

16 January 2019

Proj. No.: 307071-01148

Nunavut Research Institute
Box 1720, Building 959
Iqaluit, NU
X0A 0H0

Mosha Cote, Manager, Research Liaison

Dear Mr. Cote:

**Re: Permit Summary – Pond Inlet Marine Infrastructure Project
(Government of Nunavut) Permit Number #01-047-16N-M**

1. Introduction and Project Location

In the open water season of 2018, construction began on a small craft harbour (SCH Project) fronting the Hamlet of Pond Inlet in Eclipse Sound (Qikiqtaaluk Region). The SCH Project is a new construction that will support existing marine use with a protective harbour and a location for sealift delivery (Figure 1-1). In October 2017, the Nunavut Impact and Review Board (NIRB) issued a screening report which determined that the SCH Project did not require further review (NIRB File No. 17XN030).

Fisheries and Oceans Canada-Fisheries Protection Program (DFO-FPP) determined serious harm would result from the SCH Project and thus a *Fisheries Act Authorization* (FAA) application was submitted.

A component of the FAA was to design an Offset Plan to compensate for serious harm. It should be noted that consultation specific to the requirements for the FAA were held in Iqaluit in September 2017 with the Mittimatalik Hunters and Trappers Organization (HTO). The HTO do not feel that Arctic char will be affected by the construction of the facilities but are interested in participating in the Pond Inlet Offset Plan that is required as a component of the FAA. The FAAs have been issued (DFO-FPP, File #: 17-HCAA-00551) and the pre-construction field survey was conducted from between mid August and the first week of September 2018.

This letter provides a summary of the 2018 field activities that were conducted as part of a multi-year program. The work was conducted with a Nunavut Research Institute (NRI) permit renewal from field work conducted for the baseline assessments (Permit #01-047-16N-M). Project construction monitoring (which includes the FAA) is included in NPC File # 148432.

The information presented in this report is preliminary and has not been analyzed in its entirety. Further details will be provided to the NRI as they become available through reports generated for DFO-FPP through the offset monitoring period. All data collected as a part of the Offset Program can be shared with interested parties, and NRI will be notified if any content from the Offset Program is published.

Construction of the SCH facility is ongoing and will continue in 2019.



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Figure 1-1 Project Location, Study Areas, and Nearby Watercourses



2. Research Team

The research team that was affiliated with the Iqaluit Offset Plan is as detailed in Table 2-1. Any questions associated with this Project can be directed to Victoria Burdett-Coutts (email: victoria.coutts@advisian.com; Phone: 778-945-5501) on behalf of the Government of Nunavut (contact Justin McDonell, email: jmcdonell@gov.nu.ca).

Table 2-1 Iqaluit Offset Plan Research Team

Name	Title
Victoria Burdett-Coutts	Lead Biologist
Diane Pinto	Community Engagement and Indigenous Knowledge Lead
Cameron Knight	Field Technician

3. Project Scope

The Pond Inlet Offset Plan consists of two components, the Monitoring Program, and the Research Program. The goal of the Monitoring Program is to assess the habitat characteristics within the footprint of proposed projects. In future years, after construction of the SCH, this will be compared to the habitat provided by the boulders/rocks that are a component of project design for shoreline protection. Rocks provide multi-dimensional habitat where marine organisms can find refuge in the spaces between them. The goal of the Research Program is to investigate the primary prey species of Arctic char in Eclipse Sound surrounding the proposed SCH.

4. Methodology

The field work components of these two programs, a summary of methodology and the dates that they occurred are provided in Table 4-1.

An Intertidal survey was conducted on the shoreline fronting the Hamlet (see Figure 4-1). Subtidal surveys were conducted within and outside of the proposed facility footprint (see Figure 4-2).

The habitat map that was generated from the Project Baseline Program (Advisian 2017) was georeferenced and used in the field on an iPad using the AvenzaPDF program.

**Table 4-1** Field Components for the Pond Inlet Offset Plan

Component	Activity	Methodology	Survey Date 2018
Monitoring Program	Intertidal surveys conducted at low tide in the footprint of the SCH and at a nearby reference site.	Intertidal surveys were conducted at low tide, with a Transect Survey and a Quadrat Survey. Transect Survey: Nine transects were conducted Field personnel documented habitat characteristics (substrate, organisms) and took GPS positions for future reference.	August 19
	Subtidal surveys were conducted at low tide in the footprint of the SCH and at a nearby reference site.	A local boat operator was subcontracted. The field team operated a remote operated vehicle (ROV) to provide video documentation of the habitat characteristics.	August 22, 28
		A local boat operator was subcontracted. The field team conducted SCUBA surveys to document the fish and fish habitat characteristics.	August 23, 25, 26, 29
Research Program	The intention had been to purchase 15 Arctic char from local harvesters in proximity to the proposed SCH. 15 fish could not be obtained as local harvesters were no longer fishing fronting the Hamlet. Advisian biologists were in Pond Inlet in late August which was when the fish had already returned to the river. One of the 15 fish were purchased.	There is no field work associated with this component, as fish were purchased from local harvesters. In the laboratory technicians will collected biological data from each fish (length, weight, sex, maturity status) and collect biological materials (otoliths, section of white muscle, stomach). The biological material was preserved in an appropriate manner for the analysis required and shipped to Vancouver, British Columbia (BC) for processing.	August 25
	An IQ workshop was conducted to integrate the extensive first-hand knowledge of local fishers—who have observed the environment and Arctic char on a continuing basis over decades—with scientific research. The goal of the IQ workshop was to determine habitat types (intertidal/subtidal) preferentially used by Arctic char in the marine environment.	The workshop included the participation of five currently active fishers selected by the HTO for being especially knowledgeable about arctic char and their environments. With the support of a local interpreter, large scale maps, photos, and a questionnaire were used to guide discussions. The workshop was not bound to any strict process and information was shared in the manner most comfortable for each participant.	August 27



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Figure 4-1 Pond Inlet Small Craft Harbour Intertidal Transect Surveys



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Figure 4-2 Pond Inlet Small Craft Harbour Subtidal (ROV, SCUBA) Transect Surveys



5. Results and Summary

5.1 Monitoring Program

Habitat characteristics within the footprint of SCH in Pond Inlet were confirmed in the intertidal and subtidal areas of Koojesse Inlet, using the habitat map from the Project. Transect locations are provided in Figure 4-1 and Figure 4-2.

5.1.1 Intertidal Surveys

Habitat characteristics surrounding the proposed SCH to be similar to those presented in the Baseline Report. The intertidal area has homogenous characteristics throughout and is primarily sand with some gravel areas. Photographs to demonstrate habitat characteristics are provided in Photo 5-1.

5.1.2 Subtidal Surveys

Remote Operated Vehicle

Subtidal habitat characteristics surrounding the proposed were confirmed to be similar to those presented in the Baseline Report. Subtidally, substrate was predominantly sand and gravel, similar to that in the intertidal. The exception to this was regularly distributed boulder patches, which had varying densities of seaweed. Seaweeds observed were largely rockweed, several kelp species (sugar wrack kelp, sieve kelp, ribbon kelp), and filamentous brown and red algae. There were no observations of marine invertebrates or fish during the subtidal survey. Photographs to demonstrate habitat characteristics are provided in Photo 5-2.

SCUBA

Subtidal habitat characteristics surrounding the proposed were confirmed to be similar to those presented in the Baseline Report and confirmed the observations made from the ROV Survey. Where divers were able to conduct a more quantitative survey, fish and invertebrates were observed. The most frequently and only fish species observed organism were sculpin. Invertebrates observed included; amphipods, sand tunicates, mussels, snails, limpets, and anemones. Photographs to demonstrate habitat characteristics and marine organisms observed are provided in Photo 5-3 and Photo 5-4 respectively.

5.2 Research Program

5.2.1 Fish

One of 15 fish samples were obtained, as it was determined the season for harvesting Arctic char had terminated earlier than when the field biologists had mobilized to Pond Inlet. Fish samples will be obtained from local harvesters in the 2019 open water season, with mid to late July being targeted. The fish was a male, 27.5 mm in length and weighed 9 lbs.

The tissue samples (stomachs, white muscle tissue) are being maintained in a minus 80 freezer and have not been processed at this time.



5.2.2 IQ

The following is a summary of the information obtained about Arctic char and their diet:

- Local fish caught in the area (other than Arctic char) include sculpin, arctic cod, sardines, salt water eels, and turbot (in very deep water). Salmon are also occasionally caught when passing through the area.

"Salmon are not from here but lay their eggs at the mouth of the Salmon river. Elders can tell the difference because Salmon have more fat and taste more like sardines".

- Participants stated that Arctic char can be found everywhere in the area and do not consistently stay in any specific type of habitat.

"It doesn't matter. Rocky, sandy, full of seaweed, it doesn't matter, they go everywhere."

"When Narwhals are around they tend to come in to more shallow water, when no narwhals they go deep."

"During low tide they are farther from shore in to the deep water, during high tide they come closer to shore"

- Participants weren't aware of any changes to Arctic char's diet while they're in the ocean. However, all participants (except for one) agreed that Arctic char's taste changes over the course of this time.

"When they first get in the water they don't taste very good. They are skinnier, not as fatty, and have a weird smell. Maybe they are eating something weird in the river or they are too hungry at first."

"They are definitely skinnier and not as fatty early in the season."

- Arctic char diet consists primarily of arctic cod (two types silver and black), capelin, sea butterflies, plankton, krill, and various amphipods.

"In the Salmon river there are many different kinds of amphipods – red and golden, orange coloured ones, all different kinds of plankton, they eat all sorts of amphipods"

- Participants weren't certain of whether Arctic Char diet changes depending on size of individual, but all believed that larger individuals tended to eat more fish compared to smaller individuals.

"Bigger char tend to catch more cods, but otherwise they all eat the same"

- Arctic char are observed feeding everywhere along the shoreline and at all observable depths.

"We've observed Char eating closer to the top, up and down the water depth, anywhere the fish are. We don't dive here so we haven't been able to observe them feeding on the bottom."

- When asked whether Arctic Char are caught in areas with vegetation, participants stated that the fish are caught everywhere, not just in areas with seaweed.

"We catch char everywhere, we catch them more around rocks but we're careful about not going near sharp rocks with our nets. In the lakes you find Char more around the rocks."



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Panel 1: Transect 1, Quadrat 4



Panel 2: Transect 2, Seaward View



Panel 3: Transect 5, Quadrat 1



Panel 4: Intertidal Beach Fronting Hamlet



Photo 5-1 Demonstrative Photos of Intertidal Habitat around the Hamlet of Pond Inlet



Panel 1: Transect 8



Panel 2: Transect 13



Panel 3: Transect 23



Panel 4: Transect 10



Photo 5-2

Demonstrative Photos of Subtidal Habitat Observed by ROV



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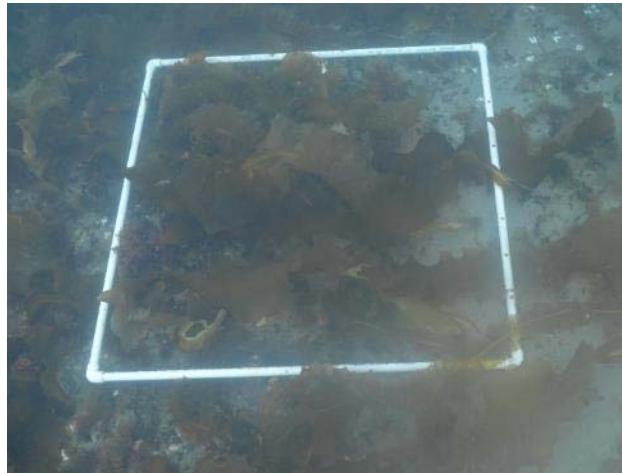
Panel 1



Panel 2: Transect 2



Panel 3: Transect 1, Quadrat 4



Panel 4: Transect 4, Quadrat 1

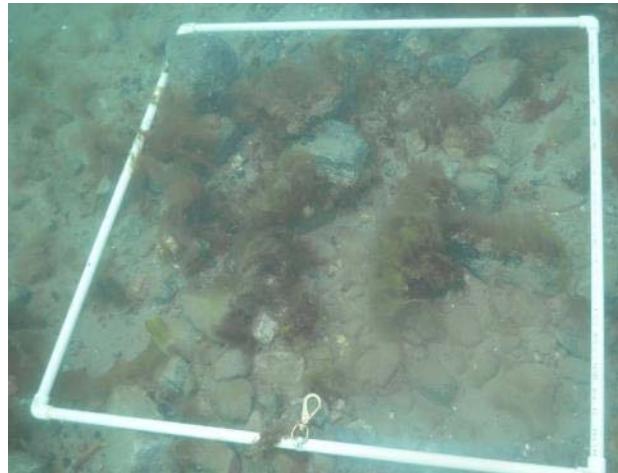


Photo 5-3

Demonstrative Photos of Subtidal Habitat Observed by SCUBA



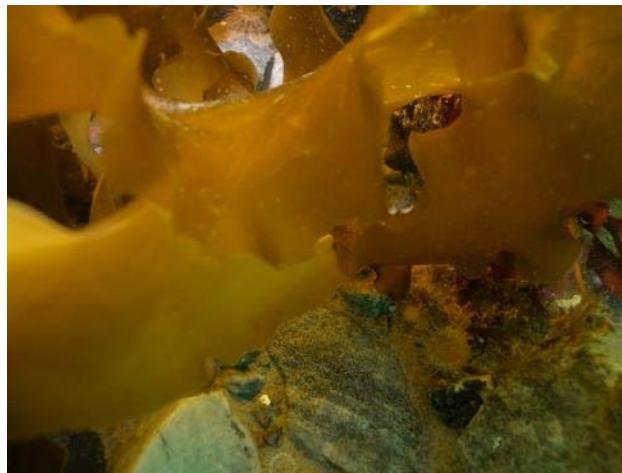
Panel 1: Egg mass



Panel 2: Sculpin



Panel 3: Sand anemone



Panel 4: Sea star



Photo 5-4

Demonstrative Photos of Organisms Observed by SCUBA



6. References

Advisian. 2017. Pond Inlet Marine Infrastructure Project. Marine Baseline Report. Prepared for Government of Nunavut. May 2017. (Document No. 307071-01148-01-EN-REP-0003, Rev.0).

7. Closing

We trust that this correspondence provides the necessary details required for our annual summary. To reiterate, any data collected over the course of this program will be available for interested parties. Publications on the subject, as they become available will be provided to the NRI.

If you require any further information, please do not hesitate to contact the undersigned.

Sincerely,

Victoria Burdett-Coutts, M.Sc, R.P.Bio
Marine Scientist, Environmental Consultant

Environment & Society - Canada
Advisian, Americas

cc:

Harald Kullmann, Advisian
Diane Pinto, Advisian
Paul Mulak, Government of Nunavut

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