

## Final Project Report to NWMB – September 2024

1. **NWSF Project Number: NWRT-2023-0000000007**
2. **Project Title:** High Arctic Cetacean Survey 2023
3. **Project Leader:** Cortney Watt, Fisheries and Oceans Canada, 501 University Crescent, [Cortney.Watt@dfo-mpo.gc.ca](mailto:Cortney.Watt@dfo-mpo.gc.ca), 204-983-5103  
Marianne Marcoux Fisheries and Oceans Canada, 501 University Crescent, [Marianne.Marcoux@dfo-mpo.gc.ca](mailto:Marianne.Marcoux@dfo-mpo.gc.ca)

#### 4. **Summary:**

A survey of narwhal, beluga and bowhead whales was conducted in the Canadian high Arctic in August 2023. The last survey of all the narwhal stocks simultaneously occurred in 2013 and since then, there is further research which supports potential movement of narwhals among previously defined summering regions. As a result, surveys of all the stocks within a short period of time was needed. The survey covered areas previously surveyed for these stocks in 2013 (Doniol-Valcroze et al. 2015), while incorporating information and knowledge from the communities Hunters and Trappers Organizations that was sought during a scoping meeting in January 2020, follow up meetings in early 2023, and satellite telemetry of narwhals (Watt et al. 2012; Marcoux and Watt 2021) to determine high-use areas. Surveys were flown in four DeHavilland Twin Otters (DH-6) equipped with bubble windows and a camera hatch at the rear. Overlapping photographs were taken along transect lines from an altitude of 610 m (2000 ft) at a target speed of 110 knots. Two camera systems were installed in the twin otter camera hatch. Each system consisted of a Nikon D850 camera, a Garmin GPS unit and a laptop computer. Geo-referenced images were saved on the laptop in real time and will be analyzed for all marine mammal sightings. This survey will provide updated abundance estimates for all the Canadian Baffin Bay narwhal stocks, Cumberland Sound beluga whales, and Eastern Canada-West Greenland bowhead whales.

#### 5. **Project Objectives:**

The main purpose of this survey was to provide new abundance estimates and associated advice on Total Allowable Harvest for narwhal, beluga and bowhead whales. The research objectives were to provide:

- i. **Updated abundance estimates for the Somerset Island, Admiralty Inlet, Eclipse Sound, East Baffin Island, and Jones and Smith Sound narwhal stocks.**
- ii. **An updated abundance estimate for the threatened Cumberland Sound beluga population.**
- iii. **An updated abundance estimate for Eastern Canada-West Greenland bowhead whale population.**
- iv. **Advice on total allowable landed catch for each of these stocks.**

## 6. Materials and Methods:

Surveys took place from August 11 to August 30 2023. Surveys were conducted from four DeHavilland Twin Otters (DH-6) fitted with four bubble windows, placed at the front and rear windows, and a ventral camera port to allow photographs of the ocean surface to be taken. The camera port was open-air to prevent dirt and water spotting, and because an infrared camera (FLIR) was used to video the sea surface in one aircraft.

The survey was flown along predetermined systematic transect lines at a ground speed of 200 km/hr (110 knots). Surveys included at least two observers looking through bubble windows to note whale occurrence. Ice concentration, sea state, fog, and glare were also recorded throughout the surveys, particularly when conditions changed noticeably. Cameras were positioned straight down to take photos through the ventral camera hatch from an altitude of 610 m (2000 ft). The camera systems consisted of a Nikon D850 camera fitted with a 25 mm and 55 mm lens. Cameras were connected to a Garmin GPS (Bad Elf) via a Bluetooth module accessory (Foolography Unleashed D200+ Bluetooth Module), allowing the laptop computer to save geo-referenced images in real time. Survey images were taken at an interval of 3 and 6 seconds for the 55mm and 25mm lenses, respectively. One aircraft was also equipped with FLIR infrared camera to assist with identifying whales in ice and seals.

## 7. Project Schedule:

The project schedule

Output	Start date	End date	Complete
HTO engagement on survey design	2022/12/15	2023/08/11	Yes. All consultation occurred through in person meetings and email.
Survey	2023/08/09	2023/08/30	Yes. Survey was successfully completed.
Data analysis	2023/10/15	2025/04/30	Analysis of the photographs is complete. Analysis of final abundance estimates is underway and anticipate it will be peer reviewed in Spring 2025.
Report back to communities	2023/10/15	2024/06/27	Field reports and posters (English and Inuktitut) were sent to the communities. In-person follow up meetings occurred in Arctic Bay, Pond Inlet, Pangnirtung and Taloyoak.

## 8. Preliminary Results/Discussions

The survey successfully covered all planned transects for narwhal stocks in Admiralty Inlet (AI), Eclipse Sound (ES), and East Baffin Island (EBI) (Figure 1). The Somerset Island narwhal stock (SI) was also fully covered less four lines in Prince Regent Inlet (Figure 1). The Jones (JS) and Smith Sound (SS) narwhal stocks were also fully covered, less Mackinson Inlet which was visited and found to be fully ice covered (Figure 1). All planned transects for Cumberland Sound (CS) beluga whales were

completed with replicate surveys conducted in Clearwater Fiord and Kangilo Fiord (Figure 1). Photographs have been read with a combination of autodetection using Artificial Intelligence to separate any photographs with potential whales, and then manual reading of all of those photographs and a subset of those identified as having no whales. Survey data is currently being analysed using a strip analysis for transects. Surface estimates will be adjusted to account for availability bias using dive data from narwhals satellite tagged previously.

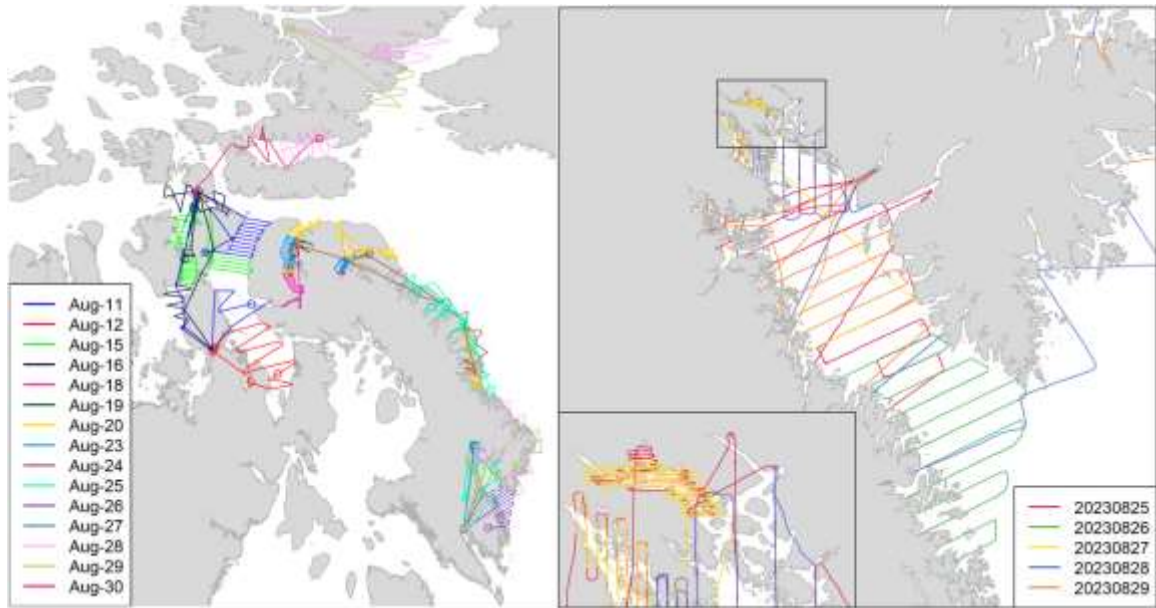


Figure 1. Map of realized survey tracks.

## 9. Reporting to Communities/Resource Users

In person meetings to consult on survey design occurred in Pangnirtung, Qikitarjuaq, Arctic Bay, and Clyde River. Email consultation occurred with Hunters and Trappers Organizations in Pond Inlet, Resolute Bay, Taloyoak, and Grise Fiord. All HTOs were sent email updates during the survey, and a field report and a poster following the survey. In-person meetings to follow up on how the field season went occurred in Pangnirtung (October 2023), Taloyoak (January 2024), Arctic Bay (February 2024), and Pond Inlet (June 2024). Further consultation on results will follow pending peer review.

## Final Financial Report to NWMB – September 2024

1. **NWSF Project Number:** NWRT-2023-0000000007

2. **Project Title:** High Arctic Cetacean Survey 2023

3. **Project Leader:** Cortney Watt, Fisheries and Oceans Canada, 501 University Crescent,  
[Cortney.Watt@dfo-mpo.gc.ca](mailto:Cortney.Watt@dfo-mpo.gc.ca), 204-983-5103

Marianne Marcoux Fisheries and Oceans Canada, 501 University  
Crescent, [Marianne.Marcoux@dfo-mpo.gc.ca](mailto:Marianne.Marcoux@dfo-mpo.gc.ca)

4. **Original Project Budget:**

Item	Contribution
Community contracts	\$52800
Twin otter costs	\$47200

5. **Original Contributions:**

Organization	Contribution
NWMB	\$100000
DFO	\$540000
PCSP	\$1374936
SARA	\$150000

6. **Explanation of Changes:** NA

7. **Financial Report**

Budget Item	Budgeted	Disbursed	Variance
Community contracts	52800	33302.85	-19497.15
Twin otter costs	47200	66697.15	+19497.15
<b>Total</b>	<b>100000.00</b>	<b>100000.00</b>	<b>0</b>

8. **Explanation of Variances**

Due to issues for HTOs to find staff, weather days, etc. we only utilized \$33,302.85 towards community contracts. We used the excess funds towards twin otter costs.

9. **Carry-Over Request**

There is no carry over request.

10. **Verification of Information Provided**


I certify that this is an accurate statement of the Board project funds received and disbursed in accordance with the joint contribution agreement.

Corky Wheeler

---

Project Leader

Sawatzky,  
Chantelle

 Digitally signed by Sawatzky,  
Chantelle  
Date: 2024.09.17 14:47:59 -05'00'

---

Finance Department Signature