

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).

▷ΔΛΝϚ: 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

[illegible]

Operations Phase: from 2019-08-13 to 2019-08-29

$$\Lambda \subset \mathbb{N} \triangleleft \mathbb{N} \xrightarrow{\sigma} \mathbb{N} \xrightarrow{\sigma^b} \mathbb{N}^c$$

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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

መረጃ ለፕሮጀክቶች ለሚሰጡ ልዩ ምርመራዊ ሪፖርቶች

የፕሮጀክት ስም	ሰው	የፕሮጀክት አይነት	የፍቃድ ቀን
ፕሮጀክት	Joshua Arreak	Mittimatalik HTO	2019-04-14
ፕሮጀክት	David Quamanic	HTO	2019-06-03
ፕሮጀክት	Elijah Panipakosho	HTO	2019-06-03
ፕሮጀክት	Gamailie Kilukishak	N/A	2019-06-03
ፕሮጀክት	Several local Youth (Sylvia Pewatoalook, Brian Koonoo, Ena Maktar, Jamesie Itulu, Jefferson Killiktee, Andrew Arreak)	Ikaarvik	2019-06-02
ፕሮጀክት	Joshua Arreak	Mittimatalik HTO	2019-06-04
ፕሮጀክት	Eric Ootoovak	Mittimatalik HTO	2019-06-04

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$a^{\dagger}r d^{ab} r^a \sigma^b \wedge c_n d n^e \Delta D \sigma d^{fb} D^c$ $\cap \cap \nabla^f \omega^c:$

North Baffin

$\epsilon \Delta t^{\alpha} j^c \wedge J^{\beta} e_D \dot{N} \nabla^{\gamma} r^{\delta} C D P L \downarrow^c$

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ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ	I wrote a letter to Mosha Cota to determine if we need to apply to the NRI.	Not Yet Applied		
ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ	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		
ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ ᐃᑦᐳᓂᓄᓇ	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	How often do you use this mode of transportation?	Length of Use
Water	Small boat	

Project accomodation types

Temporary Camp

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◀▷↳◀⁹⁶▷⁹⁶

Λ⁹δ^c Δ⁶ρ²ζ⁵ Δ⁵βCDσδγ²ζ⁵ Δ⁴ε⁵ρδ²π³ρ^c Δ³δCΔ^c, Γ^cδΔ²ρ³η^c, ζ⁵β⁶LC²ζ⁵, ρε²ρ^c Δ²ρ⁶ρ^cδ

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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

$\partial \partial \nabla \rho_{\mu} \rightarrow J$ $\triangleright^{\text{fb}} \rho^b \wedge \Delta^c$ $\triangleleft^c C_{\alpha}{}^{\text{fb}} \triangleright^{\text{fb}} C^{\dot{c}} \rightarrow$ $\triangleleft \triangleright^{\text{fb}} C \triangleright \sigma \triangleleft^{\text{f}} \sigma^{\text{f}} \rho^c$

ᠳᠤᠰᠡᠯ	ᠹᠪᠣᠮᠴᠢᠨᠠᠭᠦᠷ	ᠸᠶᠢᠲᠥᠵᠡ	ᠱᠠᠩᠬᠠᠳᠠ	ᠪ᠋ᠢᠨᠴᠠᠵᠤ	ᠱᠠᠩᠬᠠᠳᠠ	ᠳᠤᠰᠡᠯ
Diesel	fuel	3	10	30	Gallons	For boat

$\Delta L^{\epsilon_b} \quad \triangleleft^{\epsilon_b} C \triangleright \dot{L}^{\epsilon_b} \triangleright^{\epsilon_b}$

$\Delta^c \rightarrow C \dot{L}^{fb} \rightarrow D^{fb} C D \sigma \Delta^{fb} \Delta^{fb}$	$^{fb} \omega^{fb} \Delta \Gamma^{fb} C^{fb} C^{fb} \sigma \Delta^{fb} <^c$	$a P^c \Delta \Gamma^{fb} C^{fb} C^{fb} \sigma \Delta^{fb} <^c$
0	n/a We will bring drinking water from Pond Inlet	

$\triangleleft^b C d^c$
$$\Delta^b C d_{\sigma} \sim \Delta^q \sigma^q$$
[illegible]

$\Delta^{\epsilon} \cap \Gamma \triangleright C \dot{=}^C \Delta^b \triangleright^{fb} C \triangleright L \triangleleft^c$

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 11: Municipal Development

$\dot{L}^{\infty}_x \nabla \varphi \cap D^{1,p}_{\sigma}(\mathbb{R}^d) \subset L^{\infty}_x D^{1,p}_{\sigma}(\mathbb{R}^d)$: $\text{meas } D^{1,p}_{\sigma}(\mathbb{R}^d)$

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.

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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.

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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 .

$\Delta^{\text{fb}} \text{CD} \sigma^{\text{fb}} \Gamma^{\text{C}} \quad \Delta^{\text{b}^2} \text{CD} \Gamma^{\text{L}} \Gamma^{\text{C}} \quad \text{fb} \Delta^{\text{C}} \sigma^{\text{fb}} \Gamma^{\text{C}} \quad \text{C} \Delta \Gamma^{\text{C}} \Gamma^{\text{fb}} \text{CD} \sigma^{\text{fb}} \Gamma^{\text{C}} \Delta$

No impacts are foreseen

Cumulative Effects

None

Impacts

$\omega_{\Delta} \Delta^{\epsilon_b} C D \sigma^{\epsilon_c} r^c$ $\Delta \rho \cap \Gamma D C \dot{\sigma}^c \rangle^c$ $\Delta^b \rangle^{\epsilon_b} C D r L \downarrow^c$

[illegible]
$$(P = \langle b \rangle \Delta \langle p \rangle \cap \langle a \rangle \langle b \rangle^c, N = \langle b \rangle \langle p \rangle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \langle \langle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \rangle \rangle \rangle \rangle \rangle \langle \langle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \rangle \rangle \rangle \rangle \rangle, M = \langle b \rangle \langle p \rangle \langle \langle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \rangle \rangle \rangle \rangle \langle \langle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \rangle \rangle \rangle \rangle \rangle, U = \langle b \rangle \langle \langle \langle \langle \langle \langle a \rangle \langle b \rangle^c \rangle \rangle \rangle \rangle \rangle \rangle)$$

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

- 1 polyline Pond Inlet
- 2 polyline Tremblay Sound
- 3 polyline Eclipse Sound
- 4 polyline Eclipse Sound
- 5 polyline Eclipse Sound
- 6 polyline Eclipse Sound
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