

NWMB INTERIM REPORT

Project Number: 4-10-02

Project Title: Local knowledge and surveys on declines of Arctic terns near Rankin Inlet and Whale Cove

Prepared by:

Mark Mallory *Canadian Wildlife Service, Prairie and Northern Region, Box 1714, Iqaluit, NU, X0A 0H0*
mark.mallory@ec.gc.ca; 867 975 4637

Jason Akearok, *Canadian Wildlife Service, Prairie and Northern Region, Box 1714, Iqaluit, NU, X0A 0H0*
jason.akearok@ec.gc.ca; 867 975 4641

Summary:

Arctic Tern eggs are an important food resource of harvesters in Nunavut, notably in the Kivalliq region. Harvesters in several communities, but notably Rankin Inlet and Whale Cove, have expressed concern over declining numbers of terns near their communities, and seek research to address the issue. In response to the communities' interest, and following discussion with them, we conducted an Inuit Qaujimagatuqangit (IQ) study at both communities to document the historical and current distribution of tern colonies, and to gauge community thoughts on the possible causes of decline. We worked with the local HTOs to select ~ 10 local residents with knowledge of Arctic terns. All interviewees were presented with a consent form (in Inuktitut and English) prior to the interviews and asked if they consent to be interviewed and recorded and that the information that they provide would be used for management purposes, annual reports and potentially in a published report. Interviewees were paid ~ \$60 honoraria per interview or up to \$150 for a full day. The IQ information will be used to: 1) assess the historical and current population trend of Arctic terns; 2) provide input into a Nunavut-wide management of tern colonies and; 3) develop a community-based monitoring program for terns and other marine birds near these communities. Through the Inuit Field Research Assistant program from the Inuit Impact Benefit Agreement for National Wildlife Areas and Migratory Bird Sanctuaries, we also provided a training opportunity for a student to assist with the project. The information gathered from the IQ interviews would also be summarized in an annual report, digital format databases and potentially in a scientific journal so that it is accessible to future researchers and members of the local community.

Introduction:

Arctic terns (*Sterna paradisaea*), variously called *Immiquitailaq* or *Tikatikiaq* in Inuktitut, are a marine bird found across Nunavut, from the Belcher Islands to Ellesmere Island, and from Kugluktuk to Qikiqtarjuaq. Terns generally nest on low, gravel offshore islands, in colonies from 50 to 3000 pairs (in Nunavut, generally < 500 pairs; Hatch 2002). There is no reliable population estimate for Nunavut, although we know that the counts are more than 15,000 birds, and likely more than 100,000 (Hatch 2002). Eggs of this bird are highly sought by members of many communities, and are considered a “delicacy”.

The Nunavut Wildlife Harvest Study (NWHS; Priest and Usher 2004) showed that tern eggs were harvested in different communities, in numbers up to several hundred per year (e.g. Iglulik averaged > 300 eggs/year), and with an annual estimated territory-wide harvest of more than 600 eggs. However, our subsequent discussions with hunters suggest that both the number of harvesters that collect eggs and the number of eggs taken is much higher than the NWHS might suggest. Certainly many eggs are collected by children and others moving to and from camps (personal communication), and many tern eggs probably were included in the “unspecified egg” category, which had > 6000 eggs collected in some years.

Arctic terns are long-lived, colonial breeders with low reproductive rates, making them vulnerable to population declines. They will abandon nesting sites and move colonies *en masse* in response to poor breeding conditions (Hatch 2002), which could be linked to food supplies, predation, or disturbance (Gilchrist and Robertson 1999).

Arctic tern populations are currently a concern in Canada (Canadian Wildlife Service [CWS] 2009), as numbers of terns have declined at colonies in the Bay of Fundy, southern Hudson Bay (Gilchrist and Robertson 1998) and in parts of northern Hudson Bay (Tony Gaston, pers. commun). Harvesters in the Kivalliq Region have expressed concern over declining tern numbers near the communities of Rankin Inlet and Whale Cove (NWMB Regional Wildlife Priorities 2007, and our discussions with hunters). However, the CWS has little historical information from these areas upon which to make comparisons of tern populations or to begin to assess why colonies may be declining. Thus, to be able to examine and interpret both the community concerns and the causal factors influencing changes in terns near these communities, the CWS needs to initiate background data gathering and visit colony sites. Our intention was to follow the approach that we have used previously (Mallory et al. 2001, 2003), by initiating local knowledge interviews with hunters in the communities, and conduct site visits with community members to develop a background on historical and current conditions for terns near these communities.

Wildlife Management Priorities

The 2007 Kivalliq Region Wildlife Management Priorities included 4 points that are addressed in this study: (1) use of IQ in wildlife management (priority #1); (2) develop methods to increase and facilitate community involvement in

wildlife research (priority #1); (3) research on Arctic terns (priority #2); and (4) effects of egg harvest on bird population conservation (priority #3).

By conducting interviews with local hunters and visiting as many colony sites as possible, we will assess habitats and colony sizes near Rankin Inlet and Whale Cove to provide a baseline dataset for future study efforts of populations near these communities. We hope that this will initiate collaborative, community-based monitoring on terns and other marine birds in this area.

Project Objectives:

The overall purposes of the proposed research are: 1) assess historical and current status of terns breeding near Rankin Inlet and Whale Cove; 2) provide the resultant data for input into Nunavut-wide management of tern colonies; and 3) develop a community-based monitoring program for terns and other marine birds near these communities.

Specifically, we shall:

1. Derive estimates of nesting locations of adult Arctic terns, tern chicks and potentially re-nesting terns breeding near Rankin Inlet and Whale Cove;
2. Assess habitat conditions at historical and current colony locations (garbage, evidence of predators, physical disturbance from waves or ice, etc.);
3. Determine historical patterns of colony locations, reproductive success, and egg harvest at colonies through collection of IQ information from elders and hunters in Rankin Inlet and Whale Cove;
4. Assess feasibility of restorative measures for tern colonies;
5. Ensure that results are distributed to interested parties and the public nationally, and within Nunavut. This requires a variety of communication approaches including scientific manuscripts, annual reports, and educational materials for the public in Nunavut;
6. Work with the communities to develop a community-based annual monitoring program, so we can determine whether steps are possible to improve breeding conditions for birds and thus harvest conditions for these communities.

Study Area:

The interviews on changes in numbers of Arctic terns (and other birds) were conducted in Rankin Inlet and Whale Cove. We got locations where tern nesting sites were found in the past, and where local residents know about current tern colonies, to count the number of nesting birds in the area. These were within a day's boat trip from the community.

Methods:

The research on terns near Rankin Inlet and Whale Cove was be divided into two components: *IQ interviews* and *field surveys*.

IQ interviews

Based on our previous work investigating issues of bird distribution, abundance or population trends near communities, we have had great success preceding surveys with local knowledge interviews, such as for Harlequin Ducks (Mallory et al. 2001, 2003), Ivory Gulls (Akearok et al. 2002, Gilchrist et al. 2005) and protected areas planning near Qikiqtarjuaq (Mallory et al. 2006). Thus, we were confident in our approach, which was led by a skilled, Inuk biologist who is fluent in Inuktitut (Jason Akearok), and has conducted many local knowledge interviews in communities across Nunavut.

Our first step was to work with the HTOs in Rankin Inlet and Whale Cove, to select approximately 10 hunters from each community who are thought to have good experience in harvesting bird eggs, specifically Arctic terns. We developed an interview form (questionnaire) with the HTO, to lead discussions with individual hunters and elders so that we can develop a picture of historical patterns of Arctic tern colonies near the communities, Inuit use of the colonies, and try to determine factors that may be different now than in the past (e.g. weather patterns, predation, numbers of harvesters, etc.). The questionnaire was based on similar questionnaire models we have used in gathering IQ on wildlife previously. The interviews were conducted in Inuktitut (if requested), and maps were provided to help gather all possible information on tern colony characteristics. The results will be transcribed and translated, and information from the maps will be transferred to a GIS database and map (ArcView).

Surveys of tern nesting colonies

Arctic terns typically nest in colonies on small, low islands. The CWS has very little information on specific tern colony locations in the Kivalliq Region. Even the Nunavut Atlas (Riewe 1992), a compilation of community information on wildlife and land use in their area, provides little on tern colonies. Nonetheless, the distribution of small, offshore islands (see Google Earth images – Appendix C) near the communities are ideal nesting sites for terns and other marine birds.

In 2010, one boat traveled from each community to visit a few locations where there were formerly tern colonies, and where there are thought to still be tern colonies. All safety materials (floater jackets, satellite phones, firearms for bear deterrence, etc.) were taken during the trips. Field personnel recorded whether there are obvious deleterious changes to the nesting islands that might affect the choice of terns to move away (e.g. garbage, disturbance, new signs of predators, etc.). Locations of colonies will be marked by GPS. If colonies are found, numbers of birds at sites and numbers of nests will be recorded, for comparison to breeding parameters at other tern colonies. Physical characteristics of the islands will be recorded, and all data will be entered into MSExcel spreadsheets, and data, including geo-referenced coordinates, will be used for analyses and map production. Maps and reports will be translated and returned to the communities. The CWS staff will then visit the communities and discuss options for establishing a community monitoring program on terns and other marine birds.

This proposal has been reviewed and is supported by the relevant Canadian Wildlife Service managers and other scientists.

Key Results

IQ Interviews: Rankin Inlet

Eleven local Rankin Inlet residents were interviewed in August 2010. Most of the elderly interviewees and the long-time residents of Rankin Inlet stated that they did not see as many Arctic terns near their community as they did in the past. The younger interviewees (30 years and younger) and the people who recently moved to Rankin Inlet did not notice a difference in the number of Arctic terns but that some of them had heard of people stating that they no longer see as many terns near their community. Furthermore, most of the elderly and the long-time residents also stated that they noticed fewer and fewer terns were nesting on some of the islands that they used to nest at. Some of the reasons that they suggested were that the terns were moving to different nesting locations and some suggested that they were nesting further north to communities near Chesterfield Inlet. Some also stated that they may have moved due to increased garbage near their nesting areas. Also, some of the younger interviewees also stated that they heard from local people that they were seeing fewer and fewer terns nesting on some of the islands that they typically nest.

IQ Interviews: Whale Cove

Thirteen Whale Cove residents were interviewed. A local high school student was hired to assist in the interviews through the Inuit Field Research Assistance Program. Nearly half of the people interviewed were originally from other Nunavut communities and the majority of them did not notice a change in the number of Arctic terns around Whale Cove. But most of the long-time residents of Whale Cove did say that they no longer see as many terns near their community and some of them stated that they rarely ever see them near their community like they used to in the past. The majority of the long-time residents interviewed stated too that they no longer see as many terns nesting on some of the islands that they used to nest at. They said that terns are likely nesting at different locations and that it is a normal cycle for terns, birds and all animals to move over the years. They also suggested that more terns may be nesting further north.

Survey: Rankin Inlet

Three islands were surveyed in the Rankin Inlet area (Fig. 1). Site 1 contained a mix of small grass, gravel, rock and sand and had no evidence of any terns nesting that 2010 summer season. The guides did state that the island typically did have terns nesting on site 1 in the past. There was a red fox on the

island and one of the guides suggested that there were now more foxes in the area and that they may be responsible for terns moving off from the island. The next island surveyed was at site 2 and it consisted of lots of vegetation from 2 ft. grasses, marshy areas, mossy tundra and gravel areas along the edge. Site 2 contained approximately 300 terns around the island. One nest with one egg was found. No tern chicks were located on the island. Site 2 also contained several hundred shorebirds on the island from sandpipers to plovers as well as phalaropes and turnstones. It also contained approximately 20 Brant geese and around 30 black guillemots swimming around the island. Site 3 had no terns but had over 100 female common eiders and 7 common eider nests were found and they had 3 to 5 eggs per nest. Several female eiders were swimming with chicks around the island. There were over 60 black guillemots swimming around the island and over 20 ruddy turnstones as well. Site 3 was mostly gravel and bare rock.

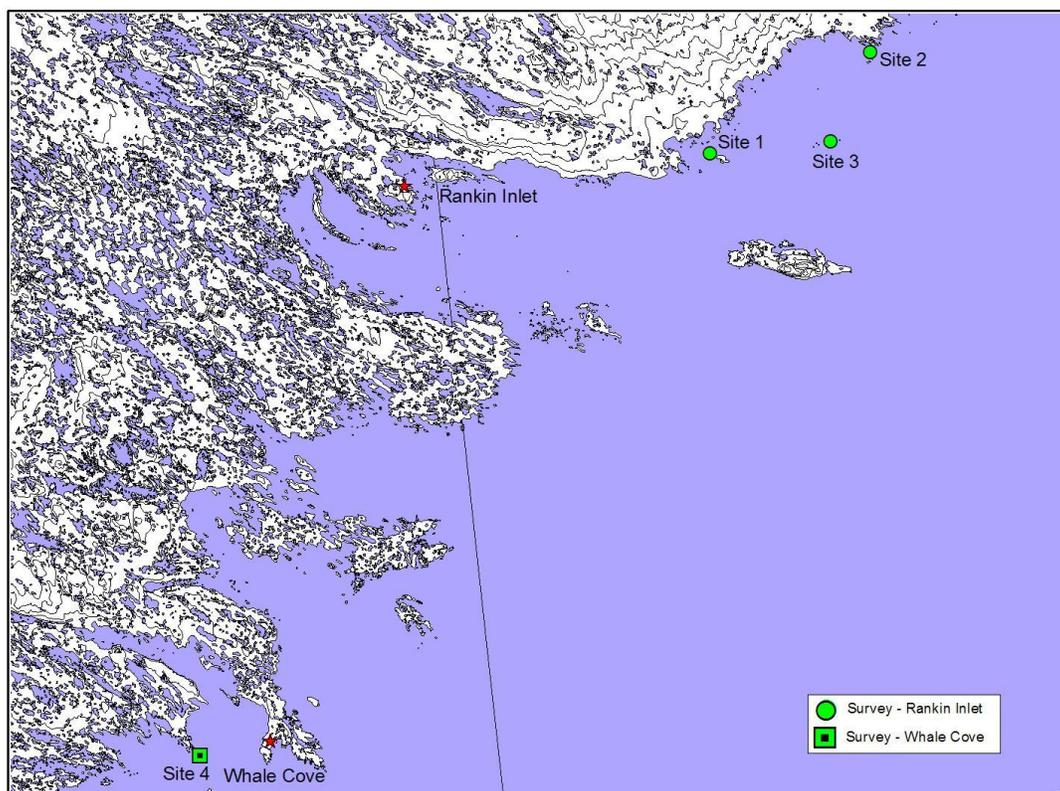


Figure 1. Arctic tern survey sites near Rankin Inlet and Whale Cove.

Survey: Whale Cove

There was no opportunity for me to join the Arctic tern survey due to strong winds while in Whale Cove. However, the two guides that were hired did manage to survey one island (site 4). At site 4, the island contains long grasses in the middle of the island and bedrock around the edge. The island contained

approximately 50 terns (30 adults and 20 chicks). Of the 20 chicks, 15 were flying and 5 were found hiding amongst the grass and cracks in the rocks. Ruddy turnstones were also found on the island.

Discussion

IQ Interviews

The majority of the elders and the long-time residents in both communities stated that they no longer see as many Arctic terns near their community like they did in the past and that there are fewer terns nesting on islands that they used to nest at. Most of the interviewees were not concerned of a decline in terns and they stated that they had likely moved to new nesting locations and some of the interviewees said that more terns may be nesting closer to communities like Chesterfield Inlet and further north. Terns are thought to re-nest at the same colony at larger more stable colonies but they are also known to fluctuate and some colonies, likely due to food and/or predators (Hatch 2002). At site 2 near Rankin Inlet, there was a fox on the island and it had a black guillemot in its mouth so it may be that terns were not present on site 2 due to predators. Other predators such as polar bears (*Ursus maritimus*) have been known to predate colonies in the Arctic (Grant Gilchrist, pers. comm.; Leafloor et al. 2000). Furthermore, in 2000, Iqaluit residents were stating that common eiders were nesting closer to the community and were no longer nesting on 'traditional' island as they had in the past due to predation from polar bears.

Some of the Rankin Inlet and Whale Cove interviewees did state that all animals tend to move and that it is part of a cycle and that they expected terns to be back nesting on the islands that they were not nesting currently. A number of the interviewees also stated that the terns may be nesting further north near communities like Chesterfield Inlet. As a follow-up, we will be going to Chesterfield Inlet to interview up to 15 local residents to see if they are in fact seeing more Arctic terns near their community. The project has been approved by the Nunavut Wildlife Management Board to use the remaining Nunavut Wildlife Research Trust Fund to proceed with the local knowledge study. The results from those interviews will help in providing a more complete picture of the Arctic tern status in the Kivalliq Region and the adjoining Baffin Region.

Management Implications

Local knowledge studies have been shown to be invaluable (Akearok et al. 2002; Hay 2000). The Rankin Inlet survey (Fig. 1) did show that one of the islands (site 1) had no evidence of terns nesting in 2010 even though the guides and interviewees said that site 1 typically used to have terns nesting on it. Most of the long-time residents and elders that were interviewed did state that they have noticed that fewer and fewer terns nesting on 'traditional' islands. In Whale Cove, most of the long-time residents and elders were stating that they no longer see as many terns near their community and, like Rankin Inlet interviewees, that

terns may now be nesting at different locations, possibly near Chesterfield Inlet and further north. The Rankin Inlet and Whale Cove interviews and survey was a constructive collaboration between the CWS and the local community that can be utilized again in future for establishing management plans. Furthermore, following up with Chesterfield Inlet interviews could potentially illuminate a broader picture of the status of Arctic terns in the Kivalliq and SW Baffin Region.

Reporting to Communities

All the interviews will be transcribed and translated and the survey results will be recorded onto an excel file and onto ArcGIS. Once completed all the information will be sent to the Rankin Inlet, Whale Cove and Chesterfield Inlet Hunter's and Trapper's Organization for their comments.

References

- Akearok, J. A., Mallory, M.L. and Fontaine, A.J. 2002. Community knowledge on Ivory Gulls near the Brodeur Peninsula, Baffin Island. Can. Wildl.Serv. Tech. Rep. No. 378, 59 pp.
- CWS. 2009. Canadian Wildlife Service Seabird Technical Committee Meeting Minutes. St. John's Newfoundland, October 29, 2009.
- Gilchrist, H. G., and G. J. Robertson. 1999. Population trends of gulls and Arctic terns nesting in the Belcher Islands, Nunavut. Arctic 52: 325-331.
- Gilchrist, H. G., M. L. Mallory, and F. R. Merkel. 2005. Can traditional ecological knowledge contribute to wildlife management? Case studies of migratory birds. Ecology and Society, 10: 20 [online] URL: <http://www.ecologyandsociety.org/vol10/iss1/art20/>
- Hatch, J.J. 2002. Arctic tern (*Sterna paradisaea*). The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North American Online: <http://bna.birds.cornell.edu/bna/species/707>
- Hay, K. 2000. Final report of the Inuit bowhead knowledge study. Nunavut Wildlife Management Board, Iqaluit, Nunavut, Canada.
- Leafloor, J.O., Hill, M.R.J., Rusch, D.H., Abraham, K.F., and Ross, R.K. 2000. Nesting ecology and gosling survival of Canada geese on Akimiski Island, Nunavut, Canada. Canadian Wildlife Service Occasional Paper 103.
- Mallory, M. L., J. Akearok and A. J. Fontaine. 2001. Community knowledge on the distribution and abundance of species at risk in southern Baffin Island, Nunavut, Canada. Can. Wildl. Serv. Tech. Rep. No. 363, 68 pp.
- Mallory, M. L., H. G. Gilchrist, A. J. Fontaine, and J. A. Akearok. 2003. Local ecological knowledge of ivory gull declines in Arctic Canada. Arctic 56: 293-298.
- Mallory, M. L., A. J. Fontaine, J. A. Akearok, and V. H. Johnston. 2006. Scientific study, local ecological knowledge and the development of a

- marine wildlife area along eastern Baffin Island, Nunavut, Canada. *Polar Record* 42: 1-12.
- Priest, P., and Usher, P.J. 2004. Final report. The Nunavut Wildlife Harvest Study. Nunavut Wildlife Management Board, Iqaluit, Nunavut, Canada.
- Riewe, R. R. (editor) 1992. The Nunavut Atlas. Canadian Circumpolar Institute, Edmonton, Alberta.