Inuit knowledge about light geese in the Kivalliq region, Nunavut
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Participant biographies

Peter Alareak
is a member of the Nivivialik Co-Management Committee of Arviat. He was born near the old Hudson Bay Company post Padlei. He moved to the coast as a child and has lived there and in Chesterfield Inlet for most of his life. He has worked with the Kivalliq Inuit Association since the 1970s and served 2 terms on the Nunavut Planning Commission.

Louie Angalik
was born near Baker Lake on October 1, 1938, inland at Tikyalik. He was a hunter and fox trapper and still goes out wolf and seal hunting.

John Aupaq
is married and has 3 children and 1 grandson. John has been a carpenter for 20 years and hunts south and west of Arviat when he has transportation. John worked counting birds at McConnell River Migratory Bird Sanctuary for 2 years.

Leo Ikhakhik
is a hunter and polar bear guard in Arviat.

Paul K. Irksuk
is a hunter, a retiree, an artist, and a musician who performs mostly gospel songs all over the Arctic with his sons.

George Kuksuk
served as Arviat North-Whale Cove’s MLA, and is a former mayor of Arviat. He enjoys hunting, fishing, curling and snowmobiling.
Jimmy Main
was born and raised in Arviat and is fluent in English and Inuktitut. He is an avid outdoorsman and hunter, and a father. He was a Hamlet Councilor and is the Regional Director for Nunavut Housing Corporation.

Catherina Manik
was born on the land on October 23, 1942, and goes out hunting. She is married and is a grandmother.

Arden Nibgoarsi
was born in Arviat on November 6, 1953. He was raised in Arviat. He became a teacher in 1993 and worked for 23 years. He enjoys hunting and dog mushing and fishing.

Joe Savikataaq Sr.
was a Conservation Officer with the Department of Environment for close to 30 years. He enjoys hunting, fishing, small aircraft piloting, boating and scuba diving.

Melanie Tabvahtah
is an active hunter and mother.

David Aglukark Sr.
is the chair of the Niwialik Co-Management Committee of Arviat which is responsible for the Kuugaayuk (McConnell River) Migratory Bird Sanctuary.

Luke Kinniksie
has three children and many grandchildren. He used to be an active hunter.
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 June 2017 through interviews, group discussions, participatory mapping, and site visits with 20 Arviat residents who were identified by the Project Management Committee.

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 Arviat 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.

Key findings

Here is what Arviat residents said about light geese:

- The ban on hunting and collecting migratory bird eggs was very hard for Inuit to bear, and caused the overabundance of light geese that is happening today.
- Light geese meat (goslings and adults) and eggs had great cultural significance in the past.
- Today, cultural significance varies by person/family as do taste preferences for geese.
- People described different things about the size of the light goose population around Arviat, 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 and this is fine, (4) the goose population is decreasing in some locations and research is needed, and (5) unsure if the goose population is increasing or decreasing and research is needed.
- People described different things about the impacts of light goose droppings on the land and water. Goose droppings are (1) contaminating the hamlet’s drinking water source; (2) contaminating the land; (3) helping the land by adding nutrients; and (4) not having any impact on the land.
- People described different things about how light geese have changed the land. They mentioned that (1) geese are impacting the land by grazing and nesting, and in the spring people can tell where the geese have been eating and pulling out plants; and (2) geese are not impacting the land in the nesting area, and it is not changing because as soon as they nest, they start walking, so they do not feed that much in the nesting area.
- 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 (lakes are drying up);
  - The vegetation has changed. There are more shrubs, bushes, and more grasses and vegetation to eat;
  - Other animals have changed. There are more predators, and geese are competing with them for food;
  - Light geese are moving to find new nesting areas. Due to the population increase they do not have enough area to lay their eggs;
  - Light geese have changed the land by pulling out plants. When animals like caribou and geese do not have enough food in one area, they look for other places with more food; 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 the light geese and caused them to move to new areas.

Here is what Arviat 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 such as (1) the number of shorebirds has increased; (2) the number of shorebirds has not changed over time; (3) the number of shorebirds has decreased; and (4) they were unsure about shorebird numbers.
- Reasons given about why fewer shorebirds are seen nowadays include:
  - Climate change (shallow ocean, drier land, expanding habitat north);
  - Changes in food source (less worms, smaller shrimps, roots of plants affected);
  - Changes in predators (new kinds of birds especially Bald and Golden Eagles, more polar bears and seagulls); and
  - Increased human activity and new methods of transportation create noise and activities that impact shorebirds.
Light geese and shorebird management strategies

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

- Hire local hunters to harvest geese. Ship geese to other communities and developing countries.
- Inuit should continue to harvest geese and eggs. Non-Inuit should still require permits but they should be allowed to harvest any amount of any type of geese, in any season.
- Discuss this challenge and do something before the population drops suddenly due to disease or other (as Inuit Qaujimajatuqangit says will happen).
- Take no action. The number of geese is fine and geese will self-regulate their population.
- Scientists should investigate the size of the light goose population near Arviat.

Here is what Arviat residents said about shorebird and other bird management strategies that could be implemented in the future:

- “They will come back. We can’t do anything about it. I would love to see them come back”.
- Inuit need to do more research. Together, scientists and community members should investigate the size of the bird populations near Arviat, especially birds that are here all year (e.g. ravens, eiders and Dovekies).
- Community-based monitoring about light geese and other birds should be done.
- Community members and scientists should do the research together at the same time. That way they can have discussions as the research is being done, versus talking to community members first, then bringing IK holders and scientists together later.

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 in the Avviat Inuktitut dialect) 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.

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

Photo credit: Nell Moore
Photo credit: Justin Lawson
Photo credit: Brooke Miller

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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 Nivvialik 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 Nivvialik 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 Nivvialik 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

Light geese and Inuit knowledge

In Nunavut, light geese are harvested by Inuit. Inuit have lived and hunted in the areas of the light goose 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 Arviat 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

This project was conducted under research license 03 015 17N-M from the Nunavut Research Institute. Informed consent was received prior to interviewing 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 20 Arviat community members. In June 2017, Natalie Carter (ECCC) trained Arviat Community Researchers Aupaa Irkok and Shelton Nipisar to facilitate participatory mapping and conduct interviews and focus groups. They taught Natalie how to do research in Arviat. Together Natalie and Aupaa refined the draft questions (developed by Natalie, Vicky Johnston, Paul Smith, Gita Ljubicic, Dominique Henri, and Arviat PMC members) to ask the research participants (see Appendix II – Interview Questions). Aupaa 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, Aupaa, and Shelton interviewed and conducted focus group discussions with 20 Arviat hunters, elders, and community members over a 21-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. Bobby Suluk and Angelina Suluk 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

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<td>Research proposal development</td>
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<td>February 2017</td>
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<td>Planning November 2017 results sharing and validation meetings in Arviat</td>
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<tr>
<td>November 2017</td>
<td>In-person meetings in Ottawa</td>
<td>Training community researchers in analysis, map digitizing, report writing, presentation preparation and infusing their feedback and input into project outputs (maps, reports, presentations) over the course of seven days</td>
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<td>November 2017</td>
<td>In-person meetings in Arviat</td>
<td>Results sharing and validation in Arviat</td>
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<tr>
<td>December 2017</td>
<td>In-person in Quebec City</td>
<td>Presentation at ArcticChange 2017 conference (community researcher Lenny Emikaut from Coral Harbour on behalf of PMC)</td>
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<tr>
<td>February 2018</td>
<td>Conference call</td>
<td>Planning April 2018 results sharing in Arviat</td>
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<tr>
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<td>Results sharing and refinement of management recommendations</td>
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Project guidance

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

Analysis

Aupaa and Shelton spent one week in Ottawa in November 2017 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. Shelton 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. The summary was translated into Inuktitut and reviewed line-by-line by the PMC and Arviat community members in November 2017, with support from Vicky and Natalie. Natalie edited the community 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 Bobby Suluk.

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 November 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 Arviat, 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 and water; 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.
Past cultural significance of light geese

Harvesting ban
- It was really hard being an Inuk because families, especially pregnant women for their babies, liked to eat different types of food for their diet. Inuit were not allowed to hunt migratory birds or eat eggs. RCMP officers would take the geese, and eggs, and hunters’ rifle if they were caught. People secretly harvested geese and eggs. That ban is why geese are in such high numbers today – because Inuit were not allowed to harvest. (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.)

Meat
- When people went from one place to another with their family, and travelled by dog team, they harvested a lot more animals, even geese.
- People really depended on geese and goslings for food. Sometimes they were the only source of food for families.
- “We were taught that we should never throw rocks at birds to play with them. We were taught we must eat whatever was caught”.
- Before there were shot guns, men would hunt gosling before they could fly by running after them and grabbing them.
- Boys went hunting with their fathers.
- People would just pluck the feathers of the Snow Geese and throw away the carcass of the goose or whatever they were unable to consume.

Eggs
- People really depended on eggs for food in the springtime. Sometimes they were the only source of food for families.
- Eggs had particular importance because of their abundance. People only took a couple of eggs from each nest and did not take the whole nest away which was according to Inuit knowledge (IK) about harvesting eggs.

Other uses
- “Our ancestors said that when the first geese would arrive in Nunavut each year it was a sign that the ice would be gone soon”.
- Wings were used as a broom or for dusting and as toys; feathers were used for pillows and as a towels; and skins were used to store things in.
Current cultural significance of light geese

**Harvesting ban**
- “Nowadays we do not have to hide any of the geese or eggs that we harvest. Hallelujah!” (because the restrictions on Inuit harvesting light geese and their eggs no longer exist).
- “We don’t want to see regulations in the Inuit territory and laws drawn up for us or restrictions”.

**Meat**
- “Light geese meat and eggs are beneficial. We love light geese”.
- People enjoy eating all types of geese.
- Light geese are an important food source for some people. Hunters harvest enough for their immediate and extended family, and for elders in the community, and ship geese to family in other communities. Light geese that are not eaten are fed to dogs.
- Light geese are stored in the community freezer for the year.
- Young people, including teens, hunt light geese and other birds, and share them with elders.
- People do not harvest as many light geese as they did in the past.
- There is less reliance on light geese. It is more that it is something different to eat.
- Not that many people actually eat light geese these days. A lot of people shoot them and feed them to dog teams.
- Some people will not eat a Snow Goose or Ross’ Goose because they do not like the taste. Some people prefer to eat all kinds of geese. Blue Phase tastes better than Snow and Ross’ Geese.
- People no longer eat goslings.
- People get angry when they see seagulls picking up goslings and eating them alive.

Photo credit: Natalie Carter
Current cultural significance of light geese

Eggs
- People collect up to 300 eggs per day for their family or to ship to other communities.
- People are not following IK about harvesting eggs. Instead of taking only 1 or 2 eggs from the nest, they are taking too many eggs, and sometimes the whole nest.
- Some people, not many, will eat eggs after the chick has started to form inside (fertilized eggs).
- Light geese are just as important today for eggs and meat as they were in the past.

Other uses
- Wings are used as a broom or for dusting.
- Light geese are used as shooting targets to fix scopes.

[Images of light geese eggs and shooting targets with credits: Photo credit: Natalie Carter, Photo credit: Lenny Emiktuut, Photo credit: Aupaa Irkok]
Population is increasing and there are too many geese

- “We have so many geese! And we need to do something about the number of them. They even look like snow there are so many. There are lots more today than in the past [since 1946]”.

- IK says that when there are too many of a certain kind of animal they will start getting less in number. Geese may start dying through sickness or some other way. Then there will be no geese.

- Light geese can be a risk to aircrafts [jets], although there is no jet service to Arviat yet.

Population has not changed and this is fine

- “The population of the geese has never changed. We are not the owner or the boss of the geese so whatever they’re coming in numbers, it’s fine with me”.

Population is fine

- “I have no concerns about light geese”.
- The number of geese is fine as is. They seem to be regulating themselves.

Population is decreasing and research is needed

- “Snow Geese are getting less because there are hardly any eggs. Scientists should investigate if there are too many in this area. They should come here, watch, and decide”.

Unsure if the population is increasing or decreasing but research is needed

- “The number of light geese there are is alright. Maybe they have changed routes. We think they have declined or increased but we don’t know. It would be a good idea for bird researchers to find out about the population”.

Any animal whether they are caribou or other animals, some years, they increase in number.
Light geese impacts on the land, water, wildlife, and people

Light geese impacts on the land and vegetation

Geese are impacting the land by grazing and nesting

- When geese move to another area, wherever they eat upon has changed, and they ended up moving to another area to get food. If there is not enough vegetation in one area, they move. And maybe in a year or two, they will move back. They are moving back and forth.
- The geese usually stay in one place. The droppings and other mess caused by geese are usually washed up or cleaned out by the ice or the snow and start fresh each spring. Once the land was nice and beautiful and clean but when the geese started arriving they started making a mess and droppings. The habitat that they were in changed.
- In the spring, people can tell where the geese have been eating and pulling out plants.

Geese are not impacting the land

- “I think in the nesting area, it’s not changing. Because as soon as they nest, they start walking, so they don’t feed that much in the nesting area. You can see that on the shores some areas there is not much vegetation. That black stuff where the iron salts come up. It started a long, long time ago and has nothing to do with the Ross’ Geese”.

Unsure if geese are impacting the land

- “I do not remember if the ground was being eaten up. As an Inuk, I did not really realize about the ground being over eaten”.

Light geese droppings are fertilizing the land and feeding other animals

- Before the geese got to the land, the land was beautiful, nice and fruitful but now there are a lot of droppings. It is okay because the droppings dry up and turn into soil or food for other animals.

Light geese droppings are having no impact on the land

- The amount of bird droppings is not having an impact on the land at all.
Light geese impacts on water
• There was recently a boil-water advisory issued for Arviat. A lot of people say it’s due to the amount of bird droppings at our water source.

Light geese interactions with other animals
• There used to be lots of geese at the McConnell River Migratory Bird Sanctuary but the number decreased because of the larger predators that are digging what geese can’t dig. Maybe these predators are the cause of geese decline in that area.

• Polar bears are in that same area as geese and they sometimes eat what the geese have to eat.
• There are so many light geese today that there are less Canada Geese or other types of geese.
• Some people are more concerned about regular geese because there used to be lots of geese flying near the community. But nowadays, more light geese are coming. Maybe the regular geese are migrating on another route further away from the community and the route is more being used by the light geese.
Why light geese have moved to new areas

Light geese have moved due to climate change

• Due to climate change this year there was not enough snow on the ground. This spring was different. Geese mostly laid eggs inland, and the concentration of geese was further north, more inland. Maybe because there was more water on the coastal area.
• The land itself has changed a lot. There are more marshes, shrubs and bushes than before.
• The way the tundra is growing is different now than many years ago. Even near the community, there used to be open water between islands but it’s dry land now.
• The land is growing a lot faster than in the past. There is more vegetation (grasses and mosses) for geese to eat so they move there to eat it.

Light geese have moved to find food

• When animals like caribou and geese do not have enough food in one area, they look for other places with more food. That is why animals are always moving around. Sometimes there are more animals in one area but they are always moving to another place. That is same with the geese population.
• In spring, geese migrate along coast and in the fall, they migrate further inland. This is because they have different food needs at different times of the year.
• Maybe the goose problem down South is because farmers’ fields are providing them with too much good food. Geese will go where the food is. In the fall geese gather together in one area to feed on cloudberrys to ‘gas up’ before they go south.

Light geese have moved to find new nesting areas

• “Every spring when the geese lay their eggs I am not sure if they are able to change the terrain but maybe the area where they lay their eggs might change because the terrain is different nowadays. Maybe they are looking for a place that is better for them to lay eggs”.
• They started moving north because they are increasing in number and they don’t have enough area to lay their eggs.

Only young geese are moving to new areas

• It is only the younger geese (2 to 3 years old) that are colonizing new areas. The older geese return to their traditional spots to breed.

Presence of predators

• Maybe the geese are moving to another area because of the seagulls eating their babies.

Human activity

• When there were no all-terrain vehicles (ATVs) south of the community there used to be a lot of geese eggs but nowadays there are not that many geese eggs.
• Geese are moving locations because of noise from the community and from snowmobiles and ATVs.
• Every year along the same route, the Bombardier carries a heavy load, some humungous heavy equipment for mining companies, from Arviat to Churchill and back through McConnell River MBS which means food change for these birds and it comes up short.
Potential strategies for managing the light goose population

Expand the local harvest
- The geese from this area can be harvested and sent to third world nations where people go hungry. When geese are coming in, there should be workers that harvest, prepare, and inspect them. The funds would be for geese hunters in this area.
- “We can harvest as many as we can, collect them, and send them to communities that need them”.
- The HTO used to hire people to get Snow Geese for a couple of years. That was really helping. But every year the number of geese seems to be not decreasing.
- In 2017 under the Nunavut Hunters Support Program, Arviat HTO paid hunters to hunt geese. Harvested geese were distributed to elders in the community.
- Just as we have people that keep polar bears away, we need people to look after the number of light geese.
- “Why do we keep talking about finding out how many geese there are? Instead harvest and cut down the numbers for the people in the South (farmers, pilots) who have the concerns. They know in the South there are too many affecting them so…”

Expand sport hunting opportunities
- It would be very useful if Inuit could harvest any number of geese and collect their eggs. Qablunaat should still obtain licenses for harvesting geese but be able to harvest all kinds of geese, any number, and in any season.

Conduct more research
- “I don’t think anything should be done. I don’t see that there are too many. The scientists should be investigating if there are too many in this area”.
- Microchip light geese to track where they are seasonally (e.g., during nesting, migration). It is expensive but a lot has been spent on this Inuit knowledge research too to try to find out the same thing. It will cut down on expenses in the long run. It is a better way to find out where birds are in the Kivalliq region. Install the chips here so that this is the first point of information versus installing them in the South as some geese from the South might not come to Kivalliq region.
- “Do not change harvesting from the way it is today. I see no need. A lot of us do not eat Snow Goose eggs so they may spoil if we collect too many. Inuit Qaujimajatuqangit [IQ; Inuit traditional knowledge] says eggs should only be collected based on what people need. Find out more about how many there really are”.
- People are concerned about the health of geese feeding at the sewage lagoon and if the geese are safe to eat. No one would hunt them at the lagoon but they may fly elsewhere and be hunted. What contaminants do light geese meat and eggs contain? This should be found out.

Take no action
- “I am comfortable with the way the light geese are. Do not do anything. We are comfortable how we hunt them and pick eggs. Only farmers in the South and pilots have a problem with the light geese. They are not a problem at our airport runway”.

Remember IQ about overpopulation and disease in animals
- “We should discuss how we can try and slow them down a bit before they fall, before they drop. IQ has it that if we leave them as it is they are going to drop in numbers. Then there will be none”.
- “For our forefathers, according to IQ, it was so important to keep the animals very clean [without disease] and protected. There were no Northern stores. If something happened that one of the animal species overpopulated it would be bad news. We should keep that in mind too. Protecting wildlife is good – but if a species is overpopulated and then [the population] dropped, that would be bad news”.

Other comments
- You could hire half the town to shoot them and I do not think you would even make a dent in the population. It may just have to go its natural cycle unless some disease infects the population.
- “We stopped hunting geese for a while [during the ban], the numbers exploded, and now we have a problem with the birds. They made the problem! They have to solve the problem now”.

Potential strategies for managing the light goose population
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.
Eggs and meat

- Back then all kinds of birds were used. Their meat and skin were used for anything.
- Even small eggs like Arctic Tern eggs could be gathered in enough numbers when other food was not very available in between seasons (e.g., if caribou disappeared or if fish had not come down the rivers yet). They helped people to get by between seasons.
- “I used to put raw eggs in my cup and drink them”.
- People used to kill, pluck and eat Snow Buntings and Sandpipers raw or our mothers would cook them (around 1953-1954). People used an upside-down pot or a frying pan, with a little stick with a line and put worms under the pan. The bird would go in to eat the worms, then people would pull the line to make the stick fall, and trap the bird.
- People hunted seagulls and jaegers with a baited fish hook at the end of a long line. Seagulls or jaeger would swallow it. Seagulls and sometimes jaegers were fed to dogs. Or jaegers were eaten (around 1953-1954).

Fat

- People burned shorebird fat in stoves or lamps (qulliq) like seal blubber.
- People skinned birds very properly so it could be made into a bowl shape that included the bird fattening area. It would be used as a qulliq. Grass or lichens and bird fat would be burned in it.
- People rubbed shorebird fat on caribou skins and mostly on seal skins to soften them during tanning, and still do today.
- People used bird fat while sewing when making sealskin boots (kamik) to make the boots more waterproof, or so that the kamik would stay soft while gathering on the front and backsides of the sole of the boot.
- People used bird fat to help get a fire started when using a white stone to make a spark.
- People used the whole skin as a cloth for cleaning hands because of the oil.

Past cultural significance of shorebirds and other birds
Past cultural significance of shorebirds and other birds

Other uses

- Shorebirds were a sign that the season is going to start changing.
- People would pluck one feather from a bird, and use it to know the wind direction.
- Groups of seagulls were a sign there was an animal or a mammal somewhere.
- Snowy Owl wings were placed over a hole in the ground as part of a trap, or over a seal hole to know the seal was about to surface.
- Toys were made by putting string in the claw bone then you could pull the string to make the foot open and close.
- The bird would be skinned and used to store stuff in, or put grass in to keep the fire in.

Fun to see and there were many of them

- They were fun to see when we were younger, and chased around and played with, but we did not often pay attention to them.
- “I did not notice those little shorebirds when I was young. A bird is a bird. But one thing I would always be noticing is that come August or September when it was time for the migratory birds to go back south Sijjariaq (sandpipers) would be flying with abundance always. I do not know what the shorebirds were used for but I know there were many of them.”
Eggs and meat
- People used to eat shorebirds and their eggs more than they do today. Now that there are stores people do not bother with shorebird eggs and meat very much.
- Eider ducks are really good for eating.
- Terns are edible but hardly anyone eats them.
- Most bird eggs, especially Arctic Terns, are delicious and people go for them but there are some that are not eaten:
  - Sandhill Crane – because we have heard that in the South they eat human remains and they are ugly;
  - Whooping Crane – because they do not taste like Snow Geese eggs. Also, they would injure people with their beak;
  - Seagulls – the eggs are really nice but are not usually eaten because gulls are always at the dump. Also, we have heard that in the South gulls eat human remains;
  - Loons – their eggs are good but they are ugly. People used to eat them but now that there are stores they don’t;
  - Owls;
  - Jaegers – their eggs are not eaten because they are ugly; and
  - Ptarmigans – they have very good eggs but they are very mean, tough birds.

Indicators of weather and other animals
- Whimbrels are a sign that it is about to get windy and boaters should head for shore.
- If many gulls are in one area and there is a big boulder, then a polar bear will be on top.
- When shorebirds are making a lot of noise and flying in groups they are a sign that there is something ahead, maybe an animal, like a seal or beluga.
- When ptarmigans are in great number, they are a sign that the caribou herd is close by.

Other comments
- “Some people cannot really tell shorebirds apart, and they see them as one [species of] bird”.
- “There are different kinds of shorebirds and mainland birds. Most of the people by IQ – by the sound that birds are making – we can tell what kind of birds they are. And we know where we can see them”.
- Before people would rather use a small calibre gun, pellet gun or sling shot. It’s different today. As soon as they see a little bird, they grab a stick.
- Nowadays there are so many things that are easy to access because of our modern ways that we don’t bother with using shorebirds anymore. We are forgetting the uses and importance of the birds’ feathers and skins.
Shorebird and other bird population size

Shorebird and other bird populations are declining
- “We sometimes think of what kinds of shorebirds we saw when we were younger and that we don’t see anymore”.
- “We saw more eider ducks and Arctic Terns in the past”.

Shorebird and other bird populations are increasing
- “Nowadays we see different species of shorebirds and gulls along the coast of Arviat that we have never seen before”.
- “Every year there seems to be more shorebirds. I don’t have any concerns about them”.
- There seems to be more shorebirds nowadays. They don’t lay that many eggs so they are not increasing more than Snow Geese.

Shorebird and other bird populations are changing
- Every year the bird populations are different. Because of weather conditions they go to different places, so it is hard to know if the numbers have changed.
- It is just a cycle where they are located in one area, and then they cannot be seen very often, and they probably moved to another area.

Shorebird and other bird populations are not changing
- There has been no real change in their numbers. There are still huge flocks of them.

Unsure if shorebird and other bird populations are changing
- Little birds are a bit too far from people to be seen clearly. They stay away from people.
- It is hard to tell if there are more or less shorebirds, but community members would know and be aware when the birds are getting more and when they are declining.
- No one has complained that shorebirds are declining.
Why shorebird and other bird population size has changed

Global warming and climate change

- There are less shorebirds in those areas where they used to be because of global warming. Where the tide used to be 50 years ago, it is now land. The tide does not come in as far as it used to. What was under the sea is now land. But these shorebirds still get around.
- The area where shorebirds are located is different. There are more islands and the ground is drying up. The ocean is becoming shallower. Because of climate change, shorebirds are changing. There are some species of birds today that we have never been seen before. Shorebirds relocated so people do not see them as much anymore.
- Some shorebirds are not seen today because they are moving further north. Maybe because of the climate changing. Animals’ behaviours are changing. They are following the changing of the climate.
- According to the change of the weather people see new types of shorebirds.

Food availability

- The food that is available for these little birds is changing as the ocean gets shallower. There are less worms because the area is so shallow. There were areas that used to be lakes but they are just dry land now so the roots of the plants are being affected as lakes dry up. That is why the birds that eat worms and other insects are being affected by the changing of the season. Shrimps used to be bigger. Maybe they have moved to a deeper area of the ocean. That is why we cannot find shrimps like before and are finding smaller shrimps nowadays.
- Sometimes shorebirds starve. Maybe if the scientists can do research about why some animals or birds die naturally, or if they die because of other animals.

Photo credit: Mike Stegmann
Why shorebird and other bird population size has changed

Presence of predators

Other birds
- Shorebirds are quite small and they can easily get away from their predators.
- The problem is with the other bird predators that go for small birds and eggs.
  - Peregrine falcons, hawks, eagles, seagulls and jaegers are working on the small shorebirds especially in nesting time when they have a young one to feed.
  - “When I was young, we hardly ever saw any eagles but now there are lots along the coast, especially in summer time. They’re increasing in number every summer. That could be one of the problems because they go after smaller birds”.
  - Jaegers and seagulls are bad with catching small birds. They are not decreasing or increasing the population. But they are predators.
  - “Terns have a hard time with jaegers because jaegers move just as fast as terns. There are not many jaegers but they are mean. They go after nests and poke them”.
  - Once people start seeing less gulls around town, it is because the baby geese hatched. They leave the dump and go feed on baby geese.

Polar bears
- With so many more polar bears around, more nests are being emptied as polar bears eat all the eggs.
- The number of polar bears each summer at one of the main shorebird nesting sites here in Arviat (Sentry Island) has significantly increased. Most summers in the last 5 years, there were upwards of 10 bears on the island most of the summer. They probably prey on small chicks since the chicks can’t get away. They probably eat a fair amount of them.

Foxes
- Shorebirds nest away from mainland predators like foxes, but cannot get away from seagulls. Sometimes there are more foxes in one year and sometimes hardly any.

Photo credit: Getty Images Sergey Gorshov Minden Images
Why shorebird and other bird population size has changed

Shorebirds do not interact with light geese

- “Shorebirds are found along the coast at low tide. Snow geese are found where grass and swamps are located. They don’t interact with each other. When geese and shorebirds are together they mind their own business, and eat from different sources”.

Human activity around Arviat has not had an impact on shorebirds and other birds

- The people that live here have not had an impact on shorebirds because they do not hunt or kill them. The environment and pollutants are affecting the population.
- Long-tailed duck are still there, hanging around there. Because they hide and lay eggs, where there is low-hanging vegetation. Or they look for dark moss because it is camouflaged with their feathers. They cover the eggs with down which matches the soil. So you might be standing right there and sometimes you don’t see them.

Human activity around Arviat has had an impact on shorebirds and other birds

- “There are usually lots of seals along the bay maybe because the ocean is a lot warmer than before. And seals are always after Arctic cod. Maybe because of the annual fishing derbies there is not enough Arctic cod. We don’t see seals along the bay anymore. And we don’t usually see shorebirds either”.
- “The gulls change everything because they eat everything and they are always hungry. And they get in our fishing nets and get our char before we get them”.
- Sometimes loons get caught on nets and they are very hard to get out.
- “Someone was shooting shorebirds at the sewage lagoon”.
- Mallard ducks bump into the power wires and people have seen dead mallards and other shorebirds near the power poles.
- White-rumped Sandpipers are attracted to the light from ATV headlights and are hit by ATVs or passengers (one flew right into someone’s mouth).

Other comments

- “Maybe there is some reason why they are moving. I don’t care about them because I don’t eat them”.
- When land animals can’t find anything to eat they move to another area. With birds, it’s not like that. People only know if shorebirds move when they move their nesting eggs.
- We just started seeing Bald Eagles around this area.
- Not too long ago an elder saw a humming bird right next to him.
- “There’s a shorebird that comes up to this area once in a long while. They have a long neck. They look like pelicans”.

"There are so many people, transportations, kids out, dogs, people at cabins or having picnics, hanging around. It is scary for animals like small ptarmigan, geese, etc. so there are hardly any close to town. When there were less people, the birds were very close by”.
- There is quite a bit of erosion at The Point which may impact their nesting sites.
Potential strategies for managing shorebirds and other birds

- “They will come back. We can’t do anything about it. I would love to see them come back”.

- “We Inuit need to do more research. Together, scientists and community members should investigate the size of the bird populations near Arviat, especially birds that are here all year, like Ravens, eider ducks, and Dovekies”.

- Community-based monitoring about light geese and other birds should be done. Community members and scientists should do the research together at the same time. That way they can have discussions as the research is being done, versus talking to community members first, then bringing IK knowledge holders and scientists together later.
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 Arviat 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 IK, 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.
INVITATION LETTER

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 Nivvialik Area Co-Management Committee, Arviat 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 Arviat 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.

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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: ____________________________________________
Appendix II – Interview questions

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. Are the same names used in Arviat or should we change these?

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. Are the same names used in Arviat or should we change them?

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 ARVIAT

<table>
<thead>
<tr>
<th>English name</th>
<th>Inuktitut name(s)</th>
<th>Have you seen this bird around in Arviat? 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>Kangut</td>
<td>Yes.</td>
</tr>
<tr>
<td>Canada Goose (Cackling Goose in the South)</td>
<td>Nirllinnait</td>
<td>Yes.</td>
</tr>
<tr>
<td>Honker (Canada Goose in the South)</td>
<td>Nirlik</td>
<td>Yes, but fewer than in the past.</td>
</tr>
<tr>
<td>Brant</td>
<td>Nirllinnait</td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Greater White-fronted Goose</td>
<td>Nirlivik</td>
<td>Yes.</td>
</tr>
<tr>
<td>Common Eider</td>
<td>Mitivik</td>
<td>Yes.</td>
</tr>
<tr>
<td>King Eider</td>
<td>Qingalik</td>
<td>Yes.</td>
</tr>
<tr>
<td>Steller’s Eider</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Long-tailed Duck</td>
<td>Aggiarjuk</td>
<td>Yes.</td>
</tr>
<tr>
<td>Red-breasted Merganser</td>
<td>Java or Nujaliapik or Nujalik</td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Bufflehead</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Green-winged Teal</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Northern Pintail</td>
<td>Qummujuuq</td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>American Wigeon</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Northern Shoveler</td>
<td></td>
<td>Not mentioned.</td>
</tr>
<tr>
<td>Parasitic Jaeger</td>
<td>Isunngaq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Long-tailed Jaeger</td>
<td>Isunngaq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Pomarine Jaeger</td>
<td>Isunngaq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Thick-billed Murre</td>
<td>Akpat</td>
<td>Yes.</td>
</tr>
<tr>
<td>Black Guillemot</td>
<td>Pitsiulaaq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Black-bellied Plover</td>
<td>Saarvarjuuq or Tuulligaaarjuk</td>
<td>Yes, but new.</td>
</tr>
<tr>
<td>American Golden Plover</td>
<td>Tuulliggaaarjuk or Qiirliq</td>
<td>Yes, but new.</td>
</tr>
<tr>
<td>Semipalmated Plover</td>
<td>Quliquialjuuq</td>
<td>Yes.</td>
</tr>
<tr>
<td>Whimbrel</td>
<td>Kiisigaattiaq</td>
<td>Yes – some said there are less now.</td>
</tr>
<tr>
<td>Hudsonian Godwit</td>
<td>Sigjariaarjuk or Sigguruajuaquqtjuj</td>
<td>Yes.</td>
</tr>
<tr>
<td>Ruddy Turnstone</td>
<td>Tuuvititiq</td>
<td>Some said yes. Some said yes but not as many as before. Some said not anymore.</td>
</tr>
<tr>
<td>Purple Sandpiper</td>
<td>Sigjariasugjik</td>
<td>No.</td>
</tr>
<tr>
<td>Red Knot</td>
<td>Saarraq sigjariaarjuk</td>
<td>No.</td>
</tr>
<tr>
<td>Sanderling</td>
<td>Sigjariaarjuk</td>
<td>Some said yes. Some said no.</td>
</tr>
<tr>
<td>Dunlin</td>
<td>Naarullik</td>
<td>Yes, but some said not as many as before.</td>
</tr>
<tr>
<td>Pectoral Sandpiper</td>
<td>Sigjariaarjuk</td>
<td>Some said yes. Some said no.</td>
</tr>
<tr>
<td>White-rumped Sandpiper</td>
<td>Sijjariaarjuuq</td>
<td>Yes.</td>
</tr>
<tr>
<td>English name</td>
<td>Inuktitut name(s)</td>
<td>Have you seen this bird around in Arviat?</td>
</tr>
<tr>
<td>------------------------------</td>
<td>------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Baird’s Sandpiper</td>
<td>Tuvittiqkuq</td>
<td>Yes</td>
</tr>
<tr>
<td>Semipalmated Sandpiper</td>
<td>Quiqiliq</td>
<td>Yes</td>
</tr>
<tr>
<td>Least Sandpiper</td>
<td>Sijjariaq</td>
<td>Yes</td>
</tr>
<tr>
<td>Red-necked Phalarope</td>
<td>Aupaqtulik saarraq</td>
<td>Yes, but some said not as many as before.</td>
</tr>
<tr>
<td>Red Phalarope</td>
<td>Saurraq</td>
<td>Yes, but some said not as many as before.</td>
</tr>
<tr>
<td>Solitary Sandpiper</td>
<td>Sigjariarjuk</td>
<td>Yes</td>
</tr>
<tr>
<td>Stilt Sandpiper</td>
<td>Naarullik</td>
<td>Yes</td>
</tr>
<tr>
<td>Sabine’s Gull</td>
<td>Igiggariarjuk or Tiritiraq</td>
<td>Some said no – only see it near Churchill. Some said rare to see it. Some said they see it now.</td>
</tr>
<tr>
<td>Black-legged Kittiwake</td>
<td>Naujavaaq or Naujaq</td>
<td>No</td>
</tr>
<tr>
<td>Arctic Tern</td>
<td>Imiqqutailak</td>
<td>Yes – many</td>
</tr>
<tr>
<td>Glaucous Gull</td>
<td>Naujaq</td>
<td>Yes – many. Most common.</td>
</tr>
<tr>
<td>Herring Gull</td>
<td>Naujarjuaq</td>
<td>Yes – many</td>
</tr>
<tr>
<td>Thayer’s Gull</td>
<td></td>
<td>No</td>
</tr>
<tr>
<td>Ivory Gull</td>
<td>Qakuluuit</td>
<td>Some said no – only see it near Churchill.</td>
</tr>
<tr>
<td>Iceland Gull</td>
<td>Aislan naujangit</td>
<td>Some said never see it. Some said rare to see it.</td>
</tr>
<tr>
<td>Gyrfalcon</td>
<td>Kiggaviarjuk</td>
<td>Yes</td>
</tr>
<tr>
<td>Peregrine Falcon</td>
<td>Kiggaviarjuk</td>
<td>Yes</td>
</tr>
<tr>
<td>Rough-legged Hawk</td>
<td>Kaajuq qinnuajuaq</td>
<td>Yes</td>
</tr>
<tr>
<td>Snowy Owl</td>
<td>Ookpik or Ukpijujuaq</td>
<td>Yes</td>
</tr>
<tr>
<td>Raven</td>
<td>Tulugat</td>
<td>Yes, but only since 1974.</td>
</tr>
<tr>
<td>Rock Ptarmigan</td>
<td>Aqiggiq</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Willow Ptarmigan</td>
<td>Arkiggiq</td>
<td>Yes</td>
</tr>
<tr>
<td>Snow Bunting</td>
<td>Amauligaaq or Qaurluqtaaq</td>
<td>Yes</td>
</tr>
<tr>
<td>Whooping Crane (Note: The participant may have meant Sandhill Crane)</td>
<td>Tatigatjuaq</td>
<td>Yes. The number is increasing.</td>
</tr>
<tr>
<td>Tundra Swan</td>
<td>Qurjuk</td>
<td>Yes</td>
</tr>
<tr>
<td>Mallard</td>
<td></td>
<td>Yes. Even in winter.</td>
</tr>
<tr>
<td>House Sparrow</td>
<td></td>
<td>Yes. Even in winter. They stay inside house vents and fly when not too cold or stormy in February.</td>
</tr>
<tr>
<td>American Robin</td>
<td></td>
<td>Yes, but new</td>
</tr>
<tr>
<td>Hummingbird</td>
<td></td>
<td>Yes, but new</td>
</tr>
<tr>
<td>Bald Eagle</td>
<td></td>
<td>Yes, but new and really increasing.</td>
</tr>
<tr>
<td>Golden Eagle</td>
<td></td>
<td>Yes, but new and really increasing.</td>
</tr>
<tr>
<td>Great Black-backed Gull</td>
<td></td>
<td>Yes, but new</td>
</tr>
<tr>
<td>Rusty Blackbird</td>
<td></td>
<td>Yes, but new</td>
</tr>
<tr>
<td>Eastern Bluebird or smaller – really blue</td>
<td></td>
<td>Yes, but new</td>
</tr>
</tbody>
</table>
High concentration areas of light geese around Arviat over different decades (based on Inuit Qaujimajatuqangit)
Notes:
1. The above maps represent information provided by 20 participants.
2. Data includes concentration of light geese (Snow and Ross' Geese).

Legend:
Highest = Areas identified for highest light goose concentration by one or more participants out of all the areas of high light goose concentration identified by the same participant(s).
High = Areas identified for high light goose concentration by one or more participants.
Low concentration areas of light geese around Arviat over different decades (based on Inuit Qaujimajatuqangit)
Notes:
1. The above maps represent information provided by 20 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.
High concentration areas of shorebirds around Arviat (current and past)

Notes:
1. The above map represents information provided by 20 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).