NUNAVUT WILDLIFE RESEARCH PERMIT APPLICATION

APPLICANT: Dr. Evan Richardson (Environment and Climate Change Canada)

ADDRESS:

UNIT 510 - 234 Donald St., Winnipeg, MB, R3C 1M8

PHONE:

Office: 780-863-5250

FAX: N/A

EMAIL:

Evan.Richardson@ec.gc.ca

SPONSOR(S):

Science and Technology Branch of Environment and Climate Change Canada

FUNDING SOURCES:

Environment and Climate Change Canada (ECCC)

ADDITIONAL LICENCES REQUIRED:

ECCC Western and Northern Animal Care Committee Approval

PROJECT TITLE AND RATIONALE:

Observations of polar bear habitat use and foraging behaviour in Navy Board Inlet/Eclipse Sound

TIME PERIOD:

May 01 - June 30, 2026

LOCATION:

Our research will be based out of Pond Inlet, Nunavut and occurs in the areas around

Bylot Island directly adjacent to the community.

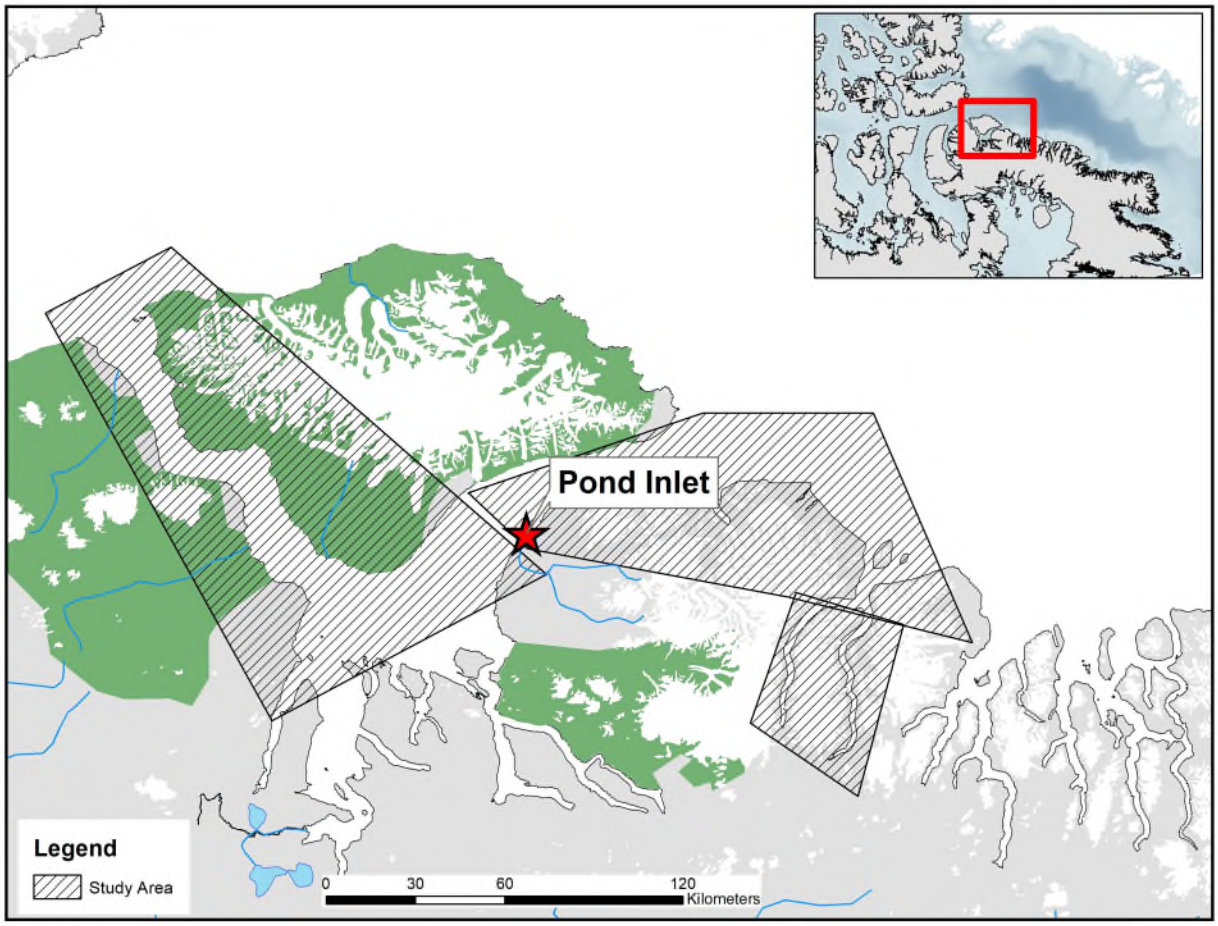


Figure 1. Study area of proposed research project.

SPECIES:

Polar bear (Ursus maritimus)

PROJECT LEADERS:

Dr. Evan Richardson (Polar bear research scientist, Environment and Climate Change Canada)

PROJECT PERSONNEL:

Jamie Enook (Wildlife Technician, Environment and Climate Change Canada)

David McGeachy (Wildlife Technician, Environment and Climate Change Canada)

Holly Gamblin (PhD candidate, University of Manitoba)

Brooke Biddlecombe (Post doc, University of Alberta)

Two local guides from Pond Inlet (individuals TBD)

OBJECTIVES: (Key expected results & Management implications)

The primary objective of this project is to work with local Inuit hunters in the community of Pond Inlet to observe polar bear habitat use and foraging behaviour in Navy Board Inlet/Eclipse Sound using tracking surveys and direct observations of bears. We will work with local guides to track bears through different types of sea ice habitat and make observations of polar bear foraging behaviour.

This research will quantify individual movement paths on the sea ice using fine scale movement GPS tracks and record individual foraging behavior to provide more refined estimates of energetic expenditure, energetic intake rates and first passage times for foraging polar bears foraging on the sea ice. To determine the extent to which individual bears either benefit or are impacted by interactions with conspecifics at kill sites we will perform a simple cafeteria experiment using hunter harvested ringed seals that are placed on the sea ice. Total available seal biomass will be estimated and observations will be made of time until detection (e.g. how long it takes bears to find a kill), detailed foraging behavior (e.g. preferential consumption of different tissue types), individual interactions, total number of bears foraging on a kill, foraging by other species (e.g. gulls/foxes) and time until the kill is completely consumed. This project was scheduled to last for three years starting in May of 2020 but will be extended to June 2026 because of difficulties in achieving suitable samples sizes for comparison on foraging dynamics between different age and sex classes of polar bears.

In addition to seal kills we will also opportunistically utilize narwhal carcasses from Inuit hunters if encountered on the sea ice. Pieces of the carcass will be weighed and trail cameras will be setup around the carcass to record scavenging activity.

To evaluate the drivers of seal detection on the sea ice, we will deploy experimental stations in Pond Inlet during the 2026 field season following similar methods to the carcass kill site deployments in 2018, 2019, 2022, 2023, 2024, and 2025. We will compare species detection rates (number of scavenging events per day) across four different station types: stations with (1) auditory cues, (2) visual cues, (3) olfactory cues, and (4) control sites with nothing present. We will establish a minimum of five of each station type for a total of 20 stations. Auditory cues will be simulated with squawk boxes (Margo Supplies, High River, Alberta) set to project gull noises. Black contractor bags filled with ice will be used to mimic the appearance of a seal for the stations with visual cues. To create stations with olfactory cues, we will use an auger to drill holes into the ice and place chunks of seal meat/blubber in the holes. The holes will then be covered with snow to remove visual cues. To test whether polar bears use auditory cues in addition to olfaction and visual observations we will deploy small audio speakers (squawk boxes) that will play back vocalizations of foraging gulls collected previously in this study. The stations will be deployed in our study area along with a paired trail cameras to see if bears are attracted to kills sites by gulls.

Our main objectives are to: (1) observe how bears of different age (adult/sub-adult) and reproductive classes (females with and without cubs) use different types of sea ice habitat, (2) examine how movements vary between different ice types (e.g. are movements more directional on smooth vs. rough ice), (3) to observe where polar bears most frequently successfully kill seals, (4) to study foraging ecology at ringed seal kills sites in differing sea ice habitats to evaluate the detection rate for polar bears of different age and sex classes as well as their interactions at a kill sites and (5) to

exchange scientific and traditional knowledge with local Inuit hunters.

METHODS: (i.e. Details of capture, handling, and disposition – *be SPECIFIC*)

The field team and two Inuit hunters/guides will establish a base camp on the sea ice from which daily trips will be made to track and observe foraging behaviour of polar bears near the floe edge in Navy Board Inlet/Eclipse Sound. All waste from the camp will be put into sealable drums and taken back to town for disposal.

Bears will be tracked by snow machine, skis and by foot across the sea ice with assistance from local Inuit guides. Movements of bears will be recorded on handheld GPS units by following tracks on the snow and ice to examine fine scale habitat use of polar bears in different kinds of sea ice. All observations of hunting behaviour and seal kills will be recorded to determine where polar bear successfully killed seal in different types of sea ice habitat. Direct observations of bear behaviour will only occur at distances >300m with the use of spotting scopes and binoculars following consultations with Inuit guides. Data collected on bear habitat use will then we overlain with high resolution satellite imagery to gain a better understanding how fine scale sea ice conditions influence polar bear habitat use and foraging success. All data collected will be entered into a GIS and the data and maps will be shared with the Mittimatalik Hunters and Trappers Organization.

To examine polar bear resource use and competition at kill sites we will deploy hunter harvested ringed seals along with motion activated cameras to observe foraging behaviour and use of kill sites by secondary scavengers. To evaluate variation in foraging behaviour between differing age and sex classes we will use up to 20 seals in our cafeteria experiment to obtain the sufficient sample size to examine individual level variation in foraging ecology and resource competition. Seals will be weighed to determine total available biomass and placed in areas of open ice to facilitate observations. Three - four Reconyx Hyperfire trail cameras will be deployed at each seal kill site, approximately 30 meters away from the kill to take high resolution photographs/video of polar bear foraging behaviour. Photographs will be reviewed to determine preferential consumption of primary tissues types (fat, muscle and viscera), intraspecific interactions at kills sites as well as to assess the importance of kill sites to secondary scavengers (e.g. foxes, Gulls, Ravens). Opportunistically we will utilize narwhal carcasses from Inuit hunters if encountered on the sea ice to assess scavenging dynamics by weighing carcass components and setting up trail cameras. Drones will be used to help ensure sites are safe to approach and no bears are present or hiding in rough ice near bait sites. To test whether polar bears forage exclusively from olfactory/visual senses or if auditory cues are important we will deploy squawk boxes that produce audio sounds of gulls to quantify if bears are attracted to the area or not. Playback recorders with uploaded gull calls from previous scavenging sites will be broadcast on speakers. Visual observations and trail cameras will be used to observe bear responses to these audio recordings.

Tracking and foraging ecology data will be help inform our understanding of polar bear movements, energy intake, foraging behaviours and intra-specific interactions at kills sites. These values will then be used in dynamic energy budget models (see Molnar 2009), to determine if current estimates of polar bear movement rates, path tortuosity and first passage time accurately describe the energetic balance of free ranging polar bears on the sea ice (see Fauchald and Tveraa). **All observations associated with hunter killed seals will be conducted away from communities and away from known travel routes for hunters to and from the floe edge from Pond Inlet. All**

observations will occur a minimum of 3km away from travel routes, minimum of 3km from any tent camp, and a minimum of 20km from any community. All tracking data collected will be entered into a GIS and the data and maps will be shared with the Mittimatalik Hunters and Trappers Organization. Images, videography and notes on foraging behavior will also be made available.

Fauchald, P. and Tveraa, T. 2003. Using first-passage time in the analysis of area-restricted search and habitat selection. Ecology 84:282–288.

Molnár, P.K., 2009. Modelling future impacts of climate change and harvest on the reproductive success of female polar bears (*Ursus maritimus*). Ph.D. Thesis, University of Alberta.

Will there be fuel cached for this project (Yes / No): (if yes; give the number of drums, the location of the caches, and the dates of deployment /removal.)

No fuel will be cached for this project.

COMMUNITY CONSULTATION PLAN:

We met with the Mittimatalik Hunters and Trappers Organization about our project on January 22, 2026. The HTO was in support of our project and we have received a letter of support for our program. Jamie Enook will meet again with the board prior to the 2026 field season to ensure there are no additional questions or concerns with the research project. A planned consultation and research update will be organized for at a later date in 2026.

PROPOSED USE OF LOCAL KNOWLEDGE:

This project will directly use and benefit from the local knowledge of Inuit hunters and guides who will be participants in helping find and locate bears in Navy Board Inlet/Eclipse Sound. By establishing a small camp on the sea ice scientist and guides will be able to work together and share knowledge on polar bear behaviour to better understand both community and scientific knowledge perspectives on polar bear habitat use.

OPPORTUNITIES FOR LOCAL PARTICIPATION:

A minimum of two local guides will be hired full time for the duration of the field program (10-14 days) and will be paid for their services via individual contracts. We will provide gas/oil for snowmobiles, food and lodging for the guides for the duration of their contract. The Mittimatalik Hunters and Trappers Organization will be consulted about all hiring and recommend local appropriate community members to be involved.

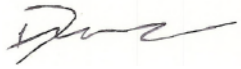
TERMS & CONDITIONS:

This application is submitted and will be evaluated prior to issuance of a Research Permit or Collection Licence, as issued by the Department of Environment – Wildlife Management Division, Nunavut Territory. All submitted applications become the property of the Department of Environment– Wildlife Division and

may not be returned to the applicant.

The application review process requires that copies be distributed to a number of reviewers. The contents of this application form may be subject to access under the Freedom of Information and Protection of Privacy Act.

Principal Researcher's signature — January 26, 2026 Date



Additional Investigator's signature — February 26, 2026 Date

Additional Investigator's signature — February 26, 2026 Date

RABIES ADVISORY:

Rabies is naturally occurring disease that is endemic to wildlife, particularly canids, in Nunavut. Rabies can infect human beings, and if left untreated can cause death. All persons who may be exposed to rabies are strongly encouraged to obtain and keep updated a pre-exposure vaccination.
Dr. Richardson and Mr. McGeachy have up to date rabies vaccinations.

All applications for Wildlife Research Permits should be submitted to:

Wildlife Research Section
Department of Environment
Box 209, Igloolik, NU, X0A 0L0

Tel: (867) 934-2178
Fax: (867) 934-2190
Email: wildlife_research@gov.nu.ca

File size must be under 5MB when sending application via e-mail. Please use multiple e-mails if necessary.