



## **NIRB Application for Screening #125467**

### **Eyes Above and Ears Below: Combining Technologies to Understand Killer Whale Vocal Behaviour, Group Composition and Distribution in the Arctic**

**Application Type:** New

**Project Type:** Scientific Research

**Application Date:** 5/10/2019 4:37:55 PM

**Period of operation:** from 0001-01-01 to 0001-01-01

**Proposed Authorization:** from 0001-01-01 to 0001-01-01

**Project Proponent:** Valeria  
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## DETAILS

### Non-technical project proposal description

English: There is some concern in the community of Pond Inlet about an increase in killer whales in the area. We are proposing to begin a study in Eclipse sound and surrounding inlets to learn about the killer whales that use the area. In particular, we would like to understand the links between their communication, behaviour and social relationships because this information may help us understand their distribution and presence in different areas. This is important, as changes in the presence and distribution of killer whales could have an impact on narwhal, which can in turn affect Inuit who have relied on narwhal for subsistence for thousands of years. The study would consist of taking pictures of the killer whale's natural markings to identify the groups of individuals, flying a small drone to film behaviour and verify group composition and group size, and record the groups with hydrophones. In this way, we will begin to find out if the different pods can be identified by the sounds each group makes which is something that has been very useful in other killer whale habitats in Canada. For example, on the west coast, people can monitor resident killer whales through the different sounds that each pod produces. Also, by learning about the sounds they make after capturing prey (these sounds have been shown to be very distinctive in other killer whale populations), the community can then monitor predation events simply by listening. This project is entirely non-intrusive (no tags of any kind). The hydrophones are small portable microphones that we can place in the water when we locate the animals, and that we connect to recording devices on the boat. They are entirely passive and make no noise. The drone is small, quiet, and flown high to avoid disturbing the animals. We used this combination of technologies successfully to understand beluga vocalizations and behavior in Cunningham Inlet, in Churchill, and in the St. Lawrence Estuary. This work will help the community to know what is happening with killer whales in the area. Youth researchers from Pond Inlet will be involved in all parts of the project and receive training to work with Elders, Hunters and researchers. Before the research begins, we organized, through our Ikaarvik program, a community information table at the Coop on June 1st, and two community workshops led by local youth in Pond Inlet, on June 2nd and 3rd, to hear community ideas and interests regarding killer whales and to develop research questions relevant to the community. Youth researchers, members of the Hunters and Trappers Organization, Parks Canada, hunters and Elders were part of this workshop. There was wide agreement that it is important for this project to go ahead because it gives the opportunity for Inuit to work together with scientists to learn more about killer whales in the Arctic and provides valuable training opportunities for youth to learn environmental monitoring. Collaboration with Parks Canada was established, and two camp locations, both within Sirmilk National Park, were identified (Navy Board Inlet, at 72.859 N, 80.543 W; and 72.3317 N, 78.7475 W).

French: Il y a une certaine préoccupation au sein de la communauté de Pond Inlet concernant l'augmentation du nombre d'épaulards dans la région. Nous proposons de débiter une étude au détroit d'Éclipse et dans les bras de mer environnants pour en apprendre plus sur les épaulards qui utilisent la région. Nous aimerions notamment comprendre les liens entre leur communication, comportements et relations sociales, car ces informations peuvent nous aider à comprendre leur présence et distribution dans différents secteurs. Ceci est important, car des changements dans la présence et la répartition des épaulards pourraient avoir un impact sur les narvals, qui peuvent à leur tour avoir une incidence sur les Inuits qui dépendent du narval pour leur subsistance depuis des milliers d'années. L'étude consisterait à photographier les marques naturelles visibles sur les épaulards pour identifier les groupes d'individus, à piloter un petit drone pour filmer les comportements et vérifier la composition et la taille des groupes et à enregistrer les groupes avec des hydrophones. Ainsi, nous commencerons à découvrir si les différents groupes (pods) peuvent être identifiées par les sons émis propres à chaque groupe, ce qui s'est révélé être une information très utile pour d'autres habitats d'épaulards au Canada. Par exemple, sur la côte ouest, les épaulards résidents peuvent être surveillés grâce aux différents sons produits spécifiquement par chaque groupe. De plus, en se familiarisant avec les sons qu'ils émettent après la capture d'une proie (il a été démontré que ces sons sont très distinctifs chez d'autres populations d'épaulards), la communauté peut suivre les événements de prédation simplement en les écoutant. Ce projet est entièrement non intrusif (aucune balise ne sera utilisée). Les hydrophones sont de petits microphones portables que nous pouvons placer dans l'eau lorsque nous localisons les animaux et qui sont connectés à des appareils d'enregistrement sur le bateau. Ils sont entièrement passifs et ne font pas de bruit. Le drone est petit, silencieux et sera piloté haut afin d'éviter de déranger les animaux. Nous avons utilisé cette combinaison de technologies avec succès pour comprendre les vocalisations et le comportement des bélugas à Cunningham Inlet, Churchill et dans l'estuaire du Saint-Laurent. Ce travail aidera la communauté à savoir ce qui se passe avec les épaulards dans la région. Les jeunes chercheurs de Pond Inlet participeront à toutes les étapes du projet et recevront une formation leur permettant de travailler avec les aînés, les chasseurs et les chercheurs. Avant que la recherche ne débute, nous avons organisé au travers de notre programme Ikaarvik, une table d'information communautaire à la Coop le 1er juin et deux ateliers communautaires dirigés par les jeunes de Pond Inlet le 2 et 4 juin afin d'entendre les idées et intérêts de la communauté concernant les épaulards et de développer des questions de recherche pertinentes pour la communauté. Les jeunes chercheurs, les membres de l'Organisation des chasseurs et des trappeurs, Parcs Canada, les chasseurs et les aînés ont participé à cet atelier. Il y a eu un large consensus sur l'importance que ce projet aille de l'avant car il offre aux Inuits la possibilité de collaborer avec des scientifiques pour en

Operations Phase: from 2019-08-11 to 2019-08-27

## Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Pond Inlet	Researching	Marine	N/A	N/A	Pond Inlet
Tremblay Sound	Researching	Marine	NA	NA	Pond Inlet
Eclipse Sound	Researching	Marine	NA	NA	Pond Inlet
Eclipse Sound	Researching	Marine	NA	NA	Pond Inlet
Eclipse Sound	Researching	Marine	NA	Na	Pond Inlet
Eclipse Sound	Researching	Marine	NA	NA	Pond Inlet
Navy Board Inlet	Researching	Marine	NA	NA	Pond Inlet
Milne Inlet	Researching	Marine	NA	NA	Pond Inlet
Tay Sound	Researching	Marine	NA	NA	Pond Inlet
Sirmilik National Park - One of the locations for our research camp with Parks Canada	Researching	Crown	This is a National Park located in Qikiqtaaluk, Nunavut, between Pond Inlet and Arctic Bay	NA	Pond Inlet
Sirmilik National Park - The second location for our research camp with Parks Canada	Researching	Crown	Sirmilik National Park is a national park located in Qikiqtaaluk, Nunavut, Canada, established in 1999	N/A	Pond Inlet

## Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Pond Inlet	Joshua Arreak	Mittimatalik HTO	2019-04-14
Pond Inlet	David Quamanic	HTO	2019-06-03
Pond Inlet	Elijah Panipakosho	HTO	2019-06-03
Pond Inlet	Gamailie Kilukishak	N/A	2019-06-03
Pond Inlet	Several local Youth (Sylvia Pewatoalook, Brian Koonoo, Ena Maktar, Jamesie Itulu, Jefferson Killiktee, Andrew Arreak)	Ikaarvik	2019-06-02
Pond Inlet	Joshua Arreak	Mittimatalik HTO	2019-06-04
Pond Inlet	Eric Ootoovak	Mittimatalik HTO	2019-06-04
Pond Inlet	Carey Elverum	Parks Canada	2019-06-03

## Authorizations

Indicate the areas in which the project is located:

North Baffin

### Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	I wrote a letter to Mosha Cota to determine if we need to apply to the NRI.	Not Yet Applied		
Fisheries and Oceans Canada	I wrote to Dr. Steve Ferguson, who thought a DFO permit would not be required in my case. He suggested I contact Jenna Kayakjuak to verify this.	Not Yet Applied		
Parks Canada	Parks Canada has agreed to collaborate with us on this project. They will be providing boat and skipper, and I will be going out on their boat, and will train their staff on bioacoustics. Agreement was made verbally on June 4th, volunteer agreement will be signed shortly.	Active		

### Project transportation types

Transportation Type	Proposed Use	Length of Use
Water	Small boat	

### Project accomodation types

Temporary Camp

Other,

## Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Boat	1	20-25 feet	To access camp-site, and to look for killer whales and narwhal groups to record them.
Portable Small Hydrophone	1	10x10 inches	Recording the whales
Phantom 4 Pro Drone	1	355 mm diagonal	To film the whales from above

### Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	3	10	30	Gallons	For boat

### Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0	n/a We will bring drinking water from Pond Inlet	

# Waste

## Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Camp	Non-Combustible wastes	10 kg	Bring back to Pond	n/a
Waste disposal	Sewage (human waste)	insignificance	buried	n/a

## Environmental Impacts:

This is a small and non-intrusive research project conducted from a small boat, so the impacts are negligible. The impacts to the community of Pond will be positive in the sense that several local folk will be hired in various capacities, such as research assistants.

# **Additional Information**

**SECTION A1: Project Info**

**SECTION A2: Allweather Road**

**SECTION A3: Winter Road**

**SECTION B1: Project Info**

**SECTION B2: Exploration Activity**

**SECTION B3: Geosciences**

**SECTION B4: Drilling**

**SECTION B5: Stripping**

**SECTION B6: Underground Activity**

**SECTION B7: Waste Rock**

**SECTION B8: Stockpiles**

**SECTION B9: Mine Development**

**SECTION B10: Geology**

**SECTION B11: Mine**

**SECTION B12: Mill**

**SECTION C1: Pits**

**SECTION D1: Facility**

**SECTION D2: Facility Construction**

**SECTION D3: Facility Operation**

**SECTION D4: Vessel Use**

**SECTION E1: Offshore Survey**

**SECTION E2: Nearshore Survey**

**SECTION E3: Vessel Use**



## **SECTION F1: Site Cleanup**

## **SECTION G1: Well Authorization**

## **SECTION G2: Onland Exploration**

## **SECTION G3: Offshore Exploration**

## **SECTION G4: Rig**

## **SECTION H1: Vessel Use**

## **SECTION H2: Disposal At Sea**

## **SECTION I1: Municipal Development**

### **Description of Existing Environment: Physical Environment**

This project will have negligible impacts to the physical environment. The only impact could be engine noise from the small boat used to locate the killer whales.

### **Description of Existing Environment: Biological Environment**

This project will have no impacts to the biological environment. It will be purely hands-off and non-intrusive, so no animals will be disturbed.

### **Description of Existing Environment: Socio-economic Environment**

The project will hire Inuit youth as research assistants, in addition to a boat driver.

### **Miscellaneous Project Information**

This is a very small scale project, I (Valeria Vergara) would be the only researcher from out of province, and a couple of youth from the community of Pond Inlet would participate in all aspects of the project .

### **Identification of Impacts and Proposed Mitigation Measures**

No impacts are foreseen

### **Cumulative Effects**

None

# Impacts

## Identification of Environmental Impacts

		PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
<b>Construction</b>																										
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
<b>Operation</b>																										
Researching		-	-	-	-	-	-	-	-	-	-	-	-	-		-	P	-	P	P		-	P	-	-	-
<b>Decommissioning</b>																										
-		-	-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

## Project Location



## List of Project Geometries

- 1   polyline   Pond Inlet
- 2   polyline   Tremblay Sound
- 3   polyline   Eclipse Sound
- 4   polyline   Eclipse Sound
- 5   polyline   Eclipse Sound
- 6   polyline   Eclipse Sound
- 7   polyline   Navy Board Inlet
- 8   polyline   Milne Inlet
- 9   polyline   Tay Sound
- 10   point     Sirmilik National Park - One of the locations for our research camp with Parks Canada
- 11   point     Sirmilik National Park - The second location for our research camp with Parks Canada