

## Non-technical Project Summary Description 2020

**Project title:** Re-estimating the abundance of the Lancaster Sound (LS) polar bear subpopulation via genetic mark-recapture sampling

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**Research team members:** Four team members will participate daily per helicopter as there is only room for 4 people in the helicopter (there will be likely 3 helicopters, to be determined, each operating in a different section of Lancaster Sound), so at any given time there will be only 4 people at maximum in any of the parks. These people will be: the pilot, 2 biologists (likely contracted personnel) and a local HTO-designee to conduct the research work. This work will be done during the spring of 2021, 2022, and 2023 (April-June). Fuel caching will be done by a Twin Otter crew (To be determined) and cache clean up ongoing through the end of the project into summer of 2024.

### Project objectives:

The objectives of the field research project (2021-2023) are to:

- a) Work with community HTOs to design and implement a comprehensive survey using genetic biopsy sampling or genetic biopsy sampling in combination with selective collaring, to reliably estimate the abundance of polar bears in LS during the spring on-ice season (e.g., May – June) or semi-ice free season (during August to October) of 2021, 2022, and 2023.
- b) Estimate the current population size and composition of the LS polar bear subpopulation.
- c) Compare a new estimate of abundance with the one derived during a past study in-order to gain insight into population trend and status in LS, to the extent possible.
- d) Estimate survival and reproductive parameters (to the extent possible) in-order to facilitate population viability analyses.
- e) Evaluate on-ice or on-shore polar bear distribution (to the extent possible).
- f) Enhance public participation and provide HTO-designated personnel with training in survey methods and to ensure reliable surveying by including local ecological knowledge.

### Project Timing:

Duration: start fuel caching likely in August/September 2020, continue during March/April 2021, and begin field operations during April – June 2021. These activities occur also in 2022 and 2023. During 2024 we will attempt to clean the last remaining fuel caches during September. Specific dates cannot be determined at this time as we are planning with Polar Continental Shelf Program the caching; these activities also depend on when the fuel arrives in communities on sealift.

### Location:

A map of the entire Lancaster study area is provided in Appendix 1, including any planned fuel caches. Cache locations are not definite and have a little flexibility. The rough locations for Sirmilik National Park are N73.517 and W-82.712 (decimal degrees), and Qausuittuq National Park are N76.205 and W-100.016. Our research focuses predominately on the sea ice; very little time is spent at the fuel cache locations that are within the parks; we may spend a short time interval (1-2 hrs) to survey Qausuittuq NP, and likely less to fly along the shore of Sirmilik NP.

**Methods:**

The Government of Nunavut is planning to conduct a new population study (i.e., a research study) for the LS polar bear subpopulation with the objectives to obtain a new abundance estimate and up-dated demographic rates using less-invasive genetic biopsy sampling. In general, a genetic biopsy dart is fired from a helicopter and a small tissue sample is taken from a sampled bear without the need for immobilization of the animal. The sample then is used for genetic analysis to determine gender and identification of the animal. The survey will be flown during the spring (April – June) across the sea-ice. Because the study area is so large, and weather conditions are not great during the spring, we anticipate to have 3 field crews working in different areas across the study zone.

**Aircraft Access:** We anticipate approximately 70-80 hrs of fuel caching time by Twin Otter, and approximately 350 hrs of helicopter time to search for bears across our study area (Appendix 1) per year of study.

**Fuel Caching activity (anticipated):** In order for us to be able to conduct our ice-based polar bear study, fuel caches need to be available for re-fueling. The caches inside the parks are listed in Appendix 2.

**Benefits of Research:**

This research will be of benefit locally, regionally, nationally and internationally. This polar bear subpopulation has not been surveyed in over 20 years and the status of the subpopulation is unknown. Our research will aid in decision-making for management bodies that determine harvest levels. Moreover, we will be able to assess the status of this population and whether any changes occurred over the past decades as related to demographics and ecology. Lancaster Sound is an important polar bear population to residents where many bears are harvested for food and as sport hunts (e.g., economic values). Through this study, we will be able to include local HTO-designated personnel to demonstrate how research sampling occurs, incorporate local expert knowledge in daily planning and conduction of research, and ensure co-management partners are aware and included in research activities.

## Appendix 1

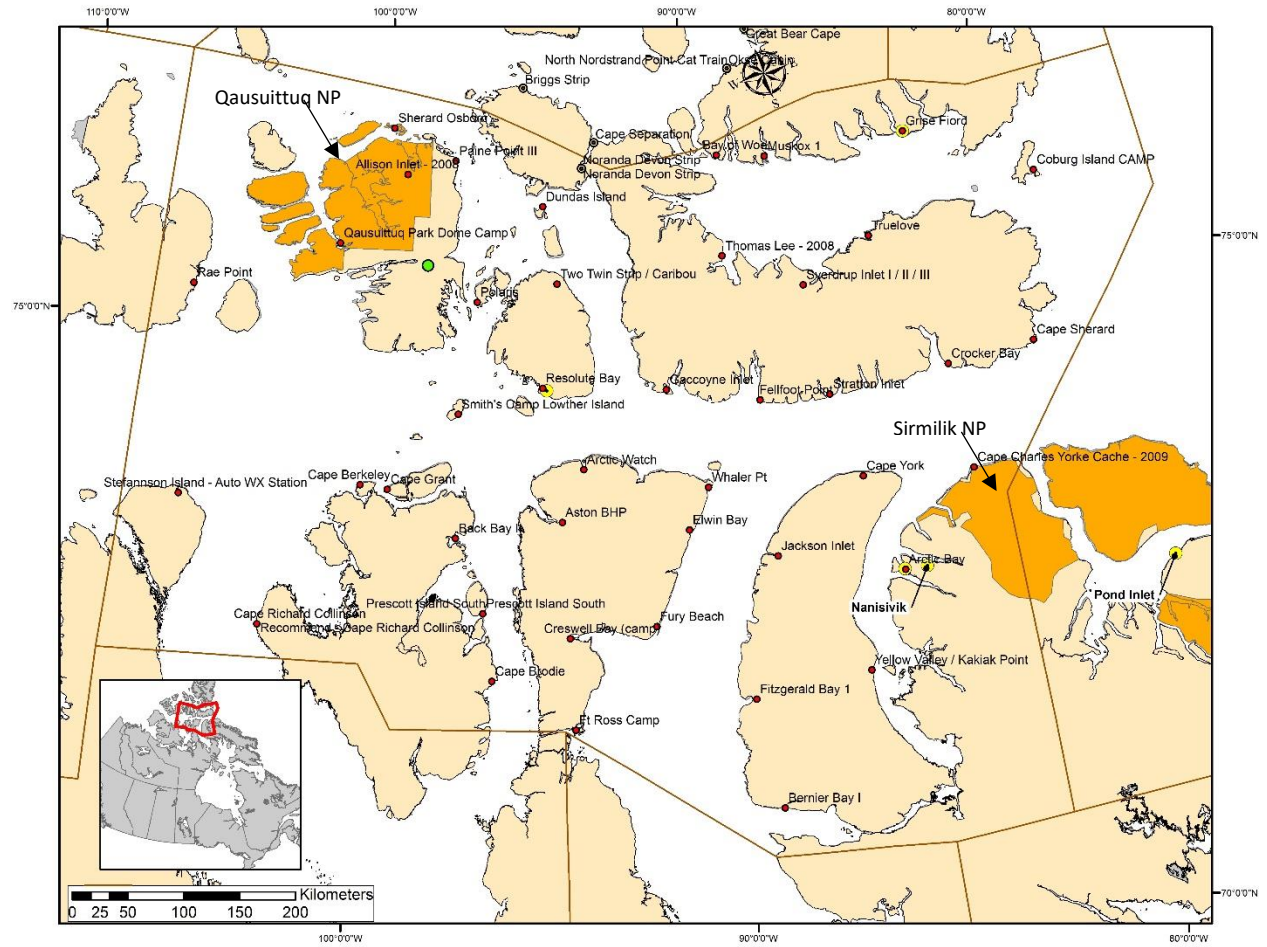


Figure 1. The Lancaster Sound polar bear study area with the two national parks outlined in orange.

Appendix 2.

Fuel cache name	Location	anticipated drums
<b>Cape Charles Yorke Cache - 2009</b>	<b>N73 43.831 W82 46.491</b>	<b>5 Jet B</b>
<b>Sherard Osborn</b>	<b>N76 43.180 W 99 47.190</b>	<b>5 Jet B</b>
<b>Qausuittuq Park Dome Camp</b>	<b>N75 48.050 W101 18.141</b>	<b>5 Jet B</b>