

NWRT Final Project Report

1. NWRT Project Number: NWRT-2023-0000000015

2. Project Title: Admiralty Inlet narwhal tagging and drone work

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4. Summary:

The Baffin Bay narwhal population was last surveyed in 2013 for an abundance estimate. Since the survey, shipping traffic in the area has doubled and the environment has changed. In addition, Inuit have recently observed displacement in narwhal distribution. Thus, a new abundance estimate of the Baffin Bay narwhal population is overdue. We are proposing to conduct fieldwork to support a narwhal aerial survey (proposal NWRT-2023- 0000000007: HACS 2023 by Cortney Watt). Proposed work would provide an adjustment factor for narwhals that are underwater during the time of the survey (adjustment for availability bias). We are proposing to develop the adjustment factor by: 1) using drone video to follow individual narwhals and quantify their diving pattern and 2) remotely equip narwhals with tags that provide location and depth data. This information will help to provide a more accurate abundance estimate and provide science advice on levels of Total Allowable Harvest of narwhals.

5. Project Objectives:

The main purpose of this research was to develop adjustment factors to account for narwhals that are underwater during the 2023 aerial survey. The two specific objectives were:

- 1) To determine proportion of time that narwhals spend at the surface of the water
- 2) To investigate the level of synchrony in the diving behaviour of narwhals in large aggregations.

The project objectives stayed the same. However, we were not able to achieve them all because of fieldwork challenges (see below).

6. Materials and Methods:

We set-up a camp north of Kakiak Point. The project involved two main methods. We had planned to remotely deploy satellite tags on narwhals. However, we did not get the right opportunity in the field to try it. We used drones to capture videos of narwhals. We used two different types of drones, DJI Mavic 3 and the Matrice 300RTK. The drones were flown from the shore at a minimum altitude of 20 m for the Mavic 3 and 60 meters for the Martrice 300RTK. We employed 9 Nunavut beneficiaries for a total of 34 people-days. We were not able to train participants in the remote tagging because this part of the work did not take place.

7. Results

We collected 3.1 hours of drone videos with narwhals and 1.7 hours with bowhead whales. We were able to follow complete dive cycles of narwhals. These videos will be analysed to extract the surface and dive time for narwhals. We will also combine these data with data from previous years and other narwhal locations. These data will inform the adjustment factor for the estimate of the abundance of narwhals as part of the High Arctic Cetacean survey (NRTW 2023-00000007).

As part of an ArcticNet funded project, we organized a training session for Nunavut beneficiaries to fly drones and analyse videos. The workshop took place in March 2024 at the Canadian High Arctic Research Station in Cambridge Bay. Two participants in this project also took part in the drone workshop.

8. Discussion/Management Implications

The data generated from this study will be used to feed into the estimation of the abundance of the Baffin Bay narwhal population. Specifically, we develop a factor to account for narwhals that were underwater during the time of the aerial survey. Ultimately, the new abundance estimate will be use to provide advise on sustainable hunt of the Baffin Bay narwhal population.

9. Report by Inuit participants

There were several Inuit participants from Arctic Bay who took part in the field work. They were all employees of Arctic Bay Adventure, an Inuit owned outfitting company. We did not receive any formal written reports from the participants; however, it was not part of the participants' tasks to write a report. During the field program, Inuit participants had several occasions to provide informal input about the project.

10. Reporting to communities/resource users

All consultation was done with the Ikajutit HTA in Arctic Bay.

Before Research (date/consultation type)	During Research (date/consultation type)	After Research (date/consultation type)	Will there be in-person consultation after the research is complete?
<p>Date: January 2020 Type: In person meeting in Winnipeg to discuss aerial survey plans and associated tagging program. Meeting included representatives from Arctic Bay and 5 other communities</p>	<p>Date: July/August 2023 Type: In person meetings with the Ikajutit HTA 3 times while we were in Arctic Bay during the field work. We introduced all staff participating, discussed methods, answered questions, and modified our approach</p>	<p>Date: Fall 2024, email and phone conversation with Ikajutit HTA.</p>	<p>Date: Winter 2025 Type: in person Community visits to present results and draft final report (together with narwhal survey results)</p>
<p>Date: March 11 2022 Type: Phone meeting with HTA Board to Initiate consultation about potential work on narwhals</p>		<p>Date: February 27-28 2024 Type: In person meeting in Arctic Bay with HTA and community as part of a larger narwhal consultation. Presented update</p>	

		about the abundance estimate of the Baffin Bay narwhal population.	
<p>Date: January 12 2023</p> <p>Type: Email letter to ask for feedback and support for narwhal project</p>		<p>Date: Summer 2024</p> <p>Type: In person meeting with Ikajutit HTA about next steps for this project.</p>	

11. References

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