

**NUNAVUT WILDLIFE RESEARCH TRUST FUND
FINAL PROJECT REPORT
2019/2020**

NWRT PROJECT NUMBER: 3-19-07

PROJECT TITLE: Pond Inlet Arctic Char Fishery Development Research Program

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SUMMARY

The community of Pond Inlet has been trying to redevelop their Arctic Char fisheries over the past few years. The local fishers have put in great efforts to collect biological samples in accordance with their exploratory fishing licence. Data the fishers' have collected will be used in a stock assessment analysis to provide managers, the Mittimatalik Hunters and Trappers Organization (MHTO) and the community with a stock status update. To support the fishers' data and provide a complete and well executed stock assessment analysis fishery independent baseline biological data is required. This research aims to work with the community of Pond Inlet to collect baseline biological data from two (2) Arctic Char stocks in the Pond Inlet area, as well as local knowledge and fishing practices on these stocks. Collectively this information will fill knowledge gaps on Pond Inlet Arctic Char fisheries and provide managers with more information to inform future decisions.

PROJECT OBJECTIVES

The objectives of this study were to:

- 1) Continue data collection that will be compared to historical data to determine the current status of the stocks. This data will support the already existing fishers' data and not be a duplicate effort;
- 2) Continue data collection for abundance estimate analysis (e.g. CPUE and catch information); and
- 3) Continue gathering local knowledge on Arctic Char fisheries in the Pond Inlet area (interviews and consults from past research will continue to be used as well).

Update on objectives:

- 1) We collaborated again with the Mittimatalik Hunters and Trappers Organization (MHTO) to execute the summer research plan. We successfully sampled the two (2) proposed locations for all catch and biological data with a team of local field assistants, knowledge holders and biologists.
- 2) We collected all CPUE and catch information from the summer research as proposed; and
- 3) We have applied the local Traditional Knowledge collected a few years ago to this research plan as suggested and supported by the MHTO.

MATERIALS AND METHODS

Field Data Collection:

Multi-mesh gillnets were used to collect catch-effort information and biological samples of Arctic Char at Koluktoo Bay and Satuut in 2019 near Pond Inlet, Nunavut. The sampling protocol outlined in VanGerwen-Toyne and Tallman

(2011) was employed. The use of multi-mesh gillnets permits sampling of Arctic Char of all sizes and ages. Location data such as position (determined by GPS), date, time of day, net depth, water temperature, weather, and other environmental conditions were recorded for each net set. To estimate catch effort, the net type, set time, lift time, and soak time was recorded. The fork length (mm), round weight (g), gonad weight (g), sex and maturity stage, ovaries from mature females, tissue samples, aging structures, and stomach contents of each fish were collected. To determine genetic structuring natal stock samples (juveniles) were collected.

Local Knowledge Gathering:

Interviews of local fishers were completed in 2014 (funded by NWRT) and this information has informed the current study. To continue the collaboration of local knowledge and science within this research the MHTO will be consulted and fisher interviews will continue for the duration of the project. The interviews are designed to be an open format with guiding questions relating to the Pond Inlet Arctic Char fisheries. All questionnaires will be approved by the MHTO and conducted in a face-to-face format in both Inuktitut and English. No interviews were completed this research year due to personnel limitations.

Data Analyses:

The data collected from this research along with the data collected by the local fishers (fork length, weight and sex) will allow for the assessment of the age and length structure, growth rate, sex ratio, physical condition, age-at-maturity, fecundity (egg-number-per-female), reproductive potential, mortality rates, and abundance estimates for these Arctic Char populations. The data analysis will involve a standard stock assessment protocol with age-based parameters and catch-curve based abundance estimates being presented.

Collectively, all the components of this research along with the fishers' data will feed directly into a stock assessment analysis which should provide managers with knowledge on the current stock status, document current fishing practices in the area and document local knowledge of the fisheries.

Training:

This research program hired a total of two (2) Inuit fishers to provide transportation and assist with fishing and data collection. All fishers were trained in DFO Scientific Stock Assessment Data Collection. An Inuit youth was also part of the DFO Scientific Stock Assessment Data Collection team. The youth was also afforded the opportunity to learn about general life of the land by the experienced Inuit fishers.

REPORT BY INUIT PARTICIPANTS

The Report by Inuit Participants have been handed out but not yet returned. We hope to speak with people when we are in Pond Inlet to collect their reports and

feedback to include in our final report to the NWMB and help us understand their report so we can meaningful respond to feedback with improvements to the project.

PROJECT SCHEDULE

The current project is on schedule to complete Koluktoo Bay on time (2020) but due to contracting issues last funding cycle and field sampling challenges, we are two years behind for completing of the data collection for Satuut. (NOTE: True at the end of 2019 but COVID-19 has changed that – will be reflected in next year's reports). We are planning to complete Satuut research in 2022. We are moving forward with plans to develop and propose a mixed-stock fishery analysis that is essential information to have when all Stock Assessment Research is complete. With the Stock Assessment Research, Traditional Knowledge and the Mixed-Stock Fishery Analysis we aim to provide a complete picture of the fishery as it currently stands in the coming years.

RESULTS/DISCUSSION/MANAGEMENT IMPLICATIONS

Field Data Collection:

Multi-mesh gillnets were used to collect catch-effort information and biological samples of Arctic Char at Koluktoo Bay from August 02 to 08, 2019 and Satuut from August 10 to 14, 2019. A total of 199 anadromous Arctic Char were sampled from Koluktoo Bay and a total of 70 anadromous Arctic Char were collected from Satuut. Length frequency histograms and maximum, minimum, and average size data are presented for these samples (Figure 1 and table 1). Juvenile Arctic Char from proposed natal stocks were collected to determine baseline genetic structure of each stock. Thirty to fifty (30-50) juvenile Arctic Char were captured using a variety of methods: small mesh gill nets, dip nets and seines. Whole fish were preserved and sent to the Freshwater Institute in Winnipeg, MB for analysis. Genetic samples taken by fishers and from the fishery independent survey will be compared to these natal stocks to determine how many stocks are contributing to the fishery, which stocks and at what rate.

Local Knowledge Gathering:

DFO met with the MHTO in May of 2016 and again in May of 2017. The MHTO was happy with our research plans and asked that we keep them updated by email. They were not interested in annual meetings; they have enough meetings at the moment and are happy with this research project. We have been in contact with the MHTO by email on an almost monthly basis and in person when field work was being conducted. We plan to meet with the MHTO and the community in the next funding year.

Funding year 2019-2020 covered year 4 of a 5 year project so we cannot provide discussions on the results at this time.

REPORTS TO COMMUNITIES/RESOURCE USERS

The 2019 results will be reported back to the MHTO via in-person meetings in 2020. DFO stayed in close contact with the MHTO and community during this past summer's research by in-person visits, phone calls and emails. Following our May 2018 meeting the MHTO stated that they were glad to see that we were planning to continue the work and provided DFO with multi-year support.

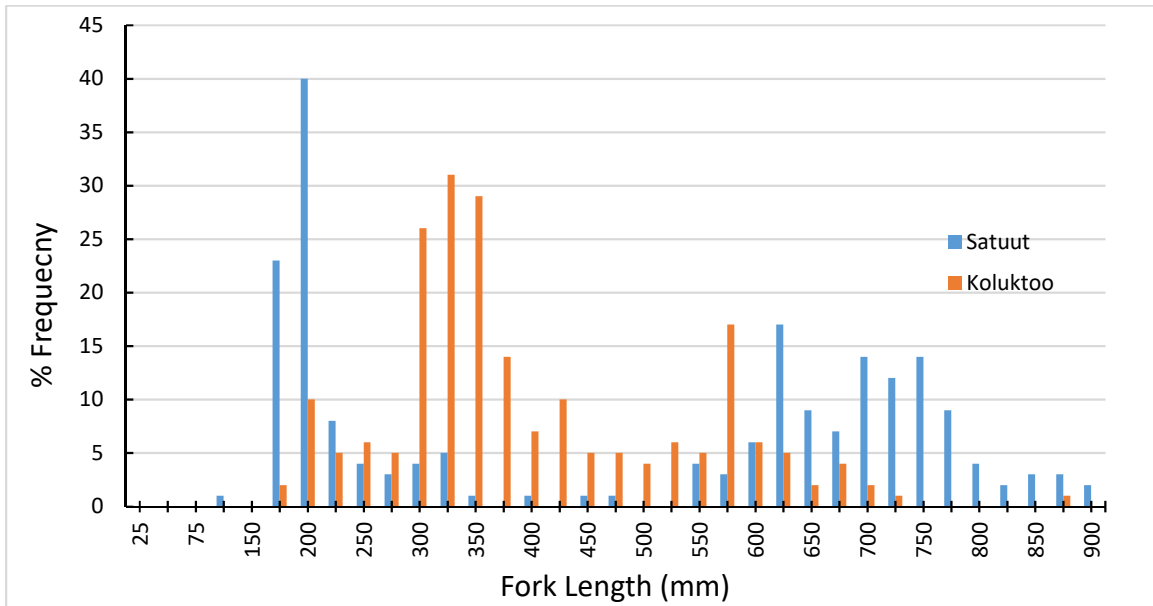


Figure 1: Length frequency histograms of Koluktoo Bay and Satuut Arctic Char collected from multi-mesh gillnet surveys in 2019.

Table 1. Maximum, minimum, and average lengths of Char caught in the 2019 fishing locations						
	<u>Maximum Fork Length</u>		<u>Minimum Fork Length</u>		<u>Average Fork Length</u>	
	(in)	(mm)	(in)	(mm)	(in)	(mm)
Satuut	35.1	892	4.8	122	18.5	470
Koluktoo	33.7	856	6.5	165	15.2	387

Table 1. Maximum, minimum, and average lengths of Char caught in the 2019 fishing locations

Table 2. Maximum, minimum, and average weights of Char caught in the 2019 fishing locations						
	<u>Maximum Round Weight</u>		<u>Minimum Round Weight</u>		<u>Average Round Weight</u>	
	(lbs)	(g)	(lbs)	(g)	(lbs)	(g)
Satuut	15.7	7112	0.1	39	4.6	2064
Koluktoo	12.6	5693	0.1	48	2.0	929

Table 2. Maximum, minimum, and average weights of Char caught in the 2019 fishing locations