution and concentration over time according to Inuit knowledge.

Inuit knowledge about light geese

Inuit knowledge about light geese included past and current cultural significance of light geese; the size of the light goose population; impacts of light geese on the land, water, animals, and people; and reasons why light geese have moved to new areas (factors driving changes in light goose abundance and distribution). Participants also described potential strategies for managing light geese.
Harvesting ban

- The government tried to stop Inuit from hunting light geese because they said goose numbers were too low. Inuit did not listen because they could see how many geese there were in their nesting areas. (Note: In 1917, with the passage of the Migratory Birds Convention Act, and “all the reports about the demise of wildlife in the Arctic”, the Northwest Game Act (NGA) was passed into law in Canada. Under the NGA and even legislation passed as recently as 1949, Inuit were prohibited from hunting geese and taking eggs unless they were “actually in need of such game or eggs to prevent starvation” and were “subject to the seasonal restrictions on hunting geese”. The Nunavut Land Claims Agreement (1993) and the revised Migratory Birds Convention Act (1994) assured Inuit of their right to harvest migratory birds and their eggs for domestic purposes.)

Eggs

- A lot of people went by dog team or walked to certain areas to pick eggs. Inuit stored both meat and eggs underground to keep them cool.

Meat

- Inuit did not eat as many light geese back then. Inuit hunted seals and other animals more.
- Light geese were very important when the caribou were absolutely gone for awhile (around 1967) and until there were enough caribou for Sallirmiut to hunt (late 1970s).
- Inuit were really happy to have some thing new to eat other than sea mammals, and light geese were a main food source.

Other uses

- Light goose wings were used as a broom or for dusting. Pointed ends are good in corners.
- The fur was used for cleaning because there were not any tea towels or dish cloths.
- Dried bird head skin made a blanket for dolls, or were toy versions of the caribou skins used as softener for sitting on sleds (awvanguaq).
Current cultural significance of light geese

Harvesting ban
- “It is very good that we do not have to wait until the fall to hunt geese anymore” [i.e., that the restrictions on Inuit harvesting light geese and their eggs no longer exists].

Meat
- “Light geese are still very important today. They feed homes. They are healthy. They provide variety – not just from the sea. We try to have enough in the community freezer for the year”.
- There are a lot more geese in the community freezer today than in the 1980s and 1990s.
- A lot of people, especially younger guys, hunt light geese today because people can afford ammunition versus in the past. It is partly for sport and partly for food.
- “Since our ancestors to today, geese have always been important. They are one of the best meats”.
- “Given our sky-high food prices when someone can get and be given food for free it is welcome, a blessing. It’s beautiful”!
- Light geese are eating in a different tundra than in the past. Today the snow melts right away, compared to in the past when the snow melted later and more slowly. Light geese meat is changing because their food source is changing. Light geese fat is more like caribou fat – oilier than it used to be. The meat is harder.
- “There has been a shift in our diet in the community since the population of the caribou increased. Community annual consumption of geese may be at the same level it was at 20 years ago, even though the population of the community has increased”.

Photo credit: Natalie Carter
Current cultural significance of light geese

**Eggs**

- “If people did not try to get eggs, imagine how many geese there would be! Today people harvest 200-300 per day. Back then it would take several days to harvest not even that many”.
- “It is easier to pick eggs now since you only have to travel for 3 hours and you can take little kids even. When more family members can go it is healing being around your kind of people, and the teamwork of collecting eggs really puts everyone together. It costs less money for gas and grub so you save lots of money now that the light geese eggs are near town”.

**Other uses**

- Light goose wings are still used today as a broom or for dusting.
Light goose population size

Population is increasing and there are too many geese

- There are too many light geese now. If there were less of them, they and the land would be healthier.
- They are a little overpopulated. The number could be decreased a bit.
- “I think there should be less of both Ross’ Geese and Snow Geese so we will have them around in years to come. If they over graze all the land, and have limited food, they will move somewhere else to graze and it will be harder for us to get our year’s supply. If there were less geese, the feeding ground would last better”.
- Snow Geese numbers are not too high, but Ross’ Geese have really grown in numbers and there are too many. They are taking over the Snow Goose. They invade Snow Goose nesting areas and then seem to disappear somewhere with their goslings.
- “I worry that if light geese become overpopulated, a lot would start dying off due to starvation”.

Population is increasing but this is fine

- The number of light geese is fine.
- The more light geese the better.
- “The number of Ross’ Geese seems to be getting higher but that does not bother me. In the mid-2000s it was a conversation piece if someone caught a Ross’ Goose but now it is just normal”.
- The population of light geese is fine, because every year is different.

Population has not changed

- “The population never seems to decrease or increase. I have no concerns”.

Other perspectives on light geese population size

- Light geese have made life a lot easier. They are closer to town. They are easier to shoot at because there are more of them. The positive impacts for people are: easy access and they are more abundant. It really benefits people to hunt them.
- This is an opportunity for people to take southern hunters out and start geese hunting outfitting businesses. At least one has started in town already, and it would be great if other people would start them too. It has the potential to help people financially.
- Light geese are not disrupting anything. They are really close to town so we are disturbing them (e.g., kids throw rocks at them).
- “I like seeing them in the morning and on day trips”.

Photo credit: Joshua J. White
Light geese impacts on the land and vegetation

“Snow geese are really affecting the land! They have been eating a lot! And their droppings and feathers. In summer time they affect the land the most. They eat blue, red and black berries. Not even one berry can be found on that bush! We do not have apples and oranges and fruits growing here. They are our only fruits! Land and not store-bought. We love berries so much”.

Geese are impacting the land by grazing and nesting

- If parts of the land were not covered by light geese, the land would be healthier and greener.
- The light geese ate themselves out of house and home at the East Bay bird sanctuary. It is just bare soil and no moss or lichen to build a nest with.
- Nesting, not grazing, has impacted the land the most. Geese mound moss and lichen for nests and compact it into the size of a basketball.
- Light geese cause the most change to the land by overgrazing the land or using the land to make nests. During the summer is when they change the land noticeably; when they are feeding off it with their goslings. They cannot fly so they walk all over the place, and their goslings are with them and can’t fly so they eat a lot of whatever they come across in the same place.

- “We will not know if the vegetation will grow back until later. We have only known the birds at East Bay all our lives and what they have done there. We do not know where they were before then. Maybe they were near the community. But we do not know. Research is needed. We need to see in 5 years what it looks like because Arctic plants take a long time to grow. I thought it would be a lot worse at East Bay than what I saw on the site visits in August 2017. I think anyone who answers that would not be factual. Because it has only been several years since they have been here so the recovery part at East Bay is really hard to say without having some doubt. Harry Gibbons is healthy. It might be a different environment altogether with the rivers there. 100 years ago were they here? And they went back here 50-60 years ago? It is hard to say. But it is a good theory”.

- “I do not know if overgazing and moving is part of a long cycle (e.g., 50 to 60 or 200 years) that has happened before or if there are too many light geese”.

- “A biologist showed me around 2010 how the light geese dig, turn over the plants and expose the bare soil. I had not noticed it until then, until he showed me. Now I have seen it in other places”.

Light geese are eating berries

- Due to the high numbers of light geese, the berries are being eaten and people cannot pick many berries because the geese get there before them and before the berries are ripe.
- “We love geese when they arrive in spring but at fall time we do not like them because they eat blueberries. They become our annoying enemies. Berries are our only fruits on the land”.

Photo credit: Robert Rockwell
Light geese impacts on the land, water, wildlife, and people

Light geese droppings are fertilizing the land

- “There is a process in which the land needs replenishing and replenishes itself. The birds are helping the land with their droppings by adding nutrients and fertilizer over time. Waste is used as fertilizer down South. It is the same idea over time. Short-term damage but long-term benefit. Like forest fires. We do not like to see forest fires but look how they help organisms. It is the same idea in the Arctic. Research is needed about this”.
- “Where geese land every year, the soil is rich. But if they skip a place it becomes spoiled. They plant some good nutrients from the South after eating so well there, keep the land warm, and add droppings. If they don’t come back that area dies off because there are no nutrients”.

Other comments

- “It is just a life cycle and how the system works with the land, climate, weather, freezing, and melting. It is all natural so I cannot answer if the geese are changing the land”.

- Other areas on the land are also being affected but not as quickly as the light geese areas.
- “The land is changing even in areas where there are no geese. Permafrost melting, climate change. Exactly the same way as where there are geese. Slowly but surely some of the land is coming back [vegetation is slowly regrowing]. Not all of it, just some where the soil is healthier which depends on permafrost”.
- “It is a bit scary that geese eat GMO [genetically modified] corn, and all that crap which then gets into our ecosystem”.

Light geese impacts on water

- “We wash with water from ponds and lakes but we do not drink the water that is not coming from a river anymore. It is dangerous due to there being so many birds, all kinds, out there, and there is E.coli. We bring water from town to drink”.

Light geese interactions with other animals

- The number of shorebirds is too low. They have been affected by the numbers of light geese.
- Light geese are contaminating the land and leaving droppings all over the place. They leave droppings on caribou food and then the caribou eat it. Last year a lot of caribou were sick.
- “Caribou and shorebirds do not eat the same food as light geese so I do not think they are having an impact on light geese. I have seen them together just minding their own area”.
- Light geese pluck for nests what caribou eat (lichen and moss).
- Foxes are found in the same place every year. Each year the geese go to a new place and the foxes follow. When there are more geese there are more foxes.
- There are more hawks around than before 2002. There are also more Snowy Owls.
Why light geese have moved to new areas

Light geese have moved due to climate change
- The main reasons light geese have moved to new areas are climate change, permafrost melting, decaying because of the permafrost melt, and the geese eating the land.
- The climate is definitely changing. Especially this 21st century it is really going fast. A lot of the change happens in July and August. It is warming up quicker, snow is melting faster, and the sea ice is changing a lot and freezes later.
- The land is becoming too dry.
- Snow geese used to be a main source of food. Back then people waited for them to come by but now with climate change people can go anywhere and get them.

Light geese have moved to find food
- All animals move to new areas when they run out of food. Then when the land grows back the animals return.
- If there are too many geese and the vegetation is getting scarce they will start dying off from starvation.
- “Each year is different. Some years light geese are closer to town, other years closer to the mountains. I am not sure why but where we were yesterday by Qinghua the land seemed dead. It was different. I was shocked. It was lush green grass when I was growing up”.
- “We started noticing that in the early 1990s they were relocating from their area from the past. Vegetation there started dying. A lot of foxes and falcons are there”.

“The light geese have no choice but to move to new areas. They have to move to new feeding grounds. [There are so many of them in one place that if they stay] it is like wearing a dirty sock for a week”.
- “60% of Southampton Island is granular material and there are only certain areas geese can really forage, gorge, and feed. They can not feed on gravel. I think there are just a lot of places they can go and certain places where they can not go”.

Presence of predators
- When light geese arrive in spring there are foxes already where they might want to settle. If they feel there are too many foxes they will move to a new area so they will not be disturbed.

Human activity
- There are more snowmobiles these days versus in the 1980s and 1990s. The number of people using them, and how often people are using them has disturbed the light geese and caused them to move to new areas.
- Geese are not scared of people anymore, like they used to be. Then even come right into town to eat the good grass around our houses and in the baseball field.
Potential strategies for managing the light goose population

Expand the local harvest
- “Do not just hunt light geese and waste them. We Inuit do not hunt when we are not going to eat something. Just give them to someone.” In Inuktitut, there is not even a word for “over harvest” (because Inuit Qaujimajatuqangit (Inuit traditional knowledge) teaches us to harvest only what we need, and to waste nothing).
- Hire local hunters to harvest enough for everyone in the community, and for other communities that do not get as many light geese as Coral Harbour does. Geese could be given to the HTOs in other communities. The community already sends geese to other settlements when people ask for them.
- Put a bounty on light geese.
- Hunt light geese commercially and have a processing plant (meat factory) to prepare them. The whole of Nunavut could be fed with wings, breasts, etc. It would help a lot through employment.
- Pluck the down (fine, medium, feather) and use it commercially, including for clothing.

Expand sport hunting opportunities
- Clients from the South should come and hunt light geese. Have open sport hunting for Snow and Ross’ Geese. There would be guide jobs and outfitting businesses (employment income). At least one waterfowl hunting outfitting business already exists in Coral Harbour.
- The bag limit should be increased for southern hunters so they are encouraged to come here. The geese they shoot would be shared with the community, and the rest would be processed commercially because Coral Harbour people can only eat so many geese.

Conduct research in new geographic areas
- More research is needed. Studies about the size of the light geese population outside the sanctuaries are needed.
- More studies on the shore and at Ikattuaq should be done, because Ikattuaq is not overgrazed. It is greener than Qaqsauqtuq now but the amount of vegetation at Ikattuaq is also decreasing. Ikattuaq is almost getting to be overgrazed too. Before it is overgrazed, researchers should concentrate there.

Develop tourism opportunities
- Tourism opportunities could be developed, such as bird watching for people who want to see the end of the light geese migration route.

Other strategies
- “Do not increase the size of the light goose harvest because the more we hunt light geese, the more their numbers will increase. The more light goose eggs we pick, they are just replaced by the next day. It is just like in the past in Salliq when there were very few mussels. A knowledgeable woman) said to pick the mussels and that eventually the number of mussels would grow; and the numbers grew”.

Other comments
- It is disrespectful when kids throw rocks at geese and when vehicles do not slow down on the road and hit and kill the geese. Public announcements about this are needed so people stop doing those things.
Inuit knowledge about shorebirds and other birds

Inuit knowledge about shorebirds and other birds included past and current cultural significance of shorebirds and other birds; the population size of shorebirds and other birds; and reasons why the shorebird and other bird population size has changed (factors driving changes in shorebird/other bird abundance and distribution). Participants also described potential strategies for managing shorebirds and other birds.
Past cultural significance of shorebirds and other birds

Eggs and meat

- Shorebirds were an importance source of food and provided good meat for families. They will always be important for hunters. Especially in the fall they were nice and fat and were hunted.
- Shorebirds were easy to catch in spring, and hard to hunt. If hunters could not find bigger animals or were tired of eating the same animals, shorebirds were something different to eat.
- “The Sijjariaq (sandpipers) was delicious, and a good source of food. Really good for breakfast. We only ate bigger birds for breakfast. As a child if you came with a small bird the leaders of the group would make you eat it to scare you and teach you that everything alive is important and cannot be wasted”.
- “We were always told never to hunt the smaller birds because they feed on bugs and worms. So if the little birds went extinct nothing would take care of the bugs and worms on the land”.

- People ate boiled American Golden Plovers and roasted or boiled (not raw) loons, owls, Snow Geese, Cackling Geese (referred to locally as Canada Geese; Nirlinnait), swans, Ross’ Geese, cranes, and Black Guillemots.
- The fat in shorebirds was used too.
- Eider Ducks were the main diet, not light geese.

Interesting and beautiful to see and hear

- “As kids, seeing shorebirds made the land more fun to travel as they were something to see during long travels. I wish to see more of them since there are less to see these days”.
- “Shorebirds were beautiful to watch and made beautiful sounds. As a kid it was music to my ears when I was going to bed at camp”.

People ate boiled American Golden Plovers and roasted or boiled (not raw) loons, owls, Snow Geese, Cackling Geese (referred to locally as Canada Geese; Nirlinnait), swans, Ross’ Geese, cranes, and Black Guillemots.
Eggs and meat

- “Shorebirds are still very important today. They would make a big difference if I was lost or my vehicle broke down and I did not have enough food. I could survive eating them”.
- “Shorebirds are still important today. Some people still hunt them. We crave meat we have not had in a long time. People used to walk long distances to get to shorebirds and their eggs. Now it is not as much of a struggle to get to them”.
- People do not eat shorebirds today but some people pick their eggs.
- “In the past we were not allowed to kill them when we were not going to eat them. That was our rules. When someone killed a small bird we had to cook them and eat them. Even the heart. That’s why I think it even helps us up to today. Today the younger generation do not seem to care. They are just on their hand-held devices and do not even come out to the land, and are not learning those rules about how to treat wildlife respectfully”.

Interestings and beautiful to see and hear

- “Shorebirds are still important today. It is a joy to see them! People do not think of them anymore. The young generation has no knowledge of them, so they are not too noticed”.
- “Every time when we see those shorebirds it makes us happier. It is always good just to see them”.
- “I enjoy looking at and listening to shorebirds when I am camping and sleeping. Hearing an Arctic Loon is so peaceful for me”.

Indicators of environmental health

- Shorebirds are a good indicator of environmental health; their presence shows the food chain is still good. They are cute, they are a sign that spring has arrived or is just around the corner, and that we can hunt certain animals in this season.
- “When we see the Arctic Terns and other birds around the shore it is a sign that the shores are still alive and that there is still life. We fear accidental oil spills from ships travelling up north, so each time we still get to see those shorebirds it is like saying there is still life at the shore”.

Today King Eider and Common Eider eggs eggs are still important food sources.

Today some people collect eiders, Thick-billed Murre, and Black Guillemot eggs. People in their 60s and older eat Common Loon, Pacific Loon and Red-Throated Loon eggs.
Shorebird and other bird populations are declining which is concerning

- “Shorebirds are not showing up like they used to. They are not hunted too much by anyone but they are important to us Inuit. Because they are fun to see, they are beautiful and just a wonderful thing to see. There are not too many like they used to be anymore, but all animals bounce back from near extinction. I feel that the numbers are too low for the shorebirds today and it is worrisome”.
- The numbers of shorebird are too low. They have been affected by the numbers of light geese.
- “I would love to see higher numbers of shorebirds back on our island because they used to be so joyful to see”.
- “I would love to see more of the shorebirds back to where they used to be in numbers, but they are taking a long time to recover”.
- Shorebirds are less visible around the town area. In the past, they were more visible. The number of shorebirds is fine, just that Phalarope and Tern numbers are low.
- Shorebirds are not seen in groups anymore.

- “I do not really pay attention to shorebirds except I try to notice the Red Phalaropes. The elders are concerned about how the numbers have fallen even though they are not a source of food – just to see them. Us Inuit we respect all animals even if we do not eat them. We love to see them around. It is good to see them around. They keep the number of mosquitoes and black flies down. People even announce on radio when they see one”.
- “We started noticing there were fewer Brant Geese about 17 years ago. They used to come in the one hundred thousands. This year I have not seen even one. They are very shy of people. A person might have to go 50 miles outside of town to see them”.
- Shorebirds travel a lot to where their main diet is so they are constantly moving to feed so it is hard to know the population size has changed or not.
- “As an adult I do not see them around as much as when I was a kid. But I also do not walk around as much as I used to. Instead I do a lot of riding around”.
- Back then people went out on the land more often. People may say they do not see those birds anymore but it is really that people are not out as much to see them, but the birds are there.

Raven population is increasing which is a concern

- “I have a concern about ravens. I know they clean out old carcasses, but one time the water reservoir was contaminated with raven waste because a couple were nesting over there. Ravens are an annoyance and take foxes from our traps”.

Owl and falcon population is increasing

- The number of owls goes up and down and it is not consistent. If there are more lemmings around there will be a lot of owls. Owl numbers are slowly going up today. They dropped before but are now recovering.
- The number of Peregrine Falcons has increased since the 1990s.

Unsure if shorebird population size has changed

- Shorebirds travel a lot to where their main diet is so they are constantly moving to feed so it is hard to know the population size has changed or not.
- “As an adult I do not see them around as much as when I was a kid. But I also do not walk around as much as I used to. Instead I do a lot of riding around”.
- The number of Peregrine Falcons has increased since the 1990s.
Why shorebird and other bird population size has changed

Global warming
- “Global warming and ozone depletion may be causing the shorebird population to decrease. People are getting sunburned these days so what is it doing to the birds”?
- “The weather is really changing. The snow melts right away these days, before the rivers do, so maybe there are less nutrients around”.
- “Global warming and melting permafrost are resulting in lower water levels. We see bare rocks where lakes used to be. This has a big impact on shorebirds”.

Food availability
- The number of shorebirds may be decreasing because there are not enough bugs for them to eat.
- “Light geese and shorebirds have moved closer to town because of vegetation overgrazing. It is quite weird to see them nest so close to town”.
- The Arctic Tern population is decreasing. Something is impacting where they nest. Maybe it is because the lake water level is dropping. The lakes have krill and little fish.
- Red Phalaropes must have moved to a new area to feed, so Coral Harbour people do not see them anymore.
Presence of predators

• The number of shorebirds may be decreasing because there are too many predators passing by.

Other birds

• There are a lot more of shorebird predators today such as gulls, jaegers, falcons, hawks, and ravens.
  – The number of Peregrine Falcons and ravens has increased since the 1990s and they outnumber many shorebirds;
  – Gulls are the #1 predator of shorebirds. They seem to do it as a team;
  – Jaegers chase shorebirds;
  – Falcons eat eider ducks;
  – “Ravens prey on other birds – and follow light geese around. You would have been lucky to see one raven from the 1960s to 1980s. Today there are a lot more ravens and they are all over Southampton Island”; and
  – Hawks scare shorebirds off an area.

Foxes

• Fewer Tundra Swans are seen. Perhaps they have moved somewhere where they are fewer predators (foxes and people).
• Foxes have a 4-year population cycle (rise and fall). They are not trapped as much anymore since the price of fur is down, so maybe the number of foxes has increased. There are lots of lemmings which has attracted more foxes which eat shorebirds’ eggs.
• “Yes, foxes are predators of shorebirds, but foxes need to eat too”.

Polar bears

• There are a lot more polar bears roaming around and feeding on eggs. Maybe that is why the eider ducks moved to a new area closer to town.
Shorebird interactions with other animals

Light geese

- The numbers of shorebirds is too low. They have been affected by the numbers of light geese.
- “Red Phalaropes were in the same areas where people were picking light geese eggs. Light geese are taking over some birds’ areas such as Red Phalaropes. I wonder if the Red Phalaropes have been sick and dying and that is why we see less of them? Light geese eat the same food as Red Phalaropes so the Red Phalarope numbers have decreased”.
- Snow Geese eat the same food that shorebirds eat, so shorebird numbers are increasing slower than light geese numbers. (Note: Scientists report that shorebirds eat insect-like organisms found in the soil (arthropods), and that light geese eat grass.)

Caribou

- “The caribou get fat later than they used to in the areas around the island. They eat the same grass, lichen, leaves, and sometimes seaweed [as shorebirds]”.

Human activity around Coral Harbour

- Shorebirds might have moved away from ships and the gas smell or from any kind of boats. Thirty miles outside of town we see shorebirds, but not close to the town.
- Sometimes when fox hunting, a Snowy Owl would be caught in the trap and would be eaten by people. Now, fewer Snowy Owl are close to town.

Human activity in the South

- Shorebirds are disappearing because down south shorebirds have nowhere to land on beaches during migration because the beaches are full of people sunbathing. So a major factor is that they are getting exhausted on the way north. Coral Harbour people read about that.
- “Firefighters spray that red stuff to put out forest fires. It puts the fire out but it is very dangerous to animals”.

Shorebird numbers really decreased after the oil spill down South about 10 years ago (i.e., Deepwater Horizon, Gulf of Mexico, 2010).

Causes of shorebird and other bird declines are unknown

- The reason the numbers are decreasing is unknown. “Nobody [here] is hunting them. They are dying on their own”.
- In 1988 or 1989 there were thousands and thousands of dead birds of all kinds in the water near Coats Island (mainly Thick-billed Murre, Black Guillemot, Common Eider, Hudsonian Godwit and King Eider). They had no wounds. The elders thought maybe they were struck by lightning. There were so many dead birds they could not be cleaned up.

In early spring of 2011 or 2012 in South Bay when there were still ice pans there was a line of oil that we followed in the water for 30 minutes and we passed two or three dead eider ducks”. (Note: Coral Harbour PMC members felt this was oil that is naturally found in the bay – not from a spill or human source.)

Why shorebird and other bird population size has changed
Potential strategies for managing shorebirds and other birds

Communicate with people in the South about the importance of shorebirds and other birds

- If shorebirds are being hunted out down South then something should be done about that. It would be good to make a Youtube video describing how they are so important to people in the North so that people in other places and of other cultures can understand how the loss of shorebirds affects people in the North.

Create migratory resting places

- Reserve beaches in the South for shorebirds to rest on during migration.

Manage boat and ship traffic

- “The question of how to protect shorebirds is very hard to answer because everyone is going to go boating and we cannot stop ships. I think even shorebirds’ food might be polluted too. Only government big people can change that – the ship and boat traffic. It would be hard to change boat or ship traffic because Sallirmiut are going to continue boating and Sallirmiut cannot stop ships. Only the government can make those changes”.

Let nature do its job

- “We cannot tell birds to come here or go away so there is no way to fix the problem. There is no solution. It is all in nature. We cannot control nature and cannot do anything about what is happening naturally. As it is a natural cause that the numbers are lower today, we as humans can only hope that they will bounce back in numbers from being too low”.

Conduct research

- The Arctic Tern population is decreasing. Something is impacting where they nest. Maybe it is because the lake water level is dropping. Snapshots of the current water level are needed as baselines. Then we can maybe figure out why shorebirds are disappearing. And it might lead us to know which areas to protect, conserve, or keep people out of.

- “It is like the low caribou numbers. There is not much we can do unless nature does its job”.

- “The number of shorebirds is fine as long as they never go extinct. We cannot help them to survive, although we can help thin owls become fatter by feeding them fish”.

Stop ships. I think even shorebirds’ food might be polluted too. Only government big people can change that – the ship and boat traffic. It would be hard to change boat or ship traffic because Sallirmiut are going to continue boating and Sallirmiut cannot stop ships. Only the government can make those changes”.

Let nature do its job

- “We cannot tell birds to come here or go away so there is no way to fix the problem. There is no solution. It is all in nature. We cannot control nature and cannot do anything about what is happening naturally. As it is a natural cause that the numbers are lower today, we as humans can only hope that they will bounce back in numbers from being too low”.

Conduct research

- The Arctic Tern population is decreasing. Something is impacting where they nest. Maybe it is because the lake water level is dropping. Snapshots of the current water level are needed as baselines. Then we can maybe figure out why shorebirds are disappearing. And it might lead us to know which areas to protect, conserve, or keep people out of.
Conclusion

Through this project, Inuit knowledge (IK) about light goose populations and their impacts on the land, water, other animals (including other bird species), and people in the Kivalliq region were documented. Inuit-identified strategies for management of light geese, shorebirds, and other birds that address Inuit concerns and perspectives were also identified.

The diversity of perspectives documented here may be explained by the diversity in knowledge holders who participated. For instance, participants ranged in age (young hunters, adults, elders) and each was unique with regard to the number of years of experience they had had on the land, and the depth and breadth of oral history and Inuit Qaujimajatuqangit (Inuit traditional knowledge) they had acquired in their lifetime. Also, both men and women were interviewed. Thus participants’ roles and responsibilities at given times and in given places differed, which was reflected in the perspectives that they shared. The geographic areas of expertise of participants, and participants’ personal experiences in these areas were also diverse. Given that not every resident of Coral Harbour was involved in this study it is very possible that other residents have additional knowledge and perspectives to share.

Inuit knowledge is always growing and evolving based on individual lived experiences and oral histories passed on between generations. Similarly, this document is meant to be a living (or evolving) document. We hope that it can be used by community members, scientists and wildlife managers as a tool for learning from IQ, generating discussions and guiding future research and decision-making about light goose populations and their impacts on the land, water, other animals, and people in the Kivalliq region.
Dear ______________________

You are invited to participate in a research project called, *Inuit knowledge (IK) about the impact of Snow and Ross’ Geese abundance on land, wildlife, and people, and recommendations for goose management in the Kivalliq region, Nunavut*. The project is being conducted by the Irniurviik Area Co-Management Committee, the Aiviit Hunters and Trappers Organization, and Environment and Climate Change Canada. The project is funded by the Nunavut Wildlife Management Board, the Nunavut General Monitoring Program, Polar Knowledge Canada and Environment and Climate Change Canada.

The purpose of the project is to document Inuit knowledge about Snow and Ross’ Geese populations in the Coral Harbour region, particularly the impact of Snow and Ross’ Geese on the land, water, other animals, shorebirds, and people, and to develop Inuit knowledge-derived management recommendations for light geese.

**Procedures**

To fully participate in the interview, you will need to provide approximately 4 hours of your time. The discussion will be audio recorded, videotaped, photographed, and notes will be taken. We will be meeting at Nunavut Arctic College on________________________ from______________________. You will be compensated in the amount of $150 for your participation in the group discussions. Light refreshments will be provided.

Information and opinions that you share will be included in the results of this project and will be shared publicly in the form of reports, publications, or related project outputs (e.g. maps, posters, presentations, news items, website postings on the internet). In addition, original audio, video, photo, transcript, and/or map recordings will be stored and publicly accessible for future use in this community for heritage or education purposes, and/or in future research projects affiliated with project team members.

**Contact information**

If you have any questions or concerns about this project, or the consent you have provided, please contact Natalie, the local project leaders or Nunavut Research Institute.

Dr. Natalie Carter  
National Wildlife Research Centre,  
Environment and Climate Change Canada,  
1125 Colonel By Drive, Ottawa, ON, K1S 5B6  
Phone: 226-820-0771  
Email: natalieacarter001@gmail.com

Moses Nakoolak  
Chair, Aiviit HTO  
P.O. Box 108  
925-8622

Mosha Cote  
Manager, Research Liaison  
Nunavut Research Institute  
P.O. Box 1720  
Iqaluit, Nunavut  
Phone: 867-979-7279 or 867-979-7280  
Email: moshacote@arcticcollege.ca

Noah Kadlak  
Chair, Irniurviit ACMC  
925-8582
CONSENT FORM

Inuit knowledge (IK) about the impact of light geese abundance on land, wildlife, and people, and recommendations for light geese management in the Kivalliq region, Nunavut

I have received the invitation/information letter that goes along with this consent form. I have been fully informed of the objectives of the project being conducted. I understand these objectives and consent to being interviewed for the project. I understand the interview will be audio-taped and video-taped and that photographs will be taken. I understand that steps will be undertaken to ensure that this interview will remain confidential unless I consent to being identified. I also understand that, if I wish to withdraw from the study, I may do so without any repercussions.

I have been informed of what it means to participate in this project. I am willing to participate in the interview in support of this project.

I understand I have been given the option to have my name included in a list of participants who contribute to the maps and discussions. I would like my name used as follows:

☐ I want my name included in a list of participants who contributed to the interviews.

☐ I DO NOT want my name included in a list of participants who contributed to the interviews.

And:

☐ I want to provide a brief personal biography to the research team and I give permission for it to be included in any reports and publications related to this project.

☐ I DO NOT want to provide a brief personal biography to the research team.

And:

☐ I want to provide a photograph of myself to the research team and I give permission for it to be included in any reports and publications related to this project.

☐ I DO NOT want to provide a photograph of myself to the research team.

Participant Consent: ______________________________ (print name)

______________________________ (sign name)

Verbal consent, check here: ☐

Date(s) of consent: ______________________

Witness signature: ______________________
INTERVIEW QUESTIONS

Importance of geese and where they are
1. We want to talk about Snow Geese and Ross’ Geese. This poster was made in Coral Harbour.
2. We want to talk about things like where you see these two kinds of geese, and any changes you have realized about each of them. So should we talk about Snow Geese separately from Ross’ Geese or should we talk about them together? Why?
3. When Inuit were living on the land or when you were growing up what was the importance of Snow Geese? (traditional and cultural significance)
4. What about today?
5. Where do you usually see Snow Geese these days? (map)
6. For each number on the map (repeat it), for each circle
   a. When are Snow Geese there?
   b. What are they doing?
   c. Why do you think Snow Geese are there? (Is there anything about what the land is like there that is the reason they go there?)
7. Where are the places with the highest concentration of geese today? Medium? Lowest? (map)
8. Do you think that the location where Snow Geese are found has changed?
   a. Where did they used to be? (map)
   b. Which are the areas that had the highest concentration of geese back then? Medium? Lowest?
   c. When did they change location?
   d. Why do you think the Snow Geese changed location?
9. Have you realized any changes about Snow Geese compared to in the past? (For facilitator: what, where, when, why)
   a. How many Snow geese there are
   b. Other kinds of geese, gulls, foxes, jaegers, wolverines, grizzly bears, polar bears, insects, caribou, others
   c. Behavior
   d. Health
   e. Size of the geese
   f. Fatter or thinner
   g. Finding groups of dead geese
   h. Other

Shorebirds
10. Do you see shorebirds these days? Which ones? This poster was made in Coral Harbour.
11. Where do you usually see shorebirds these days? (map)
12. When are shorebirds in those places and what are they doing?
13. Why do you think shorebirds are there? What is it about that environment that they like?
14. Do you think that the location where shorebirds are found has changed?
   a. Where did they used to be? (map)
   b. When did they change location?
   c. Why do you think the shorebirds changed location?
15. Have you realized any changes about shorebirds compared to in the past? (For facilitator: what, where, when, why)
   a. How many shorebirds there are
   b. Other kinds of geese, gulls, foxes, jaegers, wolverines, grizzly bears, polar bears, insects, caribou, others
   c. Behavior
   d. Health
   e. Size
   f. Fatter or thinner
   g. Finding groups of dead shorebirds
   h. Other

16. When you were growing up what was the importance of shorebirds? What about today?

**Change in number of geese and shorebirds**

17. Use graph with geese and each shorebird type for each location on the map.
18. Why do you think the number of geese changed at that time?
19. Why do you think the number of shorebirds changed at that time?

**Change in geese habitat**

20. Do you think geese are causing any changes to the land? If so, what changes? (pulling out grasses, a lot of bird droppings)
21. What time of year do you think the geese change the land the most?
22. When did the geese start changing the land? Around what year?
23. Once the geese have changed the land, do they move to new areas (abandon that place) or do they stay there?
24. What was the land like in those places before there were a lot of geese there?
25. Once the geese move are any places going back to the way they used to be?
   a. If yes, please tell me more about that. (map)
   b. Why are those places going back to the way they used to be?
   c. When did they start going back to the way they used to be?
26. In areas with less geese do you see these changes happening? If yes, please describe them. If no, why do you think that is?
27. Are the same changes happening where there are no geese?

**Impact of geese on people**

28. What do these changes mean for Inuit?

**Concerns, benefits, management**

29. Do you think there should be more snow geese, less snow geese, or that things are fine the way they are? Why?
30. Are there good things about the number of Snow Geese around today? If yes, what are they?
31. Are there bad things about the number of Snow Geese around today? If yes, what are they?
32. What do you think should or could be done about the geese?
33. Do you think there should be more shore birds, less shorebirds, or that things are fine the way they are? Why?
34. Are there good things about the number of shorebirds around today? If yes, what are they?
35. Are there bad things about the number of shorebirds around today? If yes, what are they?
36. What do you think should or could be done about the shorebirds?
37. Is there anything else you want to tell us about geese or shorebirds that we have not asked about?
Appendix III – Posters used for bird identification purposes during interviews
### Appendix IV

#### BIRDS OF CORAL HARBOUR

<table>
<thead>
<tr>
<th>English name</th>
<th>Inuktitut name(s)</th>
<th>Has this bird been seen in the Coral Harbour area? Here is what people said.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snow Goose</td>
<td>Kangut</td>
<td>Yes.</td>
</tr>
<tr>
<td>Snow Goose Blue Phase</td>
<td>Kangut</td>
<td>Yes.</td>
</tr>
<tr>
<td>Ross’ Goose</td>
<td>Kangunnaaq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Canada Goose (Cackling Goose in the South)</td>
<td>Nirlinnait</td>
<td>Yes. Some people said that number has increased and others mentioned that the number has decreased. There is one kind that nests around cliffs and big hills. Arrives around the same time as light geese.</td>
</tr>
<tr>
<td>Honker (Canada Goose in the South)</td>
<td>Nirlik</td>
<td>Yes.</td>
</tr>
<tr>
<td>Common Loon</td>
<td>Tuuligjuaq or Kallulik or Tuullik</td>
<td>Yes. Some said number has decreased compared to 1948. Arrives when lakes are still frozen. Flies in circles when sees a person as if happy to see another being. Used to be common but not as much now.</td>
</tr>
<tr>
<td>Pacific Loon</td>
<td>Tuulik or Kallulik</td>
<td>Yes. Arrives when lakes are still frozen. Flies in circles when sees a person as if happy to see another being. See them once in a while.</td>
</tr>
<tr>
<td>Red-throated Loon</td>
<td>Qaqsauq or Kallulik</td>
<td>Yes. Arrives when lakes are still frozen. Flies in circles when sees a person as if happy to see another being.</td>
</tr>
<tr>
<td>Tundra Swan</td>
<td>Qurjuk</td>
<td>Yes. Some people said that number has been increasing since 2012 and others mentioned that the number has decreased. Arrives around the same time as light geese.</td>
</tr>
<tr>
<td>Sandhill Crane</td>
<td>Tatigatjuaq</td>
<td>Yes. Numbers are recovering. They eat lemmings.</td>
</tr>
<tr>
<td>Brant</td>
<td>Nirlinnait</td>
<td>Yes. Yes, but none this year and used to come by 100,000s. Numbers have been declining since 2000. Very shy. See them around the shore.</td>
</tr>
<tr>
<td>Greater White-fronted Goose</td>
<td>Nirlivik</td>
<td>Rarely see them. There are more in Whale Cove.</td>
</tr>
<tr>
<td>Common Eider</td>
<td>Mitivik</td>
<td>Yes. See them everywhere (bigger lakes). They arrive first out of all the birds. Getting more common around the lakes near Coral Harbour. Sometimes see them.</td>
</tr>
<tr>
<td>King Eider</td>
<td>Qingalik</td>
<td>Yes. Very common. See a little less compared to early 2000s. Popular for people to hunt.</td>
</tr>
<tr>
<td>Steller’s Eider</td>
<td></td>
<td>Never seen around Coral Harbour. Rare.</td>
</tr>
<tr>
<td>Long-tailed Duck</td>
<td>Aggiarjuk</td>
<td>Yes.</td>
</tr>
<tr>
<td>Red-breasted Merganser</td>
<td>Jjava or Nujaliapik or Nujalik</td>
<td>None on Southampton Island. Rare.</td>
</tr>
<tr>
<td>Bufflehead</td>
<td></td>
<td>Passes by sometimes in beginning of spring. None on Southampton Island. Never. Rare.</td>
</tr>
<tr>
<td>Green-winged Teal</td>
<td></td>
<td>Never.</td>
</tr>
<tr>
<td>Northern Pintail</td>
<td>Qummuajuq</td>
<td>Yes.</td>
</tr>
<tr>
<td>American Wigeon</td>
<td></td>
<td>None on Southampton Island.</td>
</tr>
<tr>
<td>Northern Shoveler</td>
<td></td>
<td>Yes, but only flies over. None on Southampton Island. Some said rare.</td>
</tr>
<tr>
<td>Parasitic Jaeger</td>
<td>Isunngaq</td>
<td>Yes. 50 years ago there were 50 in the harbour. Now see only 1-3 of them. Did not see them all spring until went bowhead hunting. Numbers have gone down. More common to see than pomarine.</td>
</tr>
<tr>
<td>Long-tailed Jaeger</td>
<td>Isunngaq</td>
<td>Yes. 50 years ago there were 50 in the harbour. Now see only 1-3 of them. This is the most commonly seen jaeger.</td>
</tr>
<tr>
<td>Pomarine Jaeger</td>
<td>Isunngaq</td>
<td>Yes. See them more on the sea.</td>
</tr>
<tr>
<td>English name</td>
<td>Inuktitut name(s)</td>
<td>Has this bird been seen in the Coral Harbour area? Here is what people said.</td>
</tr>
<tr>
<td>---------------------------</td>
<td>-----------------------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Thick-billed Murre</td>
<td>Akpat</td>
<td>Yes, there are millions of them at Coat’s Island. Never used to be as common in our South Bay and Bear Island as they are today.</td>
</tr>
<tr>
<td>Black Guillemot</td>
<td>Pitsiulaaq</td>
<td>Yes. A lot of them. Never used to be as common in our South bay and Bear Island as they are today.</td>
</tr>
<tr>
<td>Black-bellied Plover</td>
<td>Saarvarjaq or Tuulligaarjuk</td>
<td>Yes, but rarely see them anymore. Some people said they never see them.</td>
</tr>
<tr>
<td>American Golden Plover</td>
<td>Tuulligaarjuk or Qiirliq</td>
<td>Some people said yes, but rarely see them anymore. Other people said yes, they are still good in numbers and see them a lot.</td>
</tr>
<tr>
<td>Semipalmated Plover</td>
<td>Quilquiarjuk</td>
<td>Yes. Numbers are increasing. Do not see them as much.</td>
</tr>
<tr>
<td>Whimbrel</td>
<td>Kiasigaattiaq</td>
<td>Yes, but fewer than in the past (only saw 1 or 2). Not in Coral Harbour but at Coast Island. Only flies by during fall migration but does not land on the island.</td>
</tr>
<tr>
<td>Hudsonian Godwit</td>
<td>Sigjariajruk or Sigguraujaqujuqjuq</td>
<td>Used to see them in 1950s. Saw one recently. They are rare.</td>
</tr>
<tr>
<td>Ruddy Turnstone</td>
<td>Tuvvititiq</td>
<td>Stopped seeing them about 10 years ago. See fewer than 10 years ago. Rarely see them anymore.</td>
</tr>
<tr>
<td>Purple Sandpiper</td>
<td>Sigjariasugjuk</td>
<td>Yes.</td>
</tr>
<tr>
<td>Red Knot</td>
<td>Saarraq sigjariajruk</td>
<td>Yes, but rarely see them anymore. Do not think anyone has seen them for awhile.</td>
</tr>
<tr>
<td>Sanderling</td>
<td>Sigjariajruk</td>
<td>Yes, but rarely see them anymore.</td>
</tr>
<tr>
<td>Dunlin</td>
<td>Naarullik</td>
<td>Yes, but rarely see them anymore. Has become more and more rare since 1970s. In 1970s, Dunlins arrived at same time as geese so when saw Dunlins knew geese would be there soon too.</td>
</tr>
<tr>
<td>Pectoral Sandpiper</td>
<td>Sigjariajruk</td>
<td>Yes.</td>
</tr>
<tr>
<td>White-rumped Sandpiper</td>
<td>Sijjariajuq</td>
<td>Yes, but rarely see them in past 10-15 years.</td>
</tr>
<tr>
<td>Baird’s Sandpiper</td>
<td>Tuvvititiqjuq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Semipalmated Sandpiper</td>
<td>Quilquiliq</td>
<td>Yes, but rarely see them in past 10-15 years. Saw less right after oil spill but see them again now.</td>
</tr>
<tr>
<td>Least Sandpiper</td>
<td>Sijjariajuq</td>
<td>Yes, but rarely see them in past 10-15 years.</td>
</tr>
<tr>
<td>Red-necked Phalarope</td>
<td>Aupaqtulik saarraq</td>
<td>Never.</td>
</tr>
<tr>
<td>Red Phalarope</td>
<td>Saurraq</td>
<td>Numbers have decreased dramatically since 1970s. Some said they stopped seeing them about 15 years ago. Others said they noticed 5 years ago they were gone. Used to see 20-50 of them in flocks. Now see 1 or 2 at a time. Rarely see them anymore. Starting to come back. This summer and last spring saw about 20 of them. Our favourite. Used to be in same area where people pick light geese eggs.</td>
</tr>
<tr>
<td>Solitary Sandpiper</td>
<td>Sigjariajruk</td>
<td>Yes.</td>
</tr>
<tr>
<td>Stilt Sandpiper</td>
<td>Naarullik</td>
<td>Yes.</td>
</tr>
<tr>
<td>Sabine’s Gull</td>
<td>Iqiggariajruk or Tiritiraq</td>
<td>Rare. Used to be thousands of them. Almost extinct now.</td>
</tr>
<tr>
<td>Black-legged Kittiwake</td>
<td>Naujavaaq or Naujaq</td>
<td>Rarely.</td>
</tr>
<tr>
<td>Arctic Tern</td>
<td>Imiqqutailak</td>
<td>Yes. Some said number is decreasing where they nest. Others said there are a little too many now.</td>
</tr>
<tr>
<td>Glaucous Gull</td>
<td>Naujaq</td>
<td>Yes. Not many of them but see them.</td>
</tr>
<tr>
<td>Herring Gull</td>
<td>Naujarjuaq</td>
<td>Yes. Always see them whether want to or not.</td>
</tr>
<tr>
<td>Thayer’s Gull</td>
<td></td>
<td>Some people said yes, others said no, others said rarely.</td>
</tr>
</tbody>
</table>
## BIRDS OF CORAL HARBOUR

<table>
<thead>
<tr>
<th>English name</th>
<th>Inuksitut name(s)</th>
<th>Has this bird been seen in the Coral Harbour area? Here is what people said.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ivory Gull</td>
<td>Qakuliiit</td>
<td>Some people said yes, others said no, others said rarely. Only on Walrus Island and Coasts Island (deep water areas). Population size does not seem to grow. Early fall they are usually around but not so often.</td>
</tr>
<tr>
<td>Iceland Gull</td>
<td>Aislan naujangit</td>
<td>Some people said yes, others said no, others said rarely.</td>
</tr>
<tr>
<td>Gyrfalcon</td>
<td>Kiggaviarjuk</td>
<td>The number has gradually increased. They hunt ravens.</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>Kiggaviarjuk</td>
<td>Yes. More of them around since the 1990s.</td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>Kaajuq qinnuajuq</td>
<td>Hardly see them.</td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>Ukpijjuaq</td>
<td>Numbers go up and down. If lots of lemmings, then lots of owls and vice versa.</td>
</tr>
<tr>
<td>Raven</td>
<td>Tulugat</td>
<td>Yes. Used to be hardly any around but since the 1980s they are around a lot more. Numbers have really increased. They are a nuisance.</td>
</tr>
<tr>
<td>Rock Ptarmigan</td>
<td>Aqiggiq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Willow Ptarmigan</td>
<td>Arqiggiq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Snow Bunting</td>
<td>Amauligaq or Qaurluqtaaq</td>
<td>Yes, but freeze to death if arrive too early in spring. First to arrive in spring (April).</td>
</tr>
<tr>
<td>Mallard</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td></td>
<td>Once in awhile.</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Swallows</td>
<td></td>
<td>There are none on the island.</td>
</tr>
<tr>
<td>Lapland Longspur</td>
<td>Qiriqtaaq</td>
<td>Yes, and they nest here.</td>
</tr>
<tr>
<td>Red Poll</td>
<td>Saquariaq</td>
<td>Never.</td>
</tr>
<tr>
<td>Eskimo Curlew</td>
<td></td>
<td>Is it extinct? Last sighting was in 1969.</td>
</tr>
</tbody>
</table>
High concentration areas of light geese around Coral Harbour over different decades (based on Inuit Qaujimajatuqangit)
Low concentration areas of light geese around Coral Harbour (current and past)

Notes:
1. The above maps represent information provided by 21 participants.
2. Data includes concentration of light geese (Snow and Ross' Geese).

Legend:
Medium = Areas identified for medium light goose concentration by one or more participants.
Low = Areas identified for low light goose concentration by one or more participants.
Lowest = Areas identified for lowest light goose concentration by one or more participants out of all the areas of low light goose concentration identified by the same participant(s).
Zero = Area where light geese are absent from according to one or more participants.
High concentration areas of shorebirds (current and past)

Notes:
1. The above map represents information provided by 21 participants.
2. Data includes Whimbrels, sandpipers, plovers and other shorebirds.

Legend:
Highest = Areas identified for highest shorebird concentration by one or more participants out of all the areas of high shorebird concentration identified by the same participant(s).
High = Areas identified for high shorebird concentration by one or more participant(s).