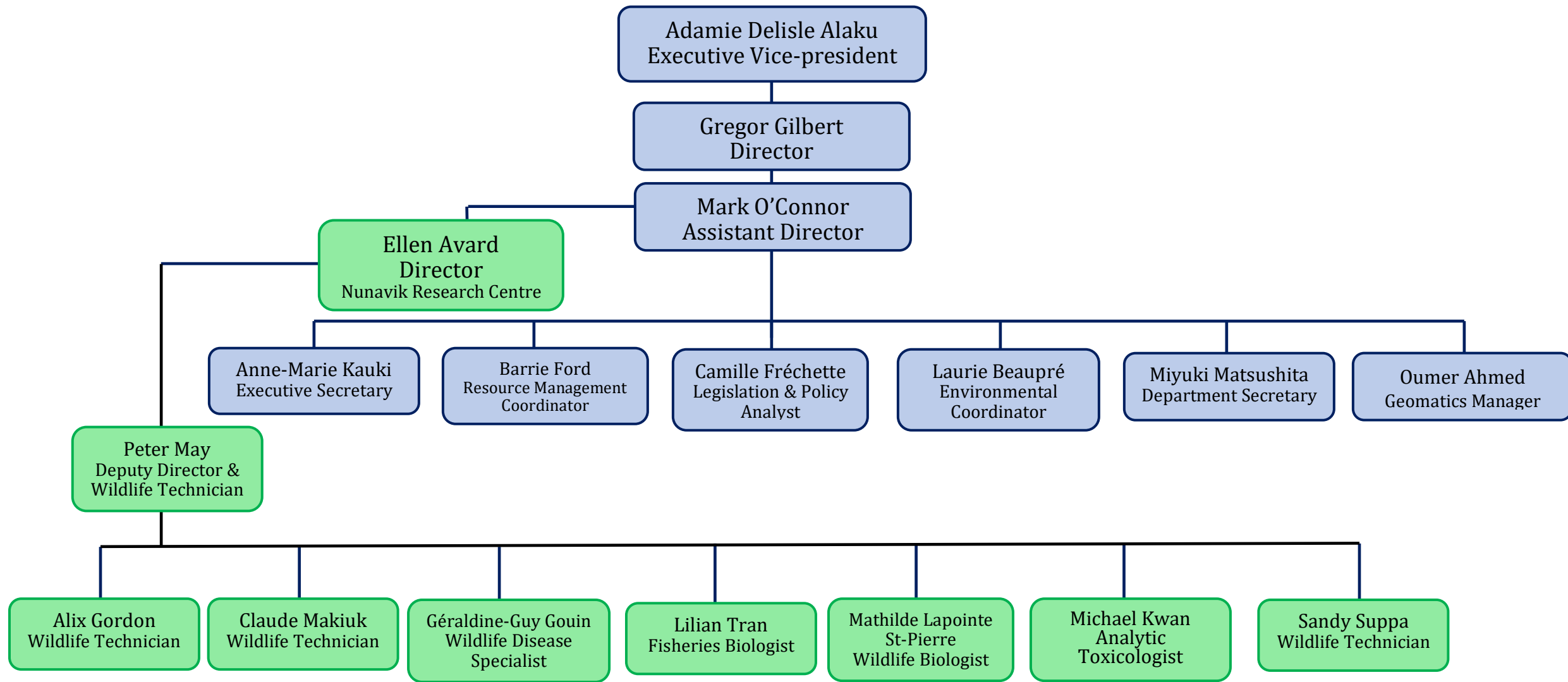


DEPARTMENT OF ENVIRONMENT,  
WILDLIFE AND RESEARCH:  
ACTIVITY REPORT

**Makivik Annual General Meeting,**

**April 26-30, 2021**

**Akulivik**



= DEWR

= NRC

## **Administration / Staff Changes**

- Mathilde Lapointe-St. Pierre has been hired and has started in the Wildlife Biologist position
  - She is based out of the Nunavik Research Centre in Kuujuaq
- Peter May has been promoted to Deputy Director of the Nunavik Research Center; he will also continue to carry-out his functions as a wildlife technician
- DEWR hired a consultant to conduct a strategic assessment of the department and make recommendations aimed at improving the department's structure and function. The final report has been delivered and discussions towards implementing improvements have begun

## **Land Claims Boards/Institutions**

### ***Hunting, Fishing and Trapping Coordinating Committee (HFTCC)***

- DEWR staff acts in support of the HFTCC members appointed by Makivik, namely Adamie Delisle Alaku, James May (Anguvigaq) and Markusi Qisiiq (KRG)

### ***Nunavik Marine Region Wildlife Board (NMRWB)***

- Makivik appoints three members to the board. They currently are Salamiva Weetaltuk, Vallee Saunders, and Harry Okpik
- The NMRWB board has nominated Iola Metuq to serve as chairman and is awaiting an official appointment by the responsible Ministers
- DEWR staff provides support to the Makivik appointees and input into NMRWB decisions on behalf of Nunavik Inuit

### ***Nunavik Marine Region Planning Commission (NMRPC)***

- The organization continues to work on the development of a Land Use Plan for the Nunavik Marine Region.
- Billy Dan May is chairman of the NMRPC, and Bobby Epoo and Charlie Alaku are the Makivik nominated members
- DEWR provides support and input to the Makivik appointed NMRPC members

### ***Nunavik Marine Region Impact Review Board (NMRIRB)***

- The NMRIRB continues in its mandate to screen and evaluate projects with potential social, cultural, and environmental implications for the Nunavik Marine Region
- Putulik Papigatuk chairs the NMRIRB and members nominated by Makivik are Peter May and Barrie Ford
- DEWR provides support and input to the Makivik appointed NMRIRB members

### ***Nunavik Inuit Land Claims Agreement Implementation Committee (NILCA IC)***

- The NILCA IC is responsible for ensuring that the NILCA is implemented to the satisfaction of the signatories; Makivik, the Government of Canada, and the Government of Nunavut, and that issues with the implementation of the agreement are addressed in a timely manner
- Gregor Gilbert is the Makivik member of the IC, supported by the legal department
- A new NILCA implementation plan has been negotiated and is expected to be implemented shortly. Makivik expects to see increased funding for the institutions established under the NILCA.

### **Food Security**

DEWR's involvement in food security discussion has grown in recent years, due to the obvious overlaps between food security in Nunavik and subsistence harvesting. This work often occurs in close partnership with other regional organizations (e.g. NRBHSS, RNUK, etc.) and includes participation to various working groups, collaboration with several researchers and input on funding decisions. Notably:

- Mark O'Connor has become involved in ITK's Inuit Food Security Working Group and has contributed to the development of the National Inuit Food Security Strategy. He will continue to be involved in regular meetings of this group and in implementation of the strategy.
- Mark has also become involved in the Inuit-Crown Partnership Committee (ICPC) table on food security, where these matters are discussed with the Federal Government.
- DEWR received funding in the amount of \$150,000 to lead a gap analysis and direct research into the impacts of climate change on food security. This work is ongoing.
- Makivik has received funding in the amount of \$2M to offset the impacts of COVID-19 on Inuit food security. As well, an additional amount of \$1.425M per year will be received until 2024. DEWR will assist Makivik in the allocation and use of these funds.

### **Beluga**

- The Minister responsible for DFO has varied the NMRWB final decision. The resulting beluga management plan is the first in many years to see quotas lifted for many communities.
- Despite this, Hudson Bay communities remain subjected to a strict quota. In other areas, DFO and the NMRWB will continue to monitor harvest numbers to ensure that the basis for their decisions (i.e. the degree of risk posed to Eastern Hudson Bay beluga) is not significantly altered due to the lifting of the quota. Should harvest levels rise significantly, their decisions may be reconsidered.
- The RNUK is working closely with communities to establish hunt plans aimed at providing access to beluga while continuing to address conservation concerns
- DEWR is monitoring the situation, allowing space for the Regional and Local Nunavimmi Umajulirijiit Katujjiqatigiinninga (RNUK and LNUKs, respectively) to carry-out their work and prepared to assist as needed
- DEWR is also in discussions with DFO to organize a beluga workshop in 2021 that seeks to foster knowledge exchange and discussion between stakeholders

## Caribou

### *Research*

- *George River Herd*
  - A survey of the herd was conducted in summer 2020 by the Newfoundland and Labrador and Quebec Governments
  - The herd was estimated at 8,100 caribou
  - There was a high proportion of calves in the herd (i.e. 35% of the population)
  - Overall: 24% increase compared to 2018, but adults are 27% less numerous than 2016
  - **Makivik Corporation continues to recommend that there be no hunting from the George River herd, as hunting continues to be the primary threat to this population**
  
- *Leaf River Herd*
  - No survey since 2016 (population estimate of 199,000 animals)
  - The herd is thought to have remained relatively stable last year (compared to 2018) at around 186,000 animals
  - Sport hunting of the Leaf River Herd ended in February 2018
  - A new survey is planned during July 2021
  
- *Torngat Mountains Herd*
  - A 2017 survey yielded a population estimate of 1,300 animals (vs. 1,000 in 2014)
  - A third survey was completed in March 2021, results are pending
  - An Inuit led Torngat Mountains Herd Traditional Knowledge Study is being planned
  
- *Species at Risk Act*
  - Consultations were conducted in 2019 concerning the possible listing of migratory caribou as an endangered species. Although Makivik has opposed the listing based on input from hunters, Canada's Minister of Environment and Climate Change has yet to render a decision
  
- *Nunavik Inuit Knowledge of Caribou*
  - With support from the Société du Plan Nord and WWF Canada, DEWR has completed an Inuit knowledge study regarding migratory caribou
  - A report is being finalized. It will be launched shortly, along with a best-practice guide and social media content
  - This work will form the basis for an Inuit-led caribou management plan to be developed in partnership with the Nunavik Hunters, Fishermen and Trappers Association beginning this year

## **Polar Bear**

### ***South Hudson Bay Polar Bear Decision***

- In October 2019, the federal court rendered a decision in Makivik's polar bear judicial review against the Minister of Environment and Climate Change Canada regarding South Hudson Bay polar bears
- The ruling was generally unfavourable to Makivik's position and raises serious concerns with regards to future applications of the NILCA management regime
- Makivik has filed for an appeal of this decision and recently, other Inuit regions of Canada have joined in our appeal. We are still awaiting a hearing date but are hopeful that it will occur in Spring 2021.

### ***Nunavik Polar Bear Management Plan***

- A working group consisting of representatives from Makivik, the RNUK, the Quebec, Federal, and Nunavut Governments, the wildlife management boards and the Cree of Eeyou Istchee has spent several years developing a draft management plan for polar bears.
- The Nunavik Marine Region-Eeyou Marine Region-Quebec Polar Bear Management Plan has been submitted to the relevant wildlife boards for approval. We are awaiting news on the structure of the decision-making process.

## **Outfitting**

### ***Mobile Camps Clean-up***

- In 2018 the Quebec government announced \$16.1M for the clean-up of nearly 300 mobile hunting camps that were left behind after closure of the caribou sport hunt
- Makivik sits on both a steering committee, which oversees program details, and monitoring committees which oversee approval of dismantlement projects
- 29 sites have so far been delegated to Makivik. A survey carried out in 2019 identified that there will be over 160 buildings to dismantle as well as nearly 200 fuel drums and other equipment to remove from the sites
- Some buildings are in relatively good condition and could be transferred to communities for the purpose of supporting subsistence harvesting.
- Work in summer 2020 was delayed due to COVID-19. A preparatory trip was made in Fall 2020 with a small team from Umiujaq and a supervisor from Kuujjuaq who selected and prepared the base camp for next year and started the clean up of 2 sites.
- Plans for 2021 remain uncertain due to ongoing travel restrictions, but it is expected that cleanup will occur.

### ***Right of First Refusal***

- The JBNQA provides Inuit with a right of first refusal to operate as outfitters. This right allows Inuit to step-in in place of the buyer of an existing outfitting operation, or the proponent of a new outfitting operation
- Because the right is set to expire in 2021, Makivik has been negotiating with Quebec to overhaul and renew the right of first refusal on a permanent basis
- Since full negotiations will not be completed before the 2021 expiration, an additional renewal, as-is, for a period of 3 years (until 2024) will be confirmed over the next months to provide additional negotiation time

## **Climate Change**

### ***National Inuit Committee on Climate Change (NICCC)***

- DEWR staff have continue to participate in the NICCC, specifically towards the implementation of the Inuit Tapiriit Kanatami (ITK) National Inuit Strategy on Climate Change Adaptation
- The Strategy as well as a high-level implementation plan was launched in June 2019
- The committee is now developing a specific action plan to guide the implementation of this plan

### ***Climate Change Preparedness in the North Program (CCPN)***

- In 2017 Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) launched a program that provides \$480,000 per year to climate change adaptation projects in Nunavik.
- The funding is allocated via a Nunavik Climate Change Committee (composed of Makivik, KRG and the RNUK, as well as government observers) evaluations
- Examples of funded projects include food preparation training, arctic char stream maintenance, the installation of VHF repeaters for marine safety, and polar bear safety training
- The committee accepts funding applications throughout the year

### ***Nunavik Climate Change Adaptation Strategy***

- Nunavik is at the forefront of climate change impacts and there is significant interest to study these impacts and to implement adaptation measures
- To date, there has been no guiding principle to direct these efforts
- Starting with a Climate Change Workshop in Kuujuaq during November 2019, DEWR is now leading a broad consultation with key organizations and businesses to identify regional priorities that will inform community consultations and help to build a Nunavik-specific climate change adaptation strategy that will be completed this year

### ***Inuit Guardians Program***

- DEWR secured funding totalling \$900,000 for the period of 2019-2022
- This funding has enabled a three-year partnership between DEWR and KRG's Uumajuit wardens program. And allowed KRG to hire their wardens as full-time, year-round employees

- In exchange, the wardens are expanding their mandate to monitor and study environment and wildlife to better understand the impacts of climate change on Nunavik
- The research program is currently under development and will include activities such as the monitoring of wildlife diseases, the range expansion of new species, and water quality
- This funding will also increase the capacity of communities to conduct regular monitoring of ice thickness and quality to ensure safe travel routes

### ***Community-Based Climate Monitoring***

- DEWR also secured three years of funding, totalling \$285,000, to conduct community-based climate monitoring
- This project is complementary to the Inuit Guardians project and will allow for training and purchase of scientific and field equipment needed to conduct effective monitoring
- Among the areas of interest for this project are monitoring the water quality of Arctic char streams and overwintering lakes and monitoring ice conditions

### **New Federal Impact Assessment Act and amendments to the Fisheries Act (Bills C-69 and C-68)**

- DEWR is involved with the Kativik Environmental Advisory Committee and the Naskapi Nation of Kawawachikamach in a joint, detailed analysis of Canada's new Impact Assessment Act and the tools it offers in terms of harmonization with the impact assessment processes arising from the JBNQA and the NILCA
- DEWR is also in contact with the Nunavik Marine Region Impact Review Board and the Planning Commission as part of such analytical work

### **Nunavik Regional Research Authority**

- In 2018, in response to increasing amounts of research which being done in Nunavik, representatives from Makivik and other Nunavik organizations developed a proposal for a regional, streamlined, and integrated research process, similar to those that already exist in other Inuit Regions
- Called Nunavik Regional Research Authority (NRRRA), it is still at an early stage. Following signature of a partnership agreement between Nunavik's regional organizations, a consulting firm was selected in August 2020 in order to take on the initial research, consultation and planning work that is needed to conceptualize the NRRRA and evaluate its financial and operational implications
- The six partner organizations, together with the Inuit Research Advisor for the region of Nunavik, are responsible for supervising the work of the consultants, which began last September and is planned to be finished by the summer 2021

### **Protected Areas – Offshore**

- Inukjuak received \$1.4 million dollars over three years to develop a proposal for a protected area for the Ottawa Islands. Makivik has been kept informed of the Inukjuak-led Arqviilit (Ottawa Islands) project and is looking forward to seeing further details



- Makivik fundamentally supports Nunavimmiut being able to dictate how their lands are to be used, including Arqvilliit

### **Fisheries Management Issues**

#### ***DFO new Arctic Region***

- In October 2018 DFO announced, as part of Canada's Inuit Nunangat policy space, the creation of a new administrative region (the new Arctic Region) that would be created for both DFO and the Canadian Coast Guard
- DEWR led Makivik's engagement with DFO regarding this new region including its role and structure within Nunavik, governance, etc. Makivik presented its vision for increased capacity by DFO within the region and the start of a new relationship between Inuit and DFO (operations are currently managed by the Quebec Region for Nunavik)
- In March 2021, DFO officially announced that Nunavik would be included in the Arctic Region. Details regarding the governance, structure and transition period are lacking
- DEWR will continue to be actively engaged on this file

#### ***Nunavut Fisheries Regulations***

- In 2018 DFO, Nunavut Tunngavik Inc. and the Nunavut Wildlife Management Board issued a joint statement signaling their intent to develop new fisheries regulations for the Nunavut Settlement Area
- Makivik has since been actively participating in the development of drafting instructions that will be used as the basis for the new regulations that we expect will be extended into the NMR, where several different regulations currently apply (including the Northwest Territories and Atlantic Fisheries Regulations)
- While a draft regulation was previously expected by December 2020, the COVID-19 pandemic has impacted the activities of the Nunavut Fisheries Regulations working group and a draft regulation should not be expected until mid-2021. More information can be found at <http://www.dfo-mpo.gc.ca/fm-gp/peches-fisheries/comm/consultation/nunavut-eng.htm>.

#### ***DFO Indigenous Habitat Participation Program***

- Due to Covid-19 considerations, DEWR was forced to decline funding in the amount of \$185,000 that had been secured from DFO that had been secured to develop capacity and mechanisms to ensure efficient and effective consultation with Nunavik Inuit.

### **Cartographic Services**

#### ***History of Nunavik Inuit Land Selection Atlas***

- Recently published an atlas of community land selection maps that describe the Inuit land selection process associated with the JBNQA and the challenges the Inuit faced during the four-year negotiations

- Currently working towards an online interactive version of the atlas containing 96 digital maps consisting of community selection maps and selection evolution maps, with descriptive summaries and explanatory notes

#### **Archiving historic land use and ecological maps 1970s to 1990s**

- Archival inventory was conducted to identify historic land use and ecological maps
- In total 966 hard copy maps were retrieved and repaired.
- Currently, all the maps are uniquely labelled and digitally photographed
- So far, 720 maps are currently stored in a good condition at the Montreal Center of Collections (CDCM) where Avataq has its museum reserve. The facility has humidity and temperature-controlled conditions which correspond to conservation standards.
- The digitally photographed maps are currently being georeferenced (georeferencing the photographed maps associates them with locations in true physical space).
- The inventory of our digital database is presently underway to identify previously digitized historic land use and ecological maps, text interviews and other related documents.
- A methodology was developed where the content of the existing Land Use database will be examined, organized and reattributed in a more user-friendly and up-to-date GIS format.
- The next step will be to digitize the georeferenced maps if they were not previously digitized (digitizing will convert the georeferenced maps to a digital map format)
- Using the collected data from this project ultimately individual hunter atlases will be produced and distributed to participant hunters or their surviving families

#### **Nunavik Inuit Knowledge of Migratory Caribou**

- Map based field interviews were conducted in 5 communities (Kangiqtualujjuaq, Tasiujaq, Salluit, Inukjuak and Umiujaq) using 23 maps
- After the completion of the field interviews the maps were georeferenced and digitized
- In the process more than 285 points, lines and polygons were generated
- In total 18 maps were produced to validate the information collected during initial interviews
- Final presentation maps will be produced for a report once the validation process is complete

#### **Mobile Camp Clean-up**

- Several camp site maps were produced displaying locations of 91 mobile hunting camps that have been delegated to Makivik for clean-up.
- The camp sites are located near the communities of Umiujaq, Kuujuaapik, the Tursujuq park boundaries and Lac Pau.
- The produced maps will be used to design the best work plan and estimate cost of transportation in terms of distances traveled to and from sites and communities.

### **Detecting beaver expansion using satellite remote sensing**

- The main objective of this project is to document the contemporary range of beaver populations along the western coast of Ungava Bay using satellite remote sensing
- Funding has been secured for this project from Climate Change Preparedness in the North Program (CCPN) totalling \$77,000 for the period of 2020-2023
- The funding will be used to acquire satellite imagery and to perform field data collection
- The current phase of the project includes the development of the research methodology and the acquisition of first-round satellite imagery

### **New website for land administration in NMR**

- Makivik owns 80% of the islands within the NMR and is responsible for the Entry and Access application process applicable to all non-Inuit, as per the NILCA
- The objective is to have a fully automated online Entry and Access system before the end of this year for better usage management and monitoring of the NMR islands

## **NUNAVIK RESEARCH CENTRE: Activities July 2020 – April 2021**

### **Contaminants**

#### **Project: Koksoak Fishery Study – Mercury in Fish**

- Fifty-four fish were collected in the fall 2020 from the Koksoak River for mercury analysis as part of the biannual mercury monitoring effort since the early 1990s:

<b>Species</b>	<b>Number of fish</b>	<b>Mercury levels, parts per million (ppm)</b>
Lake whitefish	21	0.056 – 0.287
Brook trout	20	0.069 – 0.318
Atlantic salmon	9	0.024 – 0.059
Round whitefish	2	0.194 – 0.229
White sucker	2	0.156 – 0.175

- Mercury levels in all fish were below the Health Canada’s safety guideline of 0.5 ppm; hence, they are safe for human consumption.

#### **Project: Mercury, Lead and Cadmium in Arctic charr from the Koroc River**

- 30 Arctic charr collected in the winter of 2020 from the Koroc River near Kangiqsualujjuaq were analysed for mercury, lead and cadmium. Lead and cadmium were not detected in any of the samples. Mercury levels were in the range of 0.022 to 0.165ppm with an average of 0.037ppm which is 13 times below Health Canada’s safety guideline of 0.5 ppm. Mercury levels of Arctic charr from the Koroc River are extremely low and do not pose a health risk to consumers.

- By and large, there is no difference in metal levels in Arctic charr between 2020 samples and those collected in the previous study in 2015.

**Project: PFAAS Exposure and Immune System and Respiratory Health**

- New project with Laval University in development.
- Plan is to sample water and soil around Kuujuaq.

**Paper: Mercury in Ringed Seals Relating to Climate Change**

- A peer-reviewed paper titled “Mercury in ringed seals (*Phoca hispida*) from the Canadian Arctic in relations with time and climate parameters.” was accepted by the journal, Environmental Toxicology and Chemistry for publication in July 2020.
- Mercury levels in muscles and liver of 1,500 ringed seals collected and archived for 45 years (1972 – 2017) from 23 Arctic communities together with climate parameters were examined. Close to 90% of seal samples were analyzed at the Nunavik Research Centre in Kuujuaq.
- Scope: The entire Canadian Arctic (Beaufort Sea, Central Arctic, Western and Eastern Hudson Bay, Eastern Baffin Island, High Arctic to Grise Fjord, Hudson Strait, Ungava Bay and the Nunatsiavut regions).
- Collaborators: Nunavik Research Centre (**Michael Kwan**); Environment and Climate Change Canada (Derek Muir, Magali Houde, Xiaowa Wang).

**Monograph: Predictive Models for Fish Mercury Levels Based on Fish Growth**

- A monograph titled “In Pursuit of Reliable Predictive Models for Fish Mercury Levels based on Fish Growth. Comparative Regression Modeling of Fish Mercury Data: Classical Frequentist Inference versus the Bayesian Approach, Bootstrapping and Iterative Simulations.” 156 pages by **Michael Kwan** was published in February 2020.
- Mercury and growth data of 260 fish (lake trout, brook trout, lake whitefish) collected for the environmental baseline assessment of the Innavik hydropower project at the Inukjuak River watershed in 2019 were used to develop statistical models with an attempt to predict fish mercury levels based on fish size and age.

**Report: Microplastics in Nunavik Coastal Waters**

- A report titled “Microplastic Contamination in Nunavik Coastal Waters: Methodology Development, Preliminary Survey on the Ungava Bay Coast and Community – Based Sampling – A Pilot Study.” by **Michael Kwan** was submitted in April 2020 to Oceans North who contributed \$15,000 to the study.
- The aim has been to develop and to test out methodologies and protocols and to construct specialized field and lab equipment for sampling and identifying microplastics in surface seawaters and beach sands collected from the Nunavik coast.
- The developed protocols and equipment will be used by the Uumajuit Wardens of the Indigenous Guardians Program as well as students from communities in the summer of 2021 for a wider scale of monitoring of microplastics along the Nunavik coast.

**Poster: 24 Years of Walrus Harvesting and Trichinella Diagnosis in Nunavik**

- A poster titled “24 Years of Walrus Harvesting in Nunavik and Trichinella Diagnosis at the Nunavik Research Centre (1996 – 2020)” by **Michael K. H. Kwan** was completed in November 2020. This will be submitted to ArcticNet for presentation in the fall of 2021.

- The poster summarized the harvest of close to 1,000 walrus by Nunavik communities over the 24-year period with respect to hunting locations and the occurrence of trichinella infection.
- On average, 3% of walrus harvested by Nunavik communities tested positive for trichinella infection. Based on the 24 years of data, a downward trend was forecasted for the occurrence of trichinella infection in the short-term future.
- The majority of trichinella infected walrus originated from the Southeastern Hudson Bay near Sleeper Islands (Qummiutait) and the Sanikiluaq archipelago.

## **Fisheries**

### **Project: Community-Based Monitoring of Arctic charr from the Nepihjee River System**

- Initiated in 1999 in collaboration with Nayumivik Landholding Corporation.
- Direct counting, measuring and monitoring of Nepihjee River Arctic charr to estimate the size of the population, understand size structure and growth over time, and track movement and migration patterns.
- NRC secured \$62,416.25 from the Indigenous Community-Based Climate Monitoring program for 2020-2021.
- Under this project, Laval University and University of Waterloo are specifically studying Arctic charr genetic origin/migration patterns and species growth, respectively.
- Summer 2020 monitoring was cancelled due to COVID-19.

### **Project: The Nepihjee River Arctic charr Fishway Restoration Project Near Kuujjuaq, Nunavik**

- Objective was to continue the minor restoration work initiated in 2019 by removing debris in the fishway to provide a clear path for Arctic charr to migrate upriver.
- NRC was successful in securing \$46,157.96 from the Climate Change Preparedness in the North program for 2020-2021.
- Restoration work was cancelled in September/October 2020 due to COVID-19.

### **Project: Kuujjuaq Hatchery**

- Over 40,000 juvenile Arctic charr were released into the Nepihjee River system in 2020.

### **Project: Deception Bay Arctic charr Monitoring**

- Biological data collection of the Deception River Arctic charr took place in summer 2016 and spring 2017-2019.
- A technical report is currently being prepared summarizing and interpreting all the data collected so far.

### **Project: Arctic charr Genetics Study (FISHES Genome Canada & BriGHT)**

- Collaboration with Laval University.

### **Project: Restoration and Protection of Fish Habitat Affected by Mining Activity in the North**

- Collaboration with MiraNor at INRS.

### **Project: Pink Salmon Tracking in Nunavik**

- Collaboration with MFFP.

**Project: Salmon Scale Reading**

- Contract for MFFP.

**Project: Atlantic salmon Genetics Study (FISHES Genome Canada)**

- Collaboration with Laval University.

**Project: Fuzzy Modelling of Arctic charr Habitat**

- Installation of monitoring equipment in collaboration with INRS and Uumajuit Wardens.

**Project: Koroc River Arctic charr**

- Biological data collection of Koroc River Arctic charr in collaboration with KRG Parks.

**Project: Qamutissait Arctic charr Monitoring**

- Ongoing monitoring of Arctic charr in Qamutissait (booklets, spring tags, etc.) with Nayumivik LHC.

**Program: Koksoak Fish Study (KFS)**

- Population and health monitoring of fish in the Koksoak River (booklets).

**Program: George River Fishing Booklets**

- Program development of fish monitoring in collaboration with LNUK and Qiniqtiq LHC.

**Program: Canadian Royalties Inc. Sportfishing Program**

- Ageing of fish from sport fishery in Bombardier Lake in collaboration with MFFP.

**Paper: Mercury and Condition of Arctic charr**

- Martyniuk, M.A.C., Couture, P., **Tran, L.**, Beaupre, L., Power, M., 2020. Seasonal variation of total mercury and condition indices of Arctic charr (*Salvelinus alpinus*) in Northern Quebec, Canada. Science of the Total Environment 738, 139450.

**Paper: Trace metal Concentration in Arctic charr**

- Martyniuk, M.A.C., Couture, P., **Tran, L.**, Beaupre, L., Urien, N., Power, M., 2020. A seasonal comparison of trace metal concentrations in the tissues of Arctic charr (*Salvelinus alpinus*) in Northern Quebec, Canada. Ecotoxicology 29, 1327-1346.

**Wildlife Biology**

**Project: Walrus Monitoring – Impact of Climate Change on Population & Habitat**

- Creation of a monitoring program to study the impact of climate change on the walrus population of Nunavik.
- First step of the project will be to use Inuit Knowledge. Elders and hunters from six communities Nunavik will be interviewed.
- Sea-ice cover will be studied using satellite imagery, drone flights and telemetry.
- The prevalence of Trichinella will be studied to get a picture of the health of the walrus population and to try to understand why some walruses are more infected in some communities than in others.
- Local hunters will be involved in the manipulation of the animals.
- A funding proposal was submitted to the INRP in December 2020; approval pending.

**Project: Beaver Habitat Expansion**

- Preliminary preparations and development of 2021 project in collaboration with Cartographic Services (DEWR) and R-NUK.

**Project: Caribou Traditional Knowledge**

- Preliminary preparations and development of 2021 project in collaboration with DEWR.

**Project: Biodiversity Monitoring (plants, insects, animals, etc.)**

- Preparation and development of 2021 project in collaboration with MFFP & MDDELCC.
- Future installation of monitoring equipment in collaboration with MFFP and Uumajuit Wardens.

**Project: River and Lake Monitoring**

- Installation of monitoring equipment in collaboration with Uumajuit Wardens.

**Project: Isuarsivik Revegetation**

- Preliminary preparations and development of 2021 project in collaboration with Isuarsivik.

**Program: Beaver Monitoring Study**

- Beaver skull collection in collaboration with McGill and RNUK.

**Program: Beluga Sampling**

- 68 sampling kits received in 2020, of those 41 were caught in 2019.
- 2020 beluga samples received (27 Total):
  - Kuujjuaq: 1 kit
  - Tasiujaq: 3 kits
  - Quaqaq: 18 kits
  - Kuujjuaraapik: 5 kits
- Equipment purchase and staff training for development of DNA Lab.

**Program: Climate Change Project Coordination at the Nunavik Research Centre**

- Preliminary preparations and development of 2021 program in collaboration with DEWR.

**Paper: Woodland Salamander Population**

- Mazerolle, Marc J.; **Lapointe St-Pierre, Mathilde**; Imbeau, Louis; Joannis, Gilles, 2021. Woodland salamander population structure and body condition under irregular shelterwood systems. Canadian Journal of Forest Research. In print.

**Wildlife Health**

**Project: Wildlife Health Monitoring and Knowledge Sharing**

- Meeting with LNUK members and Uumajuit Wardens from each community to discuss the symptoms of diseases they have noticed in wildlife.
- The goal of this is to pinpoint emergent or unknown diseases in wildlife in Nunavik using Traditional Knowledge of sick animals.
- Promotion of the Wildlife Sampling Kit program within the framework of this project is also planned.

- \$15 000 was secured for this project from the Community-Based Climate Monitoring program.

**Project: Seal Health Monitoring Study (Part of the Natsiq Project)**

- The Natsiq project was built to monitor the status of Ringed seals.
- The NRC was asked to check for pathogens and contaminants in Ringed seals.
- A protocol to check for Trichinella, Toxoplasma and other relevant pathogens will be developed.
- \$100 000 was secured for this project in order to purchase molecular analysis equipment (Polymerase Chain Reaction - PCR), have workshops with hunters and elders, and to attend training for the new equipment.
- General health of seals is also being monitored.

**Project: Charr Parasite Monitoring**

- Anisakis prevalence will be monitored through community sampling by the Uumajuit Wardens.
- 3 samples were sent by Uumajuit Wardens in the last year.
- 20 samples were also collected during a study on the Koroc River.

**Project: Arbovirus in Mosquitos**

- Catch mosquitos, count them, prepare them and send them to Université de Montréal for Arbovirus detection.

**Project: Seroprevalence of Wildlife Disease in a Sentinel Species - Dogs**

- This project is in the planning and development phase; eventually, blood samples will be taken from dogs (sentinel species) to test for diseases that can be transmitted to wildlife.

**Project: Creation of a Wildlife Health Telemonitoring System**

- This project is being done in collaboration with Université de Montréal (co-direction of a MSc. student).
- Discussion with stakeholders about the development of an ideal wildlife monitoring system.
- The goal is to have a systemic way of reporting diseased animals, as well as populational and health problems.

**Program: Walrus Trichinella Analysis**

- 40 walrus tongues received in 2020; all tested negative for trichinella parasite (meat safe to consume raw).
- We also received 4 pieces of walrus meat instead of tongues; no results could be drawn.
  - Kangiqsualujjuaq: 3 tongues
  - Tasiujaq: 3 tongues
  - Quaataq: 7 tongues
  - Kangiqsujuaq: 6 tongues
  - Salluit: 7 tongues
  - Ivujivik: 2 tongues + 4 meat samples
  - Inukjuak: 12 tongues

**Program: Wildlife Sampling Kits**

- Kits are provided to hunter in each community through the Hunter Support Office. Hunters and community members can send wildlife samples to the NRC if they find something unusual.



- These kits are analyzed at the NRC and sometimes samples are sent to Université de Montréal for further analysis.
- From February 2020 to February 2021, 6 samples were sent to the NRC.

**Program: Training of Uumajuit Wardens in Disease Sampling**

- The goal of this project is to increase the involvement of community members in wildlife monitoring.
- The Uumajuit Wardens are trained to adequately choose the type of samples to take from an animal as well as to take slides and blood samples from a carcass.

**Program: Monitoring of Rabies in Dogs and Foxes**

- Preparation of the heads of suspected rabid animals to send to the Canadian Food Inspection Agency (CFIA).
- White fox carcass processed on March 31, 2021.

**Program: Bivalve Disease Monitoring Program (mussels, clams, etc.)**

- Program development in collaboration with Health Canada and University of Saskatchewan.

**Public Health Service: COVID-19 in Wildlife**

- Written report for the Nunavik Regional Board of Health and Social Services (NRBHSS) on the risk of COVID-19 in wildlife.

**Paper: Children and Dogs in an Inuit Village - At-Risk Interactions**

- **Gouin, GG.**, Aenishaenslin, C., Simon, A., Lévesque, F. and Ravel, A. Description and Determinants of At-Risk Interactions for Human Health Between Children and Dogs in an Inuit Village. Accepted for publication, Anthrozoös.

**Presentation: Ringed Seal Monitoring**

- **Gouin, GG.**, Jean-Gagnon, F., Murray, C., Irniq, M., Basterfield, M. What's new: Natsiq - Ringed seal monitoring program in Nunavik, ArcticNet 2020.

**Magazine Article: Caribou Parasite**

- An article in Taqralik Magazine is currently being written about a parasite in caribou that has never been identified in the species before (*Sarcocystis rangiferi*).

**Training**

**Aquaculture Diseases**

- 1 staff member trained

**Carpentry**

- 1 staff member trained in carpentry skills applicable to field work

**Wilderness Advanced First Aid**

- 3 staff members trained

#### **Trichinella Analysis**

- For Trichinella detection in walrus meat, as well as seal meat in future
- 3 previously trained staff members did their proficiency testing
- 2 new staff members are completing their training
- 2 other staff members will do their training in the spring

#### **Polymerase Chain Reaction (PCR)**

- 1 staff member trained on newly purchased equipment for the Pathology Lab
- In collaboration with Health Canada and University of Saskatchewan

#### **Knowledge Sharing & Advancement of Research**

##### **Boards**

- Nunavik Marine Region Impact Review Board (NMRIRB)

##### **Committees**

- Centre d'études Nordiques (CEN) Scientific Orientation Committee
- INQ First People's Committee
- Kuujuaq Veterinary Project (KVP) Steering Committee
- MiraNor Advisory Committee (INRS)
- Nunavik Nutrition and Health Committee
- Nunavik Regional Research Authority (NRRRA) Steering Committee
- Nunavik Reopening (during COVID-19) Subcommittee on Food Security
- Qanuilirpitaa – Data Management Committee
- TUKISIK OHMI-Nunavik Steering Committee
- Vegetation (Evolution of Productivity in the North) Steering Committee

##### **Working Groups**

- Aquaculture Working Group
- Aquatic Wildlife Working Group (Lake trout Management Plan)
- Caribou Ungava Working Group
- Kuujuaq Beaver Working Group
- Nunavik Climate Change & Adaptation Strategy – Harvest Working Group
- Nunavik Climate Change & Adaptation Strategy – Health Safety Working Group
- HFTCC Fish Regulations
- Pink Salmon Working Group

##### **Networks & Research Chairs**

- Canadian Network of Northern Research Operators (CNNRO)
- Food & Environmental Parasitology Network (FEPN)
- MinEral Network – Mining Encounters with Aboriginal Peoples
- One Health Network
- Qimuksik Network – Dogs in Inuit Nunangat
- Research Chair: Traditional Food Security (McGill)

- Research Chair: Littoral (U. Laval)
- Research Chair: Wildlife Diseases (One Health)
- Sentinel North: BRiGHT (Contaminants in Arctic Waters/Food)
- Sentinel North: Climate & Built Environment
- Sentinel North: Monitoring Country Food Quality
- TerreNet – Mining Closure & Restoration Network

### **Conferences, Workshops & Significant Meetings Attended**

- Arctic Change (Dec 2020)
- Canadian Conference for Fisheries Research (Feb 2021)
- Nunavik Nutrition & Health Committee (NNHC) (Fall 2020, Winter 2021)
- Qanuilirpitaa? Data Management Committee (Fall 2020, Winter 2021)
- RNUK AGM (Feb 2021)

### **Scientific Journal Articles, Book Chapters & Reports**

- NRC staff authored 2 scientific journal articles in 2021.
- NRC staff were co-authors of 8 scientific journal articles in 2020-2021.
- NRC staff were expert peer reviewers for 3 scientific journal articles in 2020.
- NRC staff authored 1 book chapter in 2020.

### **Scientific Posters & Presentations**

- NRC staff were co-authors of 6 scientific posters in 2020.
- NRC staff were invited speakers at 4 scientific events in 2020-2021.
- NRC staff did a presentation at 1 scientific event in 2020.
- NRC staff presented at 2 community/regional events in 2021.

### **Outreach**

- Collaboration with Jaanimmarik High School students – Science Project on Water Analysis, Seal Diet and Otolith Reading.
- Supervision of U. Montreal MSc student.
- Radio & Print Media:
  - Inuit Magazine
  - Taqralik Magazine
  - Atlantic salmon Journal