

2019 NON-TECHNICAL ANNUAL REPORT – NRI LICENCE #02-056-18-R-M

1. Project Overview

Construction of the Pond Inlet Small Craft Harbour (SCH) (the Project) has been underway through two open-water seasons, initiating in 2018. Construction of these facilities is ongoing and will continue in 2020. Led by the Government of Nunavut (GN) - Community and Government Services (CGS), ownership and responsibility will transfer to the GN - Economic Development and Transportation (EDT) once operational. Pond Inlet is located on northern Baffin Island, on the southern shore of Eclipse Sound (see Figure 1 in Appendix 1). A schematic of the Project is available on the Nunavut Planning Commission or Nunavut Impact Review Board registry.

All necessary federal, territorial and municipal permits are in place. Field work pertinent to the Nunavut Research Institute (NRI) research license (Permit #02-056-18-R-M) has been ongoing since 2016 Table 1-1. The initial field work included the collection of baseline environmental and geotechnical data required to support permitting and engineering design. In 2018 and continuing through 2025 the field work includes monitoring and research programs to meet the Offsetting Plan requirements from the *Fisheries Act* Authorizations (FAAs) issued by Fisheries and Oceans Canada – Fish and Fish Habitat Protection Program (DFO-FFHPP). Section 4 outlines the field work initiated in 2018 and carrying on through to 2025.

This document provides a summary of the 2019 field activities that were conducted as part of a multi-year program and presents the plans for the 2020 field season. The information presented in this report is preliminary and has not been analyzed in its entirety. Data collected as a part of the field activities may be shared with interested parties upon request. NRI will be of publications resulting from the data collected.

Table 1-1: NRI Research Permit History

Year	Activities	Regulatory requirement for field program
2016	Environmental and geotechnical study to support baseline report for territorial and federal permitting	Nunavut Planning Commission (NPC) Project application, federal regulators (e.g. DFO) Inform engineering from geotechnical study
2017	No field work	--
2018	Pre-construction monitoring and Pilot Study research program 1 for the DFO FAA	DFO FAA
2019	Pilot Study Research Program 1 for the DFO FAA	DFO FAA

Year	Activities	Regulatory requirement for field program
2020	Year 1 for Arctic Char diet study (Research Program 1) IQ Program for Research Program 2	DFO FAA
2021	Year 2 for Arctic Char diet study (Research Program 1) Year 1 for Seaweed Habitat Study (Research Program 2) IQ Program for Research Programs 1 and 2	DFO FAA

2. Program Name

Pond Inlet Project Field Study

3. Proponent and Representative Details

Contact information for the proponent and representative are provided in Table 3-1 and for the field team are provided in Table 3-2.

Table 3-1: Proponent and Contact Information

Contact Category	Details
Name of Business / Company	Government of Nunavut – Community and Government Services (CGS)
Name of Proponent	Justin McDonell, Project Manager – Capital Projects Division
Proponent Mailing Address	PO Box 1000, Station 200 Iqaluit, Nunavut X0A 0H0 Phone: 867-975-5441 Email: JMcDonell@GOV.NU.CA
Name of Consultant / Primary Contact	Victoria Burdett-Coutts, Marine Biologist, M.Sc., R.P.Bio.
Consultant Mailing Address	Suite 500 - 4321 Still Creek Drive Burnaby, British Columbia V5C 6S7 Office: 778-945-5501 Mobile: 778-839-2372 Fax: 604-298-1625 Email: Victoria.Coutts@advisian.com

Table 3-2: Iqaluit Offset Plan Field Program Research Team

Name	Title
Victoria Burdett-Coutts	Senior Marine Scientist, Offset Project Manager
Diane Pinto	Community Engagement and Indigenous Knowledge Facilitator
Cameron Knight	Field Technician
Petra Stastny	Field Technician
Keila Stark	Graduate Student University of British Columbia (UBC)
Dr. Mary O'Connor	Graduate Advisor at UBC

4. Field Program

4.1 Program Scope

The Pond Inlet Offset Plan consists of a Monitoring Program (MP) and a Research Program (RP). Within the research program, two questions will be addressed, hereafter referred to as Research Program 1 (RP1) and Research Program 2 (RP2).

The goal of the MP is to assess the performance of the rip rap boulder which forms the shoreline protection for the facilities in terms of how it functions as fish habitat.

The goal of the RPs is to contribute to the biological knowledge base for subjects to which there is little known at a localized level, that are important to the Inuit people and to the scientific community. The topics addressed will be accomplished through a collaboration of science and Inuit Qaujimajatuqangit (IQ).

4.1.1 Monitoring Program

The goal of the MP is to confirm the ability of the rip rap boulder shoreline protection component of the facilities to function as fish habitat. Rocks provide multi-dimensional habitat where marine organisms can find refuge in the spaces between them or as attachment substrate for marine algae. Furthermore, it will provide foraging habitat for migratory fish including Arctic char.

The MP commenced in 2018 with a pre-construction survey (as described in the 2018 NRI submission [Advisian 2019]). Monitoring events will be conducted over three periods over a five years post construction from 2021 to 2025.

4.1.2 Research Program

The RPs will be undertaken as a collaboration between CGS, Advisian, and UBC. RP1 seeks to understand the diet and habitat preferences of Arctic char. RP2 seeks to understand the biomass and biodiversity of the seaweed bed in Eclipse Sound. Both RPs are composed of a scientific study, where a graduate student will be onboarded at UBC, complemented by an IQ study and meetings with the Mittimatalik Hunters & Trappers Organization (HTO). The IQ component will be facilitated by Advisian.

4.1.2.1 Research Program 1

The focus of RP1 is to investigate the trophic ecology and habitat requirements of anadromous Arctic char in Eclipse Sound.

Scientific Study

A pilot study was initiated in 2018 with the purchase of just 1 fish. There were no fish purchased in 2019 and the remaining 14 fish will be purchased during the 2020 field season.

A graduate student initiated their study at UBC in September 2019 and will conduct field programs in Pond Inlet the second to third week of July in 2020 and 2021. Representatives of the Mittimatalik HTO will be engaged to confirm that the timing planned is appropriate for peak season of Arctic char harvesting.

Diets of Arctic char will be assessed using a multi-pronged approach; analysis of stomach contents through deoxyribonucleic acid (DNA) barcoding for gut contents and lipid/fatty acid analysis of muscle tissue. The biochemical analyses may also be conducted on the primary prey organism of Arctic char species.

A minimum of 60 fish will be collected per year. Fish will be purchased from local harvesters. Primary prey species will be collected from the pelagic or benthic environment in proximity to the SCH. In the laboratory technicians will collect biological data from each fish (length, weight, sex, maturity status) and collect biological materials (otoliths, section of white muscle, stomach). The biological material was be preserved in an appropriate manner for the analysis required and shipped to Vancouver, BC for processing.

Inuit Qaujimaqatuqangit

The IQ component will use an ethnographic approach using a mix of related and established methods including: scoping and research design meetings with the Mittimatalik HTO; group workshops; individual interviews; field visits by key knowledge holders; archival research; and, verification meetings with the Mittimatalik HTO. The mix of methods helps to cross-check information and increases the overall reliability of study results. The inclusion of IQ will allow for a more robust understanding of Arctic char that is scientifically sound and connected to local experience, values, and priorities. An IQ workshop was conducted in August 2018. The purpose was to integrate first-hand knowledge of local Inuit fishers—who have observed the environment and Arctic char on a continuing basis over decades—with scientific research (described in Advisian [2019]).

Results and Summary

There was no IQ conducted for RP1 in 2019, and the results of 2018 can be reviewed in the 2018 NRI Summary Report (Advisian 2019). Laboratory sampling for the single Arctic char collected is currently underway. Laboratory results of the 2018 processing is not yet available but can be provided to the NRI or to the Mittimatalik HTO upon request.

4.1.2.2 Research Program 2

The focus of RP2 is to identify the biodiversity of seaweeds, and species associations with seaweed habitats in Eclipse Sound.

Scientific Study

The primary field season for RP2 will not occur until 2021 and will be conducted in conjunction with Post Construction Monitoring Year 1 of the Monitoring Program. Field methodologies are described in the 2018 CGS NRI Summary (Advisian 2018). There will just be one field season for RP2.

A drone survey was conducted by Arctic UAV on behalf of CGS in October 2019 targeting slack tide. This survey will be repeated in 2020 and will contribute to the habitat mapping exercise to be undertaken by the UBC graduate student. Onboarding of a graduate student for RP2 will not occur until September 2020.

Inuit Qaujimajatuqangit

RP2 will incorporate an IQ component consisting of a mix of ethnographic methods. The IQ Workshop was planned for 2019 but will occur in 2020 or 2021, and is expected to focus on IQ that is available for the species diversity of the seaweed beds, if the spatial extent or diversity has changed over time, and what is known about species dependencies on the seaweed. One interview was conducted in June 2019 with an elder identified by the Mittimatalik HTO to be the key knowledge holder and harvester in Pond Inlet of seaweed and other marine plants. Verification with this knowledge holder will be conducted during future visits for the IQ component.

IQ research in the following years may include individual interviews, field visits by key knowledge holders, archival research, and verification meetings with the Mittimatalik HTO. Should connections between the research occurring for RP1 be made (e.g. species living on or near rockweed/kelp are diet of Arctic char), these will also be included in the knowledge exchange.

Results and Summary

There are no results to present for 2019.

4.2 Plans for the 2020 Season

- Year 1 of RP1 to purchase and process 60 fish caught in and around the causeway on the western shore of Koojesse Inlet.
- No IQ plans for 2020 but the graduate student will check in with the Mittimatalik HTO to address any questions or concerns, to coordinate local field support and to assist with finding local harvester(s) for the fish collections.

5. References

Advisian. 2019. Pond Inlet Marine Infrastructure Project. Permit Summary – Permit No. 02-056-18-R-M. Prepared for Government of Nunavut. January 2019. (*Document No. 307071-01148-01-EN-LET-0001, Rev.0*).

6. Conclusion

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 may be available upon request for interested parties. Publications on the subject, as they become available will be provided to the NRI. If you have any questions or require further details contact information for Victoria Burdett-Coutts at Advisian is provided in Table 3-1.



Appendix 1 Figure

