

NWRT Interim Project Report

1. NWRT Project Number:
3-13-28
2. Project Title:
Aerial survey to estimate the abundance of the Baffin Bay narwhal population
3. Project Leader:
Steve Ferguson, Research Scientist
Fisheries and Oceans Canada
501 University Crescent, Winnipeg, Manitoba
R3T 2N6
204-983-507
Steve.Ferguson@dfo-mpo.gc.ca
4. Summary:
An aerial survey was conducted in the Canadian High Arctic in August 2013 to obtain new abundance estimates for the Baffin Bay Narwhal and Eastern Arctic-West Greenland Bowhead Whale populations. Three planes flew a combined total of ~240 hours and surveyed most planned areas. Data analyses have begun; a preliminary analysis will be completed in March 2014 and final population estimates will be available in spring 2015.
5. Project Objectives:
The survey was conducted as planned without changes in the overall objectives or strategy. Weather conditions prevented all areas from being completely surveyed, but all high priority Narwhal areas were surveyed. Smith Sound, Fox Basin and outer Cumberland Sound were not completely surveyed because of weather. Each survey team consisted of three DFO staff and one or two trained Inuit observers. Representatives from local communities were invited to join the survey crews and individuals from Resolute Bay, Arctic Bay, Pond Inlet, Clyde River, Kugaaruk, Taloyoak, Hall Beach and Pangnirtung joined the survey at some point.
6. Materials and Methods:
Strata of high narwhal density areas were covered using systematic parallel transects with greater coverage (7-15%) than had been done in the past. Areas with lower densities of narwhals were covered with zigzag transects. The aerial survey was flown at an altitude of 1,000 feet using three deHavilland Twin Otter 300 aircraft, each equipped with four bubble windows (left and right front, left and right rear) and a large belly window. Four observers were stationed at the windows, with a fifth team member acting as a navigator and camera operator. Sighting data were collected by two observers stationed on each side of the aircraft using line transect survey methods. The data from fore and aft observers on the same side of the aircraft will be used as a means to estimate a correction factor for potential perception bias by comparing sighting rates. This will allow us to estimate the proportion of sightings missed by observers. The fifteen team members gathered at the Polar Continental Shelf Program base in Resolute on August 1st and began preparing the three planes for the survey. During the first two days, all observers were given extensive training sessions to familiarize them with the protocols and prepare them for data collection. These

sessions included classroom presentations, on-the-ground training and practice flights around Resolute, which also allowed testing of on-board equipment.

7. Project Schedule:

Output or step	Start date (dd/mm/yyyy)	End date (dd/mm/yyyy)	Person days
Planning and organization	01/04/2013	01/07/2013	1200
Aerial survey	15/07/2013	31/08/2013	390
Data analysis	01/09/2013	06/30/2014	540
Science advice	01/09/2014	31/03/2015	40

8. Preliminary results/discussion:

Dates for the survey were established based on the short window of relatively ice-free waters in the Arctic Archipelago and the timing of narwhals aggregating on their summering grounds (i.e., before end-of-summer movement amongst areas is believed to occur). All three survey aircraft were initially based in Resolute. The first two days were scheduled for gear set-up and observer training, including test flights. The sequence of stratum coverage was designed to survey areas in order of priority, weather permitting. In an effort to avoid the effect of potential significant movements of narwhals between areas, attempts were made to survey each stratum in one or two days. For large or remote areas, this often required the use of more than one aircraft (e.g., the large Prince Regent Inlet stratum was surveyed in one day using all three planes simultaneously).

The 2013 summer was characterized by a late ice break-up, which placed additional constraints on the timing of surveys. At the beginning of the survey period, several areas were still completely (Norwegian Bay, Peel Sound) or partially (Jones Sound, Barrow Strait) covered with ice. Contingency days were planned to allow for poor weather conditions (with a ratio of two bad days for each good day). In the end, the aircraft were able to survey in adequate conditions for about 40% of the time. Weather conditions deteriorated towards the end of the survey period. Some areas were characterized by poor weather (strong wind and thick fog) during the entire month (e.g., Smith Sound).

Processing of the survey data began in fall 2013. Data processing steps include data assembly and verification, as well as using photographs to verify uncertain sightings and counts of large groups that were observed in fiords. In early 2014, the pre-analysis phase will involve assessing duplicate sightings amongst observers, time-in-view calculations, and plotting whale sightings. Additional analyses will be undertaken to improve the accuracy of the stock assessments, including re-analysing dive times from telemetry data to improve availability adjustments (e.g. sightings made in fiords rather than offshore). Separate projects will develop conventional and citizen science approaches to analyzing the thousands of photographs to come up with an independent abundance estimate.

An initial assessment of the survey results will be completed in Spring 2014. A complete assessment and primary publications will be completed in 2014-2015.

9. Reporting to communities/resource users:

Community / HTO	Before research	During research	Completion of research
Arctic Bay	January 2013	August 2013	May 2014
Clyde River	January 2013	August 2013	May 2014
Gjoa Haven	January 2013	August 2013	May 2014

Grise Fiord	January 2013	August 2013	May 2014
Hall Beach	January 2013	August 2013	May 2014
Igloolik	January 2013	August 2013	May 2014
Iqaluit	January 2013	August 2013	May 2014
Kugaaruk	January 2013	August 2013	May 2014
Kugluktuk	January 2013	August 2013	May 2014
Pangnirtung	January 2013	August 2013	May 2014
Pond Inlet	January 2013	August 2013	May 2014
Qikiqtarjuaq	January 2013	August 2013	May 2014
Resolute Bay	January 2013	August 2013	May 2014
Taloyoak	January 2013	August 2013	May 2014

Interim Financial Report

1. NWRT Project Number:
3-13-28
2. Project Title:
Aerial survey to estimate the abundance of the Baffin Bay narwhal population
3. Project Leader:
Steve Ferguson, Research Scientist
Fisheries and Oceans Canada
501 University Crescent, Winnipeg, Manitoba
R3T 2N6
204-983-507
Steve.Ferguson@dfo-mpo.gc.ca
4. Original Project Budget:
Provide a copy of the original budget from the application approved by the NWMB. Line items can be explained or expanded on using footnotes.

Item	Funds (\$K) (1 st year)	Funds (\$K) (2 nd year)
Survey flights	\$888	
Hotels	\$143	
Travel	\$152	
Local contracts	\$27	
Southern contracts	\$17	
Shipping	\$25	
Data analysis	\$175	\$200
Equipment	\$35	
CSAS meeting		\$25
Total	\$1,462	\$225

5. Original Contributions:

Funding Source	Funds (\$K) (1 st year)	Funds (\$K) (2 nd year)
Fisheries and Oceans Canada	\$1,118	\$200
Government of Nunavut	\$20	
Nunavut Wildlife Management Board	\$75	\$25
Polar Continental Shelf Project	\$249	
Total	\$1,462	\$225

6. Explanation of changes:
The total budget did not change, but the amount of funding received from various sources did. Higher than expected funding was provided by Fisheries and Oceans Canada, the Polar Continental Shelf Program and the Government of Nunavut, and funding was not provided by the World Wildlife Fund.

7. Financial Report:
Provide a financial report using the below format.

Budget Item	Budgeted	Disbursed	Variance
Survey flights	\$888	\$776.26	\$111.74
Hotels	\$143	\$109.73	\$33.27
Travel	\$152	\$76.83	\$75.17
Local Contracts	\$27	\$67.52	-\$40.52
South Contracts	\$17	\$47.03	-\$30.03

Shipping	\$25	\$25.12	-\$0.12
Data analysis	\$175	\$60.50	\$114.50
Equipment	\$35	\$21.61	\$13.39
Total	\$1,462	\$1,184.60	\$277.40

Balance, if any, to be returned to NWMB: \$0

Balance, if any, to be carried over: \$0

8. Explanation of variances:

Provide a list of explanations of variances, if applicable.

Flight time and travel costs were lower than expected but more was spent on local and southern contracts than was budgeted. Some survey equipment was purchased in March 2013, in the previous federal fiscal year, which reduced the amount of equipment purchased in fiscal year 2013-2014. Contracts and casual appointments for data analysis prior to April 2014 are still being finalized; these costs will reduce the current balance considerably. At present, no funds are being returned to the NWMB, but this decision will be re-examined once the pending casual and contract costs are determined. If a balance is remaining, it may be carried over into the next fiscal year to help with ongoing analysis.

9. 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.

Project leader