

Final Project Report to NWMB – September 2022

1. **NWSF Project Number:** NWRT-3-21-03
2. **Project Title:** High arctic beluga whale stock structure
3. **Project Leader:** Cortney Watt, Fisheries and Oceans Canada, 501 University Crescent, Cortney.Watt@dfo-mpo.gc.ca, 204-983-5103
4. **Summary:**

Relatively little is known about high Arctic beluga whales, which are a shared subsistence resource for hunters in Canada and Greenland. The last focused research on this population occurred in the early 1990s and since then there have been significant changes in the environment and increased anthropogenic activities in their summering area. Whales from this population are hunted on the summering grounds by Canadian hunters and in the winter by hunters from Greenland. Hunters from high Arctic communities in Canada have taken less than 30 beluga whales on average annually over the last 10 years, but the hunt in Greenland is significantly higher (~220 beluga per year over the last 10 years). Beluga whales that were satellite tagged around Somerset Island have travelled to West Greenland and the North Water in the winter. It is unclear if these whales that overwinter in different areas represent different stocks and should be assessed individually. Shipping pressure related to a gold mine near Hope Bay has also increased and information on how whales are responding to ships in the region is unknown. To ensure this population is sustainable, information on stock structure, genetic composition, and animal behaviour is needed. This study will use non-invasive techniques to monitor beluga whales in their natural habitat and will include use of drones to collect photographs and video to assess body condition, relative abundance, and coastal residency time, underwater hydrophones to collect information on acoustic responses, and ancient DNA techniques on historical samples to assess stock structure.

5. Project Objectives:

We proposed to return to the Somerset Island-Prince Regent Inlet region in the summer of 2021 to launch a comprehensive study on the impacts of a changing Arctic on beluga whales and investigate how belugas respond and adapt to these impacts. We planned to use non-invasive and remote-sensing approaches that minimize disturbance and do not require contact with the whales. Initially the project included five integrated components that included assessing behaviour, genetics (both newly collected and ancient DNA), evaluating growth and body condition, and working towards estimating abundance. Due to COVID19 the project as presented was cancelled in summer 2021; however, a much smaller project was run near the community of Resolute Bay by the Resolute Bay Hunters and Trappers Association (HTA), attempting to collect drone images of beluga whales to train the local pilot, and assess photographs to determine if whales are marked and individually identifiable.

6. Materials and Methods:

A DJI mini drone was flown by a drone pilot, Pilipoosie Iqaluk, near the community of Resolute Bay, Nunavut, to capture imagery of migrating beluga whales. The DJI mini is a small (<250g) drone and was flown both from land and a boat.

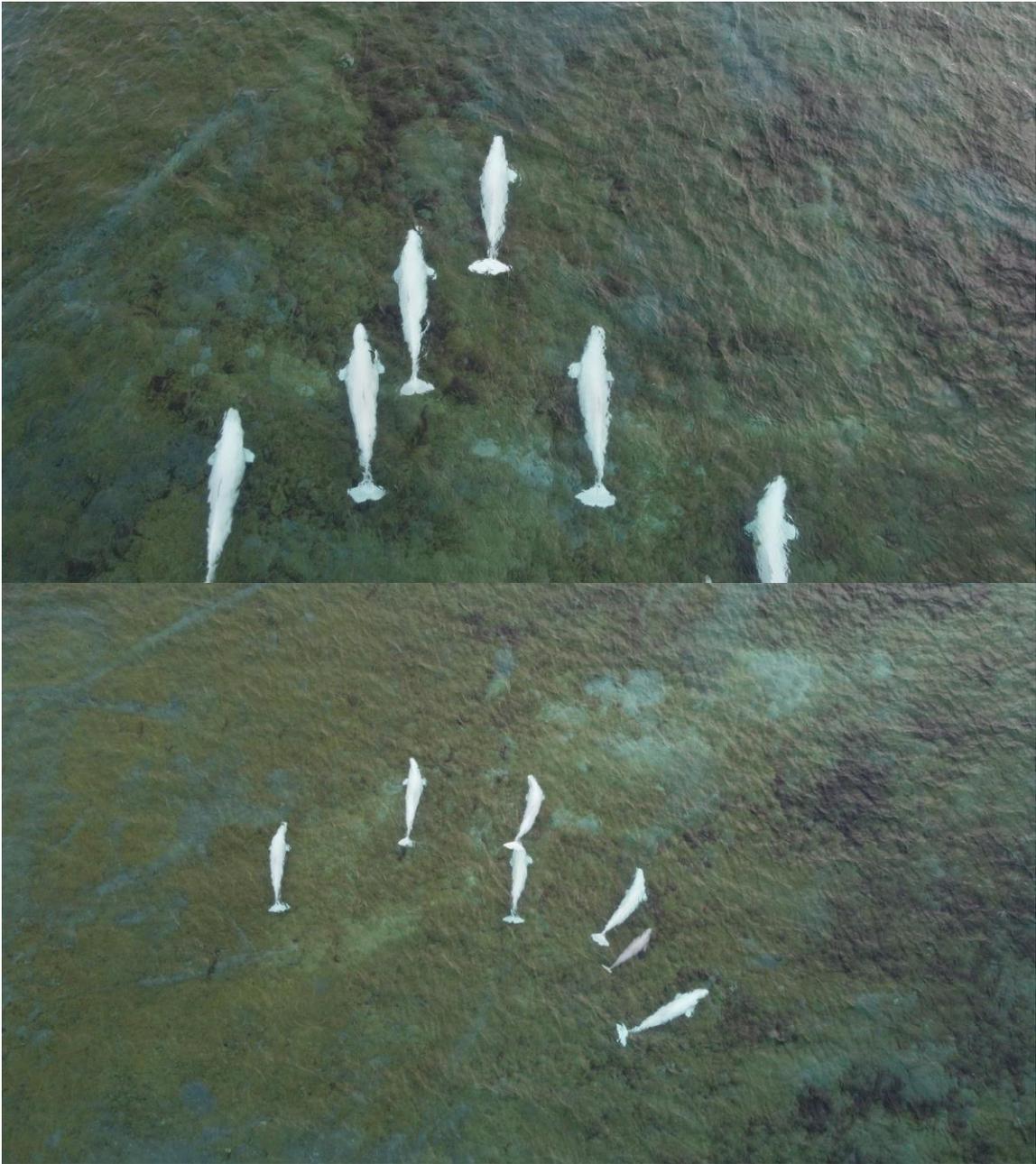
7. Project Schedule:

The project schedule

Output	Start date	End date	Complete
Community consultation	18/01/2020	Ongoing	Yes. All consultation occurred through email/telephone correspondence due to COVID19.
Hiring and training UAV pilot	04/01/2021	08/15/2021	Yes. Pilipoosie Iqaluk was sent all equipment and information and trained with the UAV before field work.
Field work	08/15/2021	10/15/2021	Yes fieldwork was completed but whales were quite a bit later arriving than expected, and inclement weather prevented some of the anticipated field days. Four fieldwork days occurred.
Data analysis	10/15/2021	10/31/2021	Only a few photographs were captured and have been reviewed.
Final reports/publications	01/15/2022	Still planned	Further data collection will be needed to meet project deliverables.
Present results to Resolute Bay	May 2022	Still planned	An in-person meeting has been requested via email to discuss 2021 and the field work planned in 2022.

8. Preliminary Results/Discussions

Preliminary results suggest that flying a drone to collect imagery of beluga whales is a non-invasive and cost effective way to study this population. It was reported that many of the whales have unique markings that may make them photographically identifiable. Resolute Bay, Nunavut, is not the ideal location to implement the program as the whales do not tend to summer around the area and rather migrate past; however, this summer provided the opportunity for the drone pilot to become comfortable with operating the drone and observing the whales. The pilot is interested in continuing this work in summer 2022 near Creswell Bay, Nunavut and we hope this will be a long-lasting collaborative relationship studying beluga whales from the high Arctic population. Below are some examples of the images Pilipoosie was able to capture. He learned some lessons that capturing the whales at the surface of the water is difficult and tracking them with the drone can be challenging. We anticipate improved imagery with further training and practice.



9. Reporting to Communities/Resource Users

As a result of safety concerns associated with the ongoing COVID19 pandemic, unfortunately in person consultations did not occur this season. All discussions about the program occurred through email and telephone correspondence. The Resolute Bay Hunters and Trappers Association was supportive of the work and assisted with finding a suitable drone pilot.