Interim Project Progress Report to NWMB - January 2014

1. **Project Number: 3-13-29**

2. **Project Title:** Bowhead Whale Movements and Ecology

3. **Summary:** Satellite tagging of bowhead whale took place in Foxe in July 2013. Nine bowhead whales were fitted with satellite-linked position and dive recording tag. As of January 13, 2014, eight tags remains attached and continue to transmit, documenting movements in Foxe Basin, Prince Regent Inlet and Gulf of Boothia, and Hudson Strait. One hundred sixty skin/blubber samples (biopsy) were also obtained.

4. **Introduction:** Satellite tagging of bowhead whales in the eastern Arctic has made important contributions to our understanding of bowhead whale behaviour. Studies of bowhead movements and seasonal distribution have demonstrated that bowhead whales easily move large distances from wintering areas in Hudson Strait and Davis Strait to summering areas in Gulf of Boothia and Prince Regent Inlet. In combination with studies in west Greenland, this work has demonstrated that these bowheads appear to belong to a single population, segregated by age and reproductive class. The work has provided new insight into our understanding of bowhead whale behaviour and ecology that contribute to our overall understanding of the species. This project attempts to add to the data obtained from whales tagged in other summering areas by tagging in Foxe Basin and Cumberland Sound.

5. **Project Objectives:** The specific objectives of the proposed project were to: deploy satellite-linked position and dive recording tags on bowhead whales in northern Foxe Basin and Cumberland Sound; collect bowhead biopsy samples during the course of tagging work; collect location data from location tags for mapping of movements and seasonal distribution; collect dive data for analysis of surface time and depth, duration and frequency analysis; collect relevant information from local people regarding sightings, observations and knowledge of bowhead whales, during consultations with Hunters and Trappers Organizations and during field work, in order to contribute to overall information on local movements and to improve the strategy for the tagging work; map and analyze the movements of tagged whales; report on the progress of findings regarding whale movements and dive behaviour to funding organizations, and to local resource users.

6. **Materials and Methods:** The project design is similar to that approved in previous years. The field work took place in northern Foxe. Plans were made in consultation with the Igloolik Hunters and Trappers Association. The tagging crew consisted of a combination of scientific staff and local people. Local assistants were required to transport equipment, to drive boats, assist with tagging operations and camp logistics and provide advice based on local knowledge. Scientific staff provided instruction on tagging equipment and tagging methods used in the past. The field

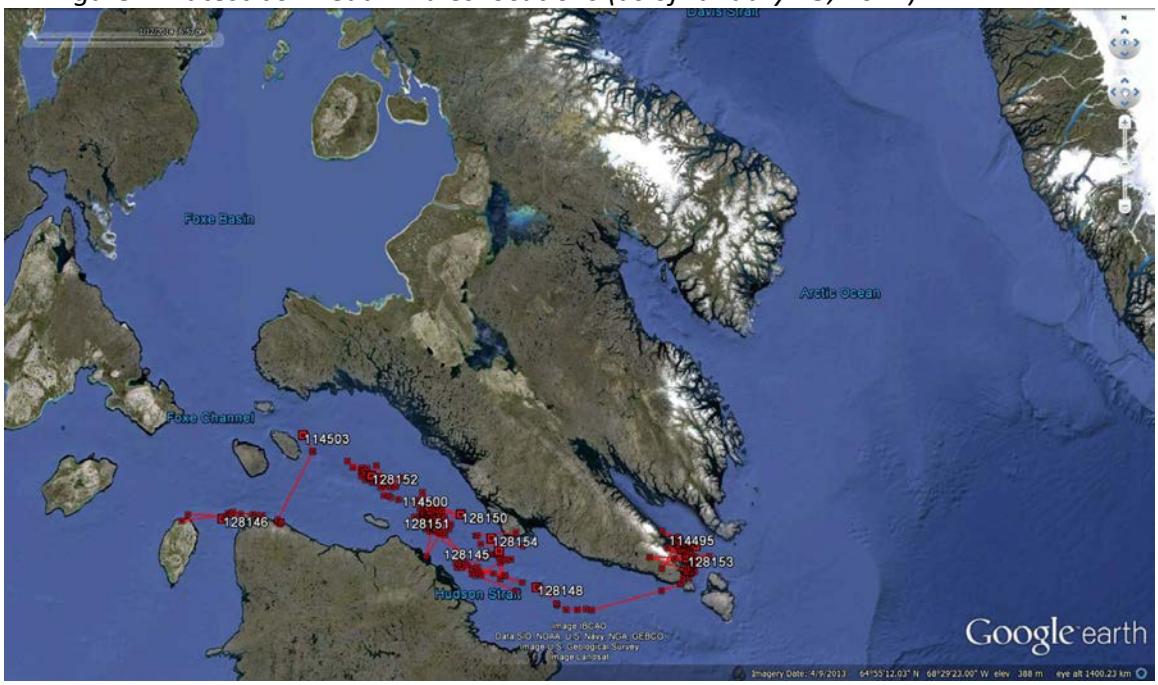
work was done in July, during the calm early summer season. Initial travel to the field sites required transport by boats, carrying tagging equipment and crew, camping gear and supplies. A minimum of two boats were used, and each is alternately used as the tagging boat or for providing safety support to the other boat. All tags are attached to the whales by means of an anchor, which is firmly implanted in the blubber using a hand-held pole. The anchor is composed of stainless steel, and is held in the blubber through a single small hole in the skin. During approaches, the person tagging the whale stands in the bow of the boat while the driver moves the boat close to the whale, typically approaching on the whale's right side. The other boat acted as a safety boat and to assist in keeping the whale from turning away from the tagging boat. Each time a whale is tagged, the following information is recorded by the field-workers: date, time and location; tag identity number and type; length estimate of whale; duration of the pursuit; group composition (how many whales and if there was a calf in the group) and any notes possible on behaviour before and after tagging. Skin samples, called "biopsies", are also obtained from bowhead whales during the field work. Biopsies are used for genetic analysis, which provides a method to determine the gender (male or female) of the whale. Biopsies are also used to study the relationships of whales with each other and with those from different regions. Two methods are used to collect biopsies. Biopsies are obtained when the whale is tagged, using a small biopsy tip attached near the end of the pole; this device removes some skin when the tag anchor is pushed into the whale. Other biopsy samples are taken by using a crossbow with arrows that have biopsy tips. After the whale is hit by the arrow, the arrow floats on the water with the skin in the biopsy tip. All the whale locations collected from the satellite tags are obtained on a monthly basis. After data processing and review, the data can be used in GIS mapping software to show all the recorded locations of whales as well as the tracks of movements. Detailed examination of the location data provides information on the range of individual movements, rates of movement, and potential areas of interest. Bowhead location data are also used in other studies to examine the habitat and potential affects of climate change in the Arctic ecosystem. By examining the locations of whales with reference to geographic region, ice conditions, and other physical environmental variables, the relationship between bowhead and habitat may be better understood. The importance of particular habitats to bowhead can be evaluated and protection to certain areas can be applied as appropriate. By understanding the relationship of bowhead to ice or other environmental features, the impacts of climate change may be better understood.

7. **Results:** Bowhead whale movements and diving behaviour are being collected from satellite transmitter uplinks. Eight of the nine transmitters deployed are still providing data (as of January 15, 2014). Dive data is yet to be analysed. The one tag that stopped transmitting provided locations for 13 days.
   Bowhead whales travelled through Fury and Hecla Strait to Gulf of Boothia within a few days after being fitted with satellite transmitters. Most whales stayed in the

Prince Regent Inlet/Gulf of Boothia complex from mid-July to mid-October. The first bowheads to initiate fall migration did so in the second week of October, moving south through the Fury and Hecla Strait. Towards the end of October, 2 bowheads moved out of their summering ground using the north route, exiting Prince Regent Inlet into Lancaster Sound. Those whales followed the east Baffin Island coast down to some late fall feeding grounds south of Home Bay. By early November, all bowheads have left Prince Regent Inlet/Gulf of Boothia complex.

As of January 13, 2014, all but one bowhead are located in their wintering ground in Hudson Strait (see Figure 1). That one whale is located at the mouth of Frobisher Bay.
Of the 20 bowheads that were fitted with a satellite tag in 2012 (NWMB project 3-12-02), 3 are still transmitting and providing valuable location and diving data.

Figure 1: Latest bowhead whales locations (as of January 13, 2014)



8. **Discussion:** The results are still being analysed but the dive results will add to other dive data obtained in previous years and will prove useful for survey estimate correction for diving animals.

9. **Management Implications:** These data are important to add to the further understanding of bowhead range and numbers in summer.

10. **Reporting to Communities/Resource Users:** Movement information is being sent to northern partners on a weekly basis. Final results will be reported to the local HTO, KWB, and NWMB as they become available.