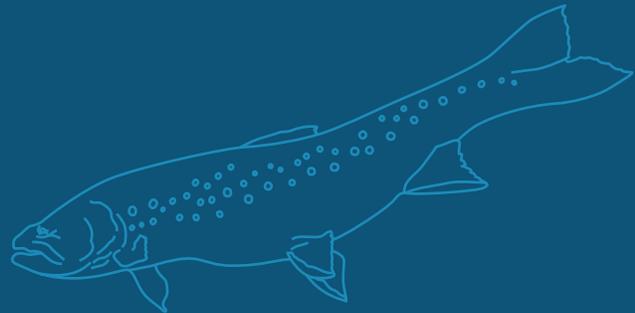
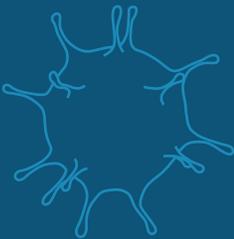




# Compendium of Indigenous Socio-economic Best Practises in Fisheries and Oceans Sectors

March 2021



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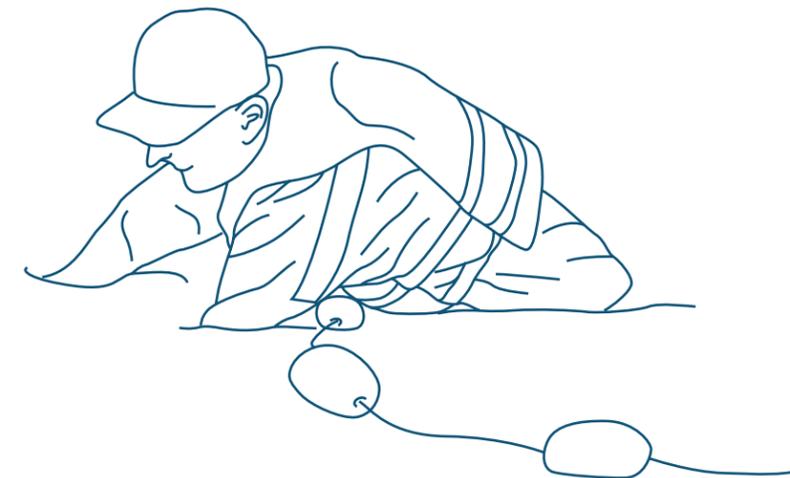


Indigenous peoples are active participants in Canada's fisheries and oceans sectors. Often, this participation involves having partners: joint ventures between communities or with industry, scientific collaborations among technical groups or with academia, and government-to-government arrangements. Some partnerships are linked to the commercial and community-based fisheries programs administered by Fisheries and Oceans Canada. Others are leveraging own source revenues, Indigenous benefit agreements or other federal, provincial or territorial programs.

Indigenous partnerships in fisheries and oceans sectors are advancing reconciliation, generating employment, contributing to stronger socio-economic outcomes for Indigenous peoples, and benefitting the Canadian economy as a whole. At the same time, these partnerships are ensuring sustainable resource use that is based on Indigenous knowledge and science—and the protection of fish stocks, habitat and oceans for the benefit of future generations.

The *Compendium of Indigenous Socio-economic Best Practises in Fisheries and Oceans Sectors* takes an in-depth look at some of these partnerships: identifying the circumstances or events which led to their creation, the steps taken by each partner to work together, and the benefits realized as a result. The features are organized into fisheries, aquaculture, processing, oceans, habitat, science, and administrative themes. They are also representative of Indigenous communities from across Canada.

*Socio-economic best practises achieve social and economic goals using unique methods that can be maintained.*



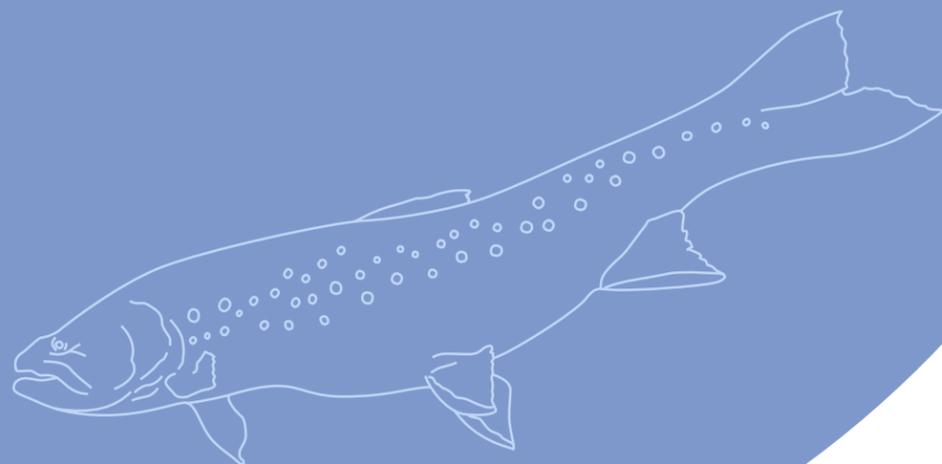
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## 7 Fisheries



Canada's fisheries sector is an important contributor to the national gross domestic product. In 2018, the landed value of commercial sea and freshwater fisheries landings was \$3.74 billion and the industry supported almost 46 thousand jobs.<sup>1</sup>

For Indigenous peoples, the value of fish is immeasurable. With traditional territories along the coastlines of the west, north and east of Canada, as well as inland along freshwater lakes, rivers, streams and creeks, Indigenous peoples have been fishing for millennia. The rights of Indigenous people to fish for food, social and ceremonial purposes after conservation are thus protected in the Constitution.

The history of Indigenous involvement in commercial fisheries since colonial times has not always been positive. First Nations in British Columbia, around Great Slave Lake, across Atlantic Canada, and elsewhere have had to fight to regain their rights to participate in marine and freshwater fisheries. Inuit and Métis populations have also had to work hard to regain their rightful place in the fisheries sector and to access licences and quota in the waters adjacent to their settlement areas and traditional territories.

Some Fisheries and Oceans Canada programs have played a key role in helping Indigenous populations re-enter commercial fisheries. These include the Atlantic, Pacific and Northern integrated commercial fisheries initiatives. There have also been federal

partnership programs to help Indigenous communal-commercial fishing enterprises diversify their businesses and expand the socio-economic benefits for their communities.

As a result of these programs, Indigenous commercial fishing enterprises today generate almost \$160 million in annual gross revenues and support 2,814 local jobs.<sup>2</sup> In Atlantic Canada, this is particularly significant, as the Mi'kmaq and Maliseet went from having a small and marginal role in the fishing industry to being key players in the 20 years following the Marshall Decision.<sup>3</sup>

Partnerships between Indigenous fishing enterprises and non-Indigenous businesses and industry are another avenue to commercial success. But how do they get started? The following stories showcase how the best practises of shared values and commitment to sustainable resource use have led to positive and sustainable partnerships and strong economic outcomes.

## Guilt-Free Seafood Powered by Shared Values

Vancouver's Organic Ocean is the world's first seafood supplier to provide DNA verification of the species it sells and identification of the river of origin for salmon harvested by First Nations. This is part of the customer assurance program that they, and their seafood producer-partners, share along with values of environmentally and socially responsible harvesting while working to protect the ocean's productive capacity.

Launched by independent West Coast fish harvesters, Organic Ocean has partnered with First Nations partners Harrison Salmon Producers and the Upper Fraser Indigenous Sustainable Harvesters Association (UFISH) since 2014.

*"When it comes to commercial fishermen and Indigenous fisheries, there is a long history," acknowledges Dane Chauvel, Organic Ocean's Founder.*

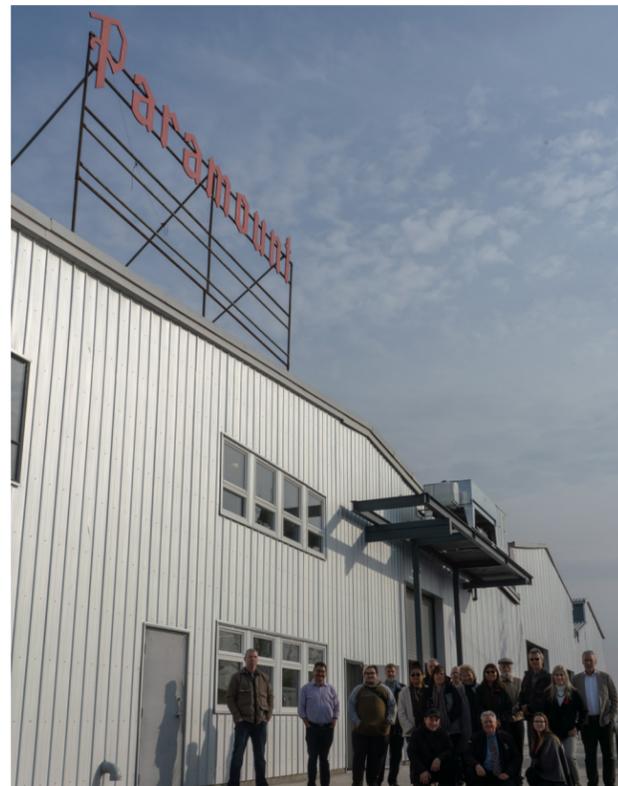
For nearly 100 years, First Nations were largely banned from commercial fishing in the Fraser and other major BC rivers. A great deal has changed since, mainly in the last decade, but culminating in the historic 2019 Fraser Salmon Collaborative Management Agreement. Under this agreement Fisheries and Oceans Canada will co-manage Fraser River salmon with the Fraser Salmon Management Council involving 76 First Nations.

Indigenous and independent commercial fish harvesters also shared a common problem with their catches and the care they took in handling them being underappreciated and undervalued by the existing seafood supply chain. Organic Ocean took a new approach and developed a channel to market that centered on supplying premium-branded seafood to chefs in the high-end restaurants and hotels. The business subsequently evolved to include the direct-to-consumer market through online ecommerce sales.

"We were looking for an opportunity to create our own logistical solutions in relation to storage, packaging and value adding," says Gordon Sterritt

of UFISH. Organic Ocean wanted to work with First Nations commercial fish harvesters who are involved in Fisheries and Oceans Canada's Pacific Integrated Commercial Fisheries Initiative to support environmentally sustainable and commercially viable fisheries for First Nations communities.

With funding from that initiative, Organic Ocean, Harrison Salmon Producers and UFISH partnered to re-open the historic Paramount cannery as part of a \$14 million rehabilitation of the commercial fishing waterfront at Steveston Harbour in Richmond, BC. The 80-year-old heritage cannery building was converted into a modern fish processing, cold storage and handling facility that will soon be federally registered. This will enable Organic Ocean to do end-to-end processing and vastly extend its export capability.



Paramount historic cannery reopening. Photo Credit: Harrison Salmon Producers



Photo Credit: River Select Fisheries Cooperative

Sterritt says catches that were once devalued by big seafood buyers are now in demand around the world.

To get to this point, First Nations commercial fish harvesters formed the River Select Fisheries Co-op to work together and build on a common approach. "When we went out looking for a commercial partnership, we found a partner that shared our values," he says.

Organic Ocean's collaboration with Harrison and UFISH has been "a happy partnership providing benefits to all parties," says Chauvel. He attributes this success to their commitment to improving the economic well-being of the fish harvesters and their communities while ensuring the long-term stability of the ecosystem which supports those fisheries.

Dave Moore, General Manager of Harrison Salmon Producers agrees: "The strength of our relationship is built upon common values. Organic Ocean acts as a mentor in market development: when to push a product or slow down and build markets. We lean on their corporate capacity in finance and administration."

In return Harrison and UFISH, and all the other First Nation commercial fishing enterprises involved in the River Select Fisheries Co-op, provide Organic Ocean

with a unique story to tell about their wild-caught product that supports Indigenous communities. "Our relationship closes the chain," concludes Moore.

Moore also believes the Pacific Integrated Commercial Fisheries Initiative has done a world of good for First Nations fish harvesters. The program has not only provided vital funding but been supportive in enabling them to diversify into other businesses such as eco-tourism.

*"As we struggle through a changing fishery, we would not have survived without this initiative," says Moore.*

Indigenous fisheries play an important role in many communities in Canada. They also serve as a main contributor of own source revenues and job creation.

**Best Practise:**  
Shared Values

## Helping Inuit Harvesters Build Sustainable Commercial Fisheries

Nutritious Arctic char is freely available to pregnant women and nursing mothers in some Nunavut communities as part of the Nunavut government's Country Food Distribution Program to replace processed food with country food. Abel Tavalok who operates a small commercial fishery in Uqsuqtuuq on Qikiqtaq in the high Arctic is more than happy that the program is one of his customers.

*"We have the best eating char in our region," says Tavalok. "Studies show it's very good for pregnant ladies and their children."*

Nunavut Inuit households are eight times more likely to face moderate to severe food insecurity than in the rest of Canada. Food costs are considerably higher than down south as are rates of diabetes and childhood rickets.

For the past five years, Abel Tavalok, James Qitsualik and other local fish harvesters have been collecting samples of iqaluk (Arctic char) from traditional fishing sites around Uqsuqtuuq (also known as Gjoa Haven) to assess the abundance and health of the resource. The harvesters were trained and paid to collect these samples as part of the Government of Nunavut's Community Aquatic Monitoring Program, better known as N-CAMP. This program has since been followed by the launch of the Northern Integrated Commercial Fisheries Initiative; a Fisheries and Oceans Canada (DFO) program designed to help Indigenous fish harvesters like Tavalok develop commercial businesses.

"I started my business three years ago, and so far, I have had eight guys work for me," he said. It was difficult to get started as there was a lot to learn but Tavalok says training and support from the DFO program has been "very helpful."



Photo: Underwater image of Arctic char.

The goal of providing 200 char a year for study and analysis is to determine the feasibility of a larger scale, sustainable commercial fishery in Uqsuqtuuq. "I'm finding more people interested in getting our char," says Tavalok.

And there's good reason for this interest. A comprehensive scientific assessment of the nutritional and pollutant levels in those samples found that they are low in contaminants like mercury and high in nutrients. They're also an excellent source of vitamin D that is crucially important for strong bones in young children and at levels sufficient to prevent rickets, which is a health problem in the region, the assessment concluded.

This analysis was part of \$5.6 million Genome Canada-supported project, "Towards a Sustainable Fishery for Nunavummiut"—a partnership between communities and university researchers—to foster economic development and improve food security in western Nunavut. The federally supported Genome Canada has a focus on deciphering genetic information, or DNA, to increase the understanding of different species and to use this information for the economic and social benefit of communities. The project was also a collaborator in the N-CAMP char sample collection activities.

The next step towards a viable commercial fishery is learning how to handle the fish to meet food safety requirements and how to market them says Stephan Schott, an economist from Carleton University who is collaborating with three biologists from Queen's University on the Genome Canada project.

The City of Yellowknife could be a good market for frozen or perhaps traditionally dried char says Schott. With a sustainable supply of fish and other communities near Uqsuqtuuq getting on board, a fish processing plant could also be a possibility, and certainly some kind of cold storage facility, he said.

*"The community is happy to see this get started," says Schott who has worked in the Arctic since 2006. It's taken him time to develop relationships with people in the community and to work with them as partners. "But in the end, it will be up to them to be the business owners and managers."*

The Northern Integrated Commercial Fisheries Initiative will continue to support training and other services on how to start and run this kind of business and other enterprises says Schott.

James Qitsualik, Vice-Chair of the Gjoa Haven Hunters and Trappers Association, is eager for this to go forward. Qitsualik has been dreaming about a commercial fishery with a processing plant for 10 years. "We have a ton of fish here. Gjoa Haven could be the fish capital of Nunavut," he says.

The sampling program has proven there are plenty of very healthy fish and added to our traditional knowledge says Qitsualik. "We're starting to see some results ... and once it gets going our people will have access to more fish and more employment."

In addition to Uqsuqtuuq, DFO has also issued exploratory licences to help determine the feasibility of commercial fisheries in Iqaluit, Taloyoak, Kinngait and Qikiqtarjuaq over the past two years.

**Best Practise:**  
*Commitment to Sustainable Use of Resources*

## How Mi'kmaq Became 50 Per Cent Owners of a Global Seafood Corporation

It was a billion-dollar deal that launched a tsunami of international media coverage: A coalition of Mi'kmaq First Nation communities are now 50% owners of Halifax-based Clearwater Seafoods. Clearwater booked over \$600 million in sales in 2019.

*"We want our communities to be self-sufficient," says Chief Terry Paul of the Membertou First Nation in Cape Breton, who, along with Miawpukek First Nation in Newfoundland and Labrador, led a coalition of five other Mi'kmaq First Nations. "We're in a better position when we are owners," said Paul.*

Owning 50% of a corporation of Clearwater's size required finding \$250 million to buy the shares. The coalition presented a strong business case to the First Nations Finance Authority and obtained a 30-year loan. That case was built through months of hard work and countless Zoom meetings with lawyers, accountants and consultants says Paul. "There was something like 35 people on one of those zoom meetings."

It all started more than 25 years ago with a personal relationship between Paul and Clearwater's founders. "They liked how I thought. I liked how they did things — very professional and using the best science," he says.

Membertou harvesters have long been selling lobsters and snow crab to Clearwater. Paul, on behalf of Mi'kmaq communities, had also long been after the company to sell one or more of their deep-water, offshore fishing licences. Early in 2020 Clearwater agreed to sell two offshore lobsters licences to Membertou.

The coalition of Mi'kmaq communities to purchase the Clearwater shares was another pivotal step forward.

"It wasn't easy" getting the 13 Mi'kmaq communities in Nova Scotia and Miawpukek in Newfoundland to agree on everything, including how to share the proceeds he says. It took a number of "really good, thorough discussions about our plans" before everyone was on board. One key was to make sure all communities benefitted no matter their size or involvement. "We all want to make progress together," he says.

A few months later there were even more discussions, this time about an ambitious plan to buy Clearwater. The company owns 21 vessels, has six processing facilities in Atlantic Canada and owns many fishing licences in Canada, Argentina and the United Kingdom.

After a number of information sessions and meetings with all 14 Mi'kmaq communities, seven agreed to join the coalition to make the Clearwater purchase. Some



Membertou fishing vessel. Photo Credit: Membertou Corporate

of the others were understandably concerned about the \$250-million long-term debt says Paul. "There's always risk but this is a very well-calculated one."

In the end having a good vision of what ownership could mean for the Mi'kmaq was key to getting the seven communities on board said Paul. "For the Mi'kmaq to continue to benefit from and share in these kinds of economic opportunities."

Finding a corporate partner for the other half of Clearwater's shares was a challenge. One major reason was the Mi'kmaq coalition's insistence that they eventually wanted 100% ownership. "Everyone walked away when they heard that," said Paul. This wasn't just a business deal for the Mi'kmaq, it was to be their future for the long term. "We're in here for the rest of time," he says.

A major Canadian food specialty and distribution company, Premium Brands of British Columbia, ended up agreeing to be their partner and offer the Mi'kmaq first right of refusal should Premium Brands wish to sell its shares.

Premium Brands President and CEO, George Paleologou, said the company was "... very pleased to be playing a role in this historic opportunity to significantly enhance First Nations' participation in Canada's east coast commercial fisheries," in a press release.

*Clearwater Seafood CEO Ian Smith told CBC News that the purchase will "...create greater opportunity and greater prosperity for Indigenous and non-Indigenous communities here at home, right here in Atlantic Canada."*

The deal also means the Mi'kmaq will have full ownership of Clearwater's offshore fishing licences, which allow the harvest of lobster, scallop, crab and clams in a massive tract of ocean offshore of Nova Scotia known as LFA 41. While the current Clearwater management and staff remain in place, the coalition plans to integrate more community members into the company's ranks.

Paul's advice to other First Nation communities is to look for opportunities to get into the world of private business. And, to have the ambition and attitude to become independent. Membertou has its own corporate division and is the very first Indigenous

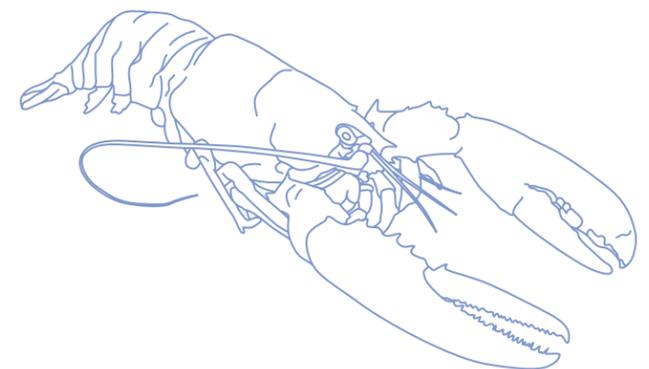
government in Canada and in the world to be receive an International Organization of Standards (ISO) 9001 certification. That, and being ranked as one of Canada's best managed companies, has given them credibility in the business world he says.

"Get into the private world," Paul advises. "Get your funding there. That's where all the money is."

**Best Practise:**  
*First Nation-to-First Nation Partnerships and Shared Priorities*



Chief Terry Paul (2020). Photo Credit: Membertou Corporate





## Aquaculture

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Aquaculture is the harvesting of fish, shellfish and plants in marine and freshwater areas. The industry includes growing and rearing fish and shellfish in hatchery facilities and the symbiotic growing of aquatic animals and plants using aquaponics.

Aquaculture is an important food production activity for Canada's domestic and international markets. In 2015, the industry generated over \$1 billion in gross domestic product and close to \$3 billion in total economic activity.<sup>4</sup> While most of Canada's aquaculture operations are located in provinces on the east and west coasts, freshwater trout operations are found in almost every province, and aquaculture also occurs in Yukon Territory.<sup>5</sup> The industry provides an estimated 14,000 full-time-equivalent jobs.

Indigenous peoples have made changes to their waterways to increase food productivity and ensure a stable harvest for their communities for thousands of years.<sup>6</sup> Indigenous approaches and support for aquaculture today may differ according to the type of activity being undertaken, the species, and the area of operation. For example, the growing of shellfish typically has more support than open-pen marine finfish aquaculture. Hatchery production of culturally important fish stocks for food security and species sustainability may also be more of interest to communities.

Fisheries and Oceans Canada (DFO) and other federal, provincial, and territorial programs have helped Indigenous communities participate in the

commercial aquaculture sector. These include the Atlantic, Pacific and Northern integrated commercial fisheries initiatives, the Salmon Enhancement Program, and the former Aboriginal Aquaculture in Canada Initiative. Some aquaculture companies have also partnered with Indigenous communities to create jobs in remote areas, while communities themselves have used aquaculture opportunities to develop new businesses, employment and wealth.

Overall, today's aquaculture industry is an important employer and economic driver for Indigenous communities across Canada. Aquaculture operations participating in the Atlantic and Pacific integrated commercial fisheries initiatives, for example, support more than 130 jobs and generate about \$14.5 million in gross annual revenues.<sup>7</sup> Thirteen First Nations in British Columbia are also under contract with DFO to operate hatchery facilities in the province while seven First Nations operate hatchery facilities in Atlantic Canada.

Indigenous communities and businesses are also looking at the aquaculture industry to create new employment opportunities, such as monitoring of aquaculture facilities, net cleaning, and aquaponics operations. The following stories feature a number of innovative ways that these communities are achieving success.

## Kelp Farmers of the Gaspé Launch Successful Business

“Will people even eat kelp?” wondered members of the Mi’kmaq Maliseet Aboriginal Fisheries Management Association (MMAFMA) in Quebec’s Gaspé Peninsula. The Association, an Indigenous non-profit, was looking for new ways to utilize the marine resources and create jobs in its territories back in 2012. It turns out that people love the products made with the sugar kelp farmed by the community in Chaleur Bay off the south shore of the Gaspé.

*“We’ve grown from a small test project to an incorporated company called Salaweg that farms kelp and sells kelp products,” says Catherine Lambert Koizumi, MMAFMA’s Executive Director. The member communities involved are Mi’gmaq Nations of Gespeg and Gesgapegiag and the Maliseet Viger First Nation. Salaweg means “salted” in Mi’gmaq.*

Kelp is a type of large brown seaweed that grows in cold, shallow and nutrient-rich saltwater off coasts around the world. Sugar kelp (*Saccharina latissima*) is a fast-growing kelp that contains antioxidants and a wide range of nutrients, including high levels of iodine. It is naturally abundant in the Chaleur Bay. It is also habitat for lobster and other aquatic species on which the local communities rely.

Part of MMAFMA’s mission is the conservation of the aquatic and oceanic ecosystems in its territories, so farming kelp was explored in order to avoid harvesting wild kelp and putting pressure on lobster habitat. “We weren’t doing any aquaculture so we had to learn new skills,” says Lambert Koizumi.

The community began by renting lines from mussel farms and attached kelp seedlings, with funding from Fisheries and Oceans Canada’s Aboriginal Aquatic Resource and Oceans Management Program, other federal agencies and the Province of Quebec. The seedlings are grown indoors at Fermes Marines du Québec and sown onto a string. In the fall, the string with its attached seedlings is spooled around the rented lines in Chaleur Bay. The lines run parallel to



Photo credit: Lina Condo, Ulnooweg Development Group

the surface and are submerged in winter to a depth of seven meters to avoid ice damage. When the ice melts, the lines are brought up to four metres so the kelp can benefit from a maximum amount of light to grow rapidly. Harvesting takes place in June.

The kelp is processed in the community’s lobster hut in Gesgapegiag, a collaboration that keeps production costs down. “Everyone has been enthusiastic to see this become a real business,” Lambert Koizumi said. “At the beginning even though kelp wasn’t a known product, the community was open to the idea and helped out with transport or anything else.”

The first harvests for Salaweg were not particularly successful but MMAFMA persisted and focused on developing recipes and products based on sugar kelp.

“We did a lot of marketing, working with chefs and participating in food fairs,” says Lambert Koizumi.

Following a good harvest in 2017, Salaweg launched four products: sea relish, tartar mix, fish spice, and meat spice.

Last year, Salaweg was incorporated as a for-profit enterprise and hired Frédéric Côte to bring more of a business focus. Côte says existing products will be made more commercially attractive and consistently flavourful. “We want people who have tried our products to continue to buy it,” he says.

Salaweg products also tell an important story of how the kelp is grown without chemicals in some of the purest ocean waters and harvested by First Nations. With a hoped-for harvest of six tons of kelp this year, Côte would also like to launch two new products. And with additional lines going in the water in October this year, production in 2021 should double to 12 tons. That should enable sales of some products to large supermarket chains, he said.

*“In this time of reconciliation, there has been a lot of interest in the delicious products harvested by First Nations,” says Lambert Koizumi. This can also play a role in breaking the walls between Indigenous communities and the rest of the world she added.*

Up to 10 people are now employed part time during the season with more being hired as the business expands. Lambert Koizumi attributes their success to the willingness of the communities to be proactive, persistent and open-minded.

“We’ve really moved a long way with this. I’m very proud of this project.”

**Best Practise:**  
*First Nation-to-First Nation Partnerships*



Photo Credit: Mi’gmaq and Maliseet Fisheries Management Association

## Cross-training Staff, Supportive Community and Business Resiliency Key to Award-winning Lennox Island Mi'kmaq First Nation Shellfish Hatchery

Business is booming at the Bideford Shellfish Hatchery says Mike Randall, executive director of Lennox Island Development Corporation. Launched in the spring of 2016, Bideford is the only Indigenous-owned and operated oyster seed facility in Atlantic Canada.

“There’s a huge demand for our oyster seed because of its quality and reliability,” Randall says.

He credits much of their success to a well-trained and dedicated staff, all of whom are from Lennox Island Mi'kmaq First Nation. This community of 450 members is located in Malpeque Bay off the northwest coast of Prince Edward Island.

*“We’re creating life here. Things can go south really fast and we could lose an entire spawn. That’s why everyone is cross-trained and able to do anything at the hatchery from cutting the grass to doing chemistry in the lab to scrubbing out rearing tanks.”*

“We want everyone to be ‘MacGyvers,’” he continued, referencing the hero from the TV series in the late 1980s who could create problem-solving devices out of common items.

Bideford is the home of the wild oyster industry and the world-famous Malpeque oyster, but disease has greatly reduced the wild oyster population. Oyster farming took over but there was only one Atlantic Canada source for oyster seed, which is the larval stage when an oyster bonds to shells or another hard surface.

Lennox Island First Nation saw an opportunity to develop an oyster hatchery in the Bideford River Marine Centre, a long-shuttered federal government research station which the community had previously acquired. With funding from federal and provincial governments, the building was retrofitted and refurbished.

Obtaining funding can involve a lot of hard work but it’s important for any new enterprise advises Randall. Finding funding sources requires networking and maintaining relationships while getting the funding



requires being knowledgeable, understanding money and having a solid business and design plan. “You also need a clear roadmap on how to execute your plan,” he says.

The community hired a hatchery expert to design the facility and then a well-connected shellfish aquaculture veteran to be the manager. “He trained the workers and was a great mentor,” said Randall.

Successfully growing oyster seed is an exacting business. It requires very specific water chemistry and temperature to grow the seed from spawning through its life stages to the shipment of a healthy, disease-resistant product. That’s why hiring the right kind of people is so important, says Randall. “They need to be willing to do whatever job needs doing, to be part of a team with a common purpose, and to be honest.”

*“If a mistake is made, they have to be honest so we can learn and fix it. No one is going to get in trouble for a mistake.”*

Being resilient is also crucial. When something goes wrong it’s important to “wind back the clock” to learn what happened and fix it quickly.

Randall says the people at Bideford hatchery are motivated to make it successful to both benefit the community and show the world what they can do. In 2018, Bideford won the Ulnooweg Entrepreneur Award for Aboriginal Government Enterprise of the Year.

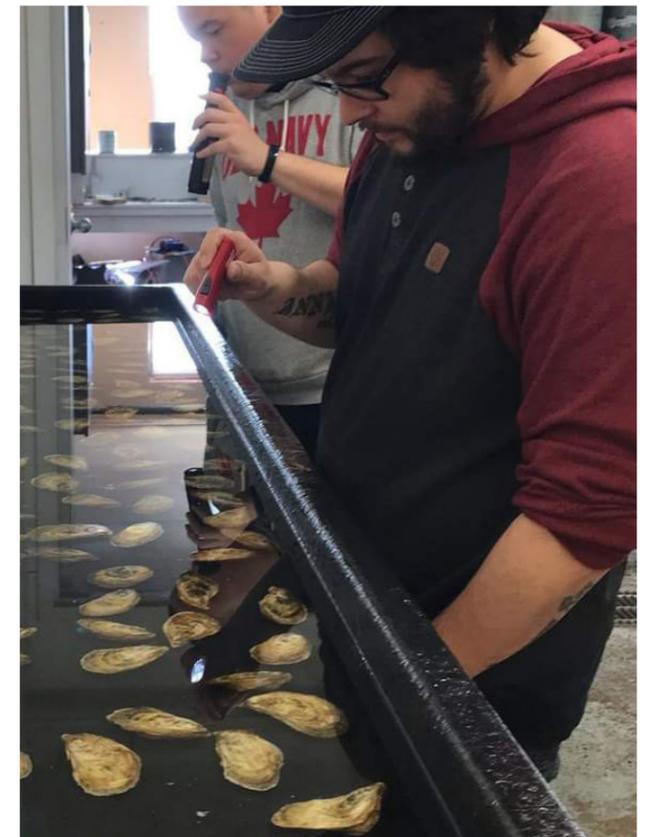
Support for the hatchery in the community has also been strong, he added. “This is a result of being upfront regarding any problems or delays.”

The success of the hatchery enabled Lennox Island to start their own oyster farm in 2019 using their own seed. “We’re learning and the oysters are growing beautifully. They are marketed as ‘Lennox Island Choice Oysters.’”

The community has a lot of capacity to expand both the farm and the hatchery, with the latter now growing quahogs.

“There are a lot of great jobs in the aquaculture industry,” says Randall. “We’re re-creating our old ways using modern technology.”

**Best Practise:**  
*Capacity Building through Training and Mentorships*



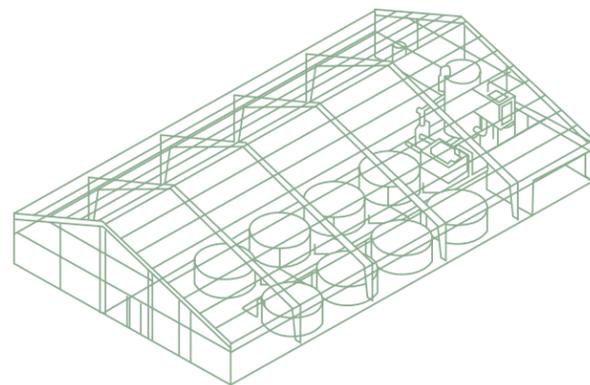
## Aquaponics Project Delivers Fresh, Locally Grown Vegetables and Fish Year Round

Imagine being able to eat locally grown fresh Rainbow trout and leafy-green vegetables all year round. That may soon be possible for the Moose Cree First Nation living in Moose Factory on James Bay thanks to their proposed aquaponics project.

*“Food sovereignty and food security is of great importance to our community,” explains Stan Kapashesit, the Moose Cree First Nation aquaponics project manager. “We’re on an island and our food also has to be shipped a long way.”*

Aquaponics combines raising fish in tanks (recirculating aquaculture) with growing plants in a soil-free environment (hydroponics). The nutrient-rich water from raising fish provides a natural fertilizer for the plants while the plants help to purify the water for the fish. It’s a system that mimics a natural ecosystem.

The Moose Cree plan is to build a 6,000 square foot steel-frame building to house the tanks pumps, aerators and other aquaponics equipment. It is designed to grow 80,000 heads of lettuce and kale, along with cucumbers and tomatoes, and around



2,000 kilograms of rainbow trout every six months. It won’t use a great deal of electrical energy or heat to run and there are plans to incorporate solar panels later on Kapashesit says.

Besides being an economic driver for the community, the facility will be integrated into the local schools so children will have learning opportunities in sciences and life skills including biology, agriculture, aquaculture and nutrition. The facility will also be used to raise sturgeon fingerlings to help re-stock the Moose River.

The detailed design stage of the project has been completed and is now nearly shovel ready. Aquaponics is a relatively unknown technology, so getting the \$1.8 million in funding for the project has been a challenge. “We’re hoping to hear some good news on this soon.”

An important first step in getting the project started was educating the community about aquaponics and its potential to provide lower-cost food, as well as improved variety and quality. Along with information sessions, members of the economic development committee toured aquaponic facilities down south.

A small demonstration facility located in the Cree Cultural Interpretive Centre will first be operational so everyone will see first-hand how aquaponics works.

“We hope to be sharing some of our home-grown lettuce by early spring,” says Kapashesit.

Members of the community were also surveyed to find out what kind and how much fresh leafy vegetables and fish they would be likely purchase if it were available. The facility was then specifically scaled to meet the needs of the 2,500-member community.

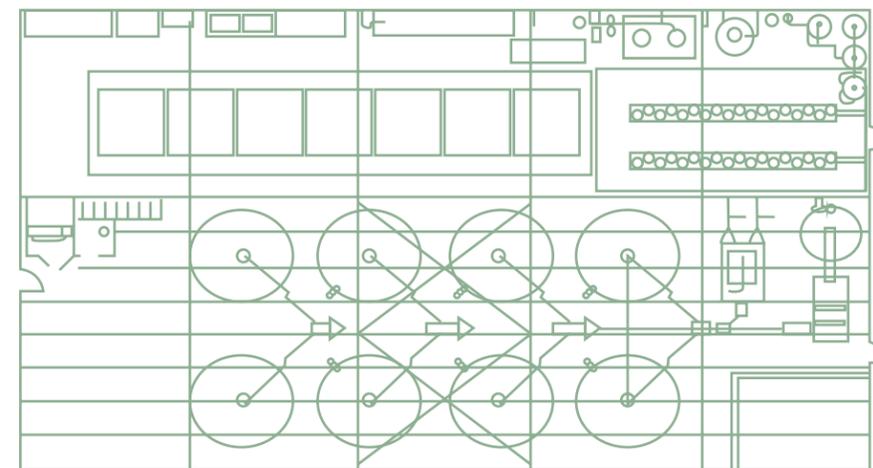
The scalability and flexibility of aquaponics and aquaculture are an ideal fit for many Indigenous communities says Nick Huber, the aquaculture specialist at Waubetek Business Development Corporation. Waubetek is an Indigenous-owned financing institution with the mission of improving the sustainability of First Nations through business

development. Waubetek is assisting communities with aquaculture projects in Ontario, including Moose Cree, as well as in Manitoba, Saskatchewan and Alberta, as part of the Business Development Team for the Northern Integrated Commercial Fisheries Initiative.

The costs of growing food from aquaponics can be higher compared to traditional farming, but less than what remote northern communities pay for food due to shipping costs and other factors. Locally grown food is also fresher and more nutritious. And it also keeps money in the local community, Huber says.

“With growing awareness, many communities have been looking into aquaponics and aquaculture to become more self-sufficient in food production and the economic opportunities,” he says. These facilities can have a big impact on communities by addressing food security concerns and providing economic opportunities from raising fry or fingerlings to restock a local river or lake for commercial production. And, communities don’t need to be on the ocean or a lake to do this as nearly any source of water will do.

*“I’m happy to talk to anyone about the potential of aquaculture,” says Huber. For example, Huber and the Waubetek team have been assisting Moose Cree First Nation through the development of their commercial operation and demonstration facility by providing technical advice and financial support through the program.*



“It helps to have someone champion the project in the community,” he says.

That champion needs patience and persistence. It’s taken five years to get to the point where the Moose Cree aquaponics project is awaiting final decision on funding. Kapashesit says Waubetek has been very helpful and that he has learned an enormous amount about aquaponics. Good partners and solid understanding of the entire project have been crucial.

It was also important to train the local people who will operate the facility so they will also be able to repair it. “We’ll have up to six people working when it gets going.”

When asked what advice he’d like to pass on, Kapashesit said: It’s prudent for communities to know where their food comes from and to explore alternatives. “I’m happy to talk to anyone about our experience.

**Best Practise:**  
*Community Values and Adaptability Drive Economic Development*

## Agreement to Shut Down Some Salmon Aquaculture Operations in BC: First Nations to Monitor Remaining to Protect Health of Wild Salmon

Open-net Atlantic salmon fish farms have been very controversial among First Nations in coastal British Columbia. But rather than occupying the farms, the Broughton Archipelago First Nations now visit them to monitor the health of industry's captive fish. Their aim is to ensure the protection of the wild Pacific salmon in their territory on the northeastern flank of the Queen Charlotte Strait off the coast of British Columbia.

In a remarkable development following years of protests and court hearings, Broughton Archipelago First Nations and the Province of British Columbia agreed in a landmark Letter of Understanding (LOU) to develop a consensus-based process to develop recommendations related to open-net fish farms. Consensus recommendations were developed in the fall 2018, including the decommissioning of 10 of 17 operating farms by 2022, the establishment of an independent genomic lab, and the creation of Indigenous monitoring and standards for the remaining fish farms by First Nations to determine whether the remaining tenures may be renewed to continue operations. These recommendations were also supported by the two companies operating the fish farms in the region.

*“There’s been a tremendous shift...it’s been quite an amazing journey,” says Kelly Speck of the ‘Namgis First Nation. ‘Namgis, Kwikwasut’inuxw-Haxwa’mis, and Mamalilikulla comprise the Broughton Archipelago First Nations.*

“The ‘Namgis First Nation was in the middle of planning a court case against the Department of Fisheries and Oceans in the fall of 2017 when everything changed in the relationship with the Province,” says Speck who was a First Nations representative throughout the process to reach the LOU.

Canada is the fourth largest farmed salmon producer in the world and Atlantic salmon is Canada’s largest aquaculture export. In 2017, Atlantic salmon aquaculture production was valued at one billion

dollars and British Columbia was the main producing province. However, open-net aquaculture has been the subject of a great deal of debate regarding the role of viruses, diseases and sea lice from these operations in the sharply declining wild salmon populations.

The current BC government wanted to embrace free, prior and informed consent as outlined in the UN Declaration on the Rights of Indigenous People and met with First Nations in October of 2017 to begin to talk about fish farms among other issues. They agreed to a shared decision-making process based on consensus to resolve the issue of the farms, since the tenure licences for all 17 fish farms in the Broughton region were up for renewal at the time.



LOU signing. Photo Credit: Bob Chamberlin

“We created a true government-to-government process,” says James Mack, Assistant Deputy Minister at the BC Ministry of Agriculture, Science and Policy. Being equals in the decision-making process enabled both First Nations and government to develop an understanding of each other and their different interests and priorities, and to reach consensus on the way forward Mack says.

“This is a flagship case on reconciliation goals,” he says. It provides a concrete example of how “taking a different approach in looking at First Nations governance resulted in an outcome that works for everyone.”

In the LOU, the BC government agreed that the industry required consent of the Broughton Archipelago First Nations to work in their territory after 2022.

*“It was a perfect storm of events,” says Bob Chamberlin, a former elected Chief of the Kwikwasut’inuxw-Haxwa’mis First Nation. Although Chamberlin had opposed the farms for all 14 of his years as an elected chief, immediately getting rid of the farms would have economic impacts locally and be unfair to the industry and its employees he said.*

A transition plan was hammered out through many meetings in 2018 with consensus that the farms were having an impact on the environment and wild salmon. The transition plan integrated traditional ecological knowledge on salmon migration which became the basis for decommissioning the first farms to protect migration routes says Chamberlin.

Of the 10 farms to be decommissioned, seven have already been pulled out of the water and the Indigenous Monitoring and Inspection Plan (IMIP) has begun thanks to the support of the BC Salmon Restoration and Innovation Fund. Under the IMIP, First Nations are leading the monitoring of fish health, sea lice, pathogens, disease agents and diseases before and after introduction of fish into the fish farm.

In co-operation with aquaculture companies, First Nations are also taking samples of smolts (young salmon) from industry hatcheries. These are being tested for piscine orthoreovirus (PRV) which is quite common even in healthy farmed Atlantic salmon. If PRV is detected, smolts will not be transferred into saltwater net pens. The testing is done by the



Photo Credit: Bob Chamberlin

Okanagan Nation Alliance’s (ONA) kt c̓p̓əl̓k st̓im̓ lab that supports the ONA’s hatchery in Penticton, BC.

“We’ve been testing for PRV since the fall of 2019,” says Chad Fuller, the ONA Fisheries Research and Diagnostic Biologist. Only one sample so far has been found affected by heart and skeletal muscle inflammation, the disease linked to PRV says Fuller.

The partnership between ‘Namgis First Nation and the ONA is a first step to establish an independent BC First Nations’ Genomic Lab that will offer state-of-the-science, high-throughput pathogen testing using the Fluidigm BioMark™ technology.

Infectious disease contributes to declines in wild salmon populations and is detrimental to the success of salmon enhancement activities. Sea lice are another major concern as they often infest farmed salmon and when vulnerable wild juvenile salmon passing by the net-pens on their migration they too can become infested.

“We want to do live and area-based sampling to find out how the lice might spread between farms,” says Speck of ‘Namgis First Nation. And, under the monitoring plan there will be tighter control of lice on farmed salmon in the pens. “We work with the companies but we collect and analyze the data allowing for more transparency and independence,” she says.

Previously First Nations didn’t have a relationship with the aquaculture companies. However, through the various shared decision-making processes that led to the agreement, all parties have learned from each other says Speck. “We had to accept that the companies have a business to run while they now understand they need our co-operation if they want to be in our territory.”

It has taken a lot of dialogue and learning over the past two years but the results have been “very satisfying and rewarding” said Speck. This includes rebuilding strong relationships between the three Broughton Archipelago First Nations.

“I think we also have a foundation for a new relationship between government and First Nations,” she concluded.

**Best Practise:**  
**Commitment to Reconciliation**



## Fish and Seafood Processing

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Canada's fish and seafood processing industry is a strong contributor to the national and regional economies. In 2016, fish and seafood processing provided \$4.66 billion to Canada's gross domestic product and supported 52,573 jobs.<sup>8</sup> In British Columbia, the industry contributed \$232.8 million to the province's gross domestic product and employed 2,600 people.<sup>9</sup> In Atlantic Canada, annual exports are worth \$3.9 billion and the industry employs 15,670 workers.

Indigenous peoples have been involved in fish and seafood processing for local food consumption, bait, fuel, medicines, clothing, tools and trade for thousands of years. Traditional food processing techniques included drying, smoking, and freezing in ways that varied by region or group. Some of these methods continue to be used today. Indigenous people are also involved in current processing techniques, including canning and mechanized processing plants and vessels.

More than 3,500 Indigenous people are currently involved in fish and seafood processing, and labour market studies show opportunities for employment growth. Across Canada, only 11% of the seafood processing workforce is Indigenous,<sup>10</sup> while the industry experiences acute annual labour shortages.<sup>11</sup> The industry also offers opportunities for Indigenous ownership as commercial fishing enterprise owners and aquaculture operators look for ways to diversify and vertically integrate their businesses within the fish

and seafood supply chain. This includes by getting involved in secondary and aquatic plant processing, as well as unique Indigenous branding, marketing and certification initiatives.

Investing in fish and seafood processing serves different business models and priorities of Indigenous communities. For example, some have purchased or renovated a processing plant to provide jobs to community members, while others have retained the current employment structure and used the revenues to fund other community priorities.

The employment, revenue generation, and food security benefits of fish and seafood processing are also of interest to Arctic communities across the Inuit Nunangat and other Indigenous communities in the territories and northern inland provinces. The Kitikmeot Food plant in Iqaluktuuttiaq, for example, employs six full-time permanent and 14 full-time seasonal staff and distributes its products across the region and into southern parts of Canada. While there are three other fish and seafood processing plants in the territory, Nunavut has identified a need for increased processing capacity, including in partnership with foreign investors.<sup>12</sup>

The following stories offer an in-depth look at the socio-economic successes of Indigenous communities that diversified into fish and seafood processing.

## Indigenous-owned BC Salmon Cannery Revitalizing Economies of Nuuchahnulth Communities

St. Jean's Cannery and Smokehouse in Nanaimo, BC is the largest tuna and salmon cannery in Canada. The Indigenous-owned cannery is also a gourmet food retailer that is known for many specialty products, including smoked Pacific oysters and seafood under the authentic Indigenous brand, *Gratitude Seafood*.

*"We bought St. Jean's because of its expertise and reputation," said Larry Johnson, Nuuchahnulth Seafood Limited Partnership President. "It was also a good investment because it lined up with our traditional practises and principles."*

Nuuchahnulth Seafood was formed in 2003 to help communities get more involved in shellfish aquaculture and commercial fishing and regain control of the marine resources that had sustained them for tens of thousands of years. The Nuuchahnulth principles Johnson mentioned are: Hish-uk ts'a-walk (everything is one), lisaak (a greater respect with caring) and Uu-a-thluk (to take care of using a modern approach). These principles bind the communities together as First Nations and are woven into any business model says Johnson.

Family-run for more than 50 years, St. Jean's was purchased in 2015. The sacred principles of the Nuuchahnulth Nations are one reason the previous owner Gerard St. Jean sold the cannery to Nuuchahnulth Seafood. "Corporations come and go. We're here for the long haul," said Johnson.

Funding from the federal Pacific Commercial Fisheries Diversification Initiative was "very instrumental" in the purchase said Johnson. The time-limited Strategic Partnership Initiative program was established to enhance the participation and economic benefit of Indigenous communities in commercial fisheries activities on the west coast. It also leveraged the success of Fisheries and Oceans Canada's Pacific Integrated Commercial Fisheries Initiative.

Canneries once flourished along the BC coast with as many as 80 in operation in 1918. While St. Jean's is now the last cannery in Canada, it continues to thrive under Nuuchahnulth ownership. Up to 130 workers are employed at the cannery, which produces as many as 30,000 cans a day during peak production periods. Canned products are sold under the St. Jean's and Raincoast Trading retail brands.

The new *Gratitude Seafood* brand is a specific to Nuuchahnulth Seafood LP. The company used the knowledge learned from the St. Jean's experience to develop the authentic Indigenous brand, which was launched in 2019. St. Jean's is also used as the co-packer of *Gratitude Seafood* products.

St. Jean's handles processing for a number of commercial clients, including First Nations in the interior of the Province, as well as thousands of recreational fish harvesters who want their catch custom canned or smoked.



The transition of the cannery to Nuuchahnulth Seafood was eased by Gerard St. Jean and the cannery's employees. There is mutual respect and sharing of values says Johnson. "It's been a mutually beneficial relationship that continues to this day."

*"We're a corporation with a professional board of directors who have expertise in finance, commercial fisheries, law and First Nations governance," says Jennifer Woodland the CEO of Nuuchahnulth Seafood. "Where we don't have expertise, we find partners that do and learn from them."*

Strategic planning is a key ingredient in their success she says. A five-year plan sets the future direction as a result of brainstorming for opportunities and then doing the research to determine their viability. A detailed one-year plan then lays out the tasks for the year ahead. "We take our time and stay true to our mission," says Woodland.

Taking time can mean building capacity by helping communities purchase boats, quotas and licences, and helping with business and financial planning.

The Business Development Team in the Pacific Integrated Commercial Fisheries Initiative played an important role in this work. "They've been really great to deal with," she says. "We took our time. We've been open and honest and have built a strong mutual relationship with them."

Both Woodland and Johnson say they separate business from politics.

Helping the Nuuchahnulth gain experience in processing sales and marketing through the purchase of St. Jean's fit perfectly with the overarching goal of reconnecting community members to their marine roots and revitalizing community economic opportunities through new, sustainable activities related to seafood harvesting. "It's helping to bring life back into our communities," says Johnson.

**Best Practises:**  
*Business Diversification  
and Shared Values*

## First Nation's Processing Plant a Major Regional Employer

Esgenoôpetitj First Nation owns and operates a thriving fish processing plant in the village of Bas Caraquet on the shore of Chaleur Bay in New Brunswick. Baie Chaleurs Fisheries processes around five million pounds (2.3 million kilograms) of snow crab annually and a \$4.5 million expansion is planned to update equipment, increase capacity, and add lobster processing by the fall of 2021.

Fishing is the major economic driver for Esgenoôpetitj. The First Nation took full control of the plant in 2015, which employs up to 166 people each year. Twenty-five per cent of these employees are First Nations.

*"The processing plant creates jobs and additional revenues in communities where jobs are scarce," says Clark Dedam, President and General Manager of Baie Chaleurs Fisheries. "It also provides pride in having a job."*

Esgenoôpetitj First Nation is a Mi'kmaq community of 1,929 registered band members who mostly live on Miramichi Bay. Snow crab is the biggest earner with 100 per cent of the profits going back to the community. There are three large community crab boats employing band members. A number of non-Indigenous crab boats also sell their catches to the plant.

"We used to process herring as well but the catches have gone way down," says Dedam.

Since Esgenoôpetitj is located approximately 100 kilometers south of the plant, a "bunkhouse" for 40 workers was built next to the plant in 2016. It has two floors—one for men, and one for women—and features kitchens, showers and common areas. The \$400,000 cost to build the bunkhouse was divided between three levels of government and the First Nation.

"We have 12-hour shifts, so spending three or four hours a day driving back and forth made it hard to attract workers. And it can be dangerous," said Dedam.

The bunkhouse is just for First Nations employees and helps ease the transition from their community to the plant and living in Bas Caraquet village. "They're like a family there, eating supper together and so on," he says. It has been very instrumental in the processing plant's success and has attracted quite a few younger community members who also benefit from the wisdom and advice from the bunkhouse's housekeeper and cook.

"It's a very demanding job," says Dedam, people are working up to 10 days straight. However, the season is only 8-10 weeks a year in which to make your livelihood.

Working in the plant away from the community can be a culture shock, so Dedam has found that an extended orientation is essential for new employees. "I'm very direct and say they must respect the rules and we'll give them every opportunity to succeed." That includes being more than plant workers and learning other aspects of the business from quality control to sales. "I'm happy to mentor someone to take my place one day."



Baie Chaleurs Weight Scale. Photo Credit: Baie Chaleurs

Open communication is also important in a plant with workers speaking different languages and coming from different cultures. A First Nation foreman brings any personnel issues directly to Dedam so things can be worked out quickly. It's often some kind of misunderstanding he says.

*"Hiring good people and having strong council support has been essential in building the business."*

With a major expansion underway today at Baie Chaleurs Fisheries, it's hard to imagine that the plant was on the verge of bankruptcy not long after Esgenoôpetitj First Nation took full control of the business from their previous partners. Fortunately, a Mi'kmaq finance company, Ulnooweg Development Group Inc, provided a major loan to the business.

The community was also new to fisheries and fish processing so there was a steep learning curve to take on roles like finance and sales says Dedam. A consultant was hired to help run the plant at the beginning but overall, it was a lot of trial and error, and we're still learning he says.

"I'm proud of what we've accomplished. We ship the best darn snow crab all over the world."

First Nations commercial fisheries in Atlantic Canada generate about \$110 million in gross revenue every year and employ approximately 1,675 people. This includes seafood processing workers such as those employed at Baie Chaleurs Fisheries.

**Best Practise:**  
*Business Diversification and Shared Values*



Baie Chaleurs Bunkhouse. Photo Credit: Baie Chaleursw



Bunkhouse Interior. Photo Credit: Baie Chaleurs



## How Lax Kw'alaams Turned a White Elephant into a Sustainable, Locally Owned Fishing Industry

In the fishing industry, things can change in a blink of an eye says Josh Kierce, Chief Financial Officer of the Coast Tsimshian Fish Plant, the biggest employer in Lax Kw'alaams on the northwest coast of British Columbia between the rich headwaters of the Nass and Skeena Rivers.

*“A reliably abundant fish species can deteriorate over time,” says Kierce. “You have to stay active and always look for new opportunities.”*

In 2011, Lax Kw'alaams First Nation found a new opportunity in an old, long-unprofitable seafood processing facility. The processing plant was built in Lax Kw'alaams and operated by the federal government in the 1970s to capitalize on the wealth of salmon in the area. Although a major employer, the plant was unable to turn a profit even when it moved into the hands of commercial operators.

The Nine Allied Tribes of the Coast Tsimshian comprise the Lax Kw'alaams First Nation with approximately 4,000 members. The Band Council saw the potential for the processing plant to provide long-term, sustainable jobs and economic development for the community.

However, they knew it would have to operate differently to achieve these outcomes. This meant relying less on salmon and more on groundfish to diversify the products it processed and to generate months of additional employment for seasonal plant workers.

The Lax Kw'alaams were able to secure a \$7.5 million dollar loan and made extensive renovations to the plant to update and increase its capacity. When the Coast Tsimshian Fish Plant opened in October 2012, it was the biggest and most technically advanced processing facility in the region. The plant can process an average of 400,000 pounds of fish per day, with on-site storage capacity of one million pounds. In a season, this means it can process over 42 million pounds of groundfish and 17 million pounds of salmon.

Today, the Coast Tsimshian Fish Plant is the major employer in the community, with more than 70 people working full time year-round and up to 170 workers during the peak processing season. The plant has also begun turning a profit in recent years and remains focused on benefitting the community. “The community is very supportive. When we need workers, the community always helps out,” says Kierce.



The community also helps by bringing in the bulk of the groundfish the plant processes, as Lax Kw'alaams owns and operates two large trawlers. But the challenge with a processing facility this size and in a remote location makes it difficult to source enough fish to keep the plant busy.

It's very important to build relationships with others in the fishing industry to secure additional supply says Kierce.

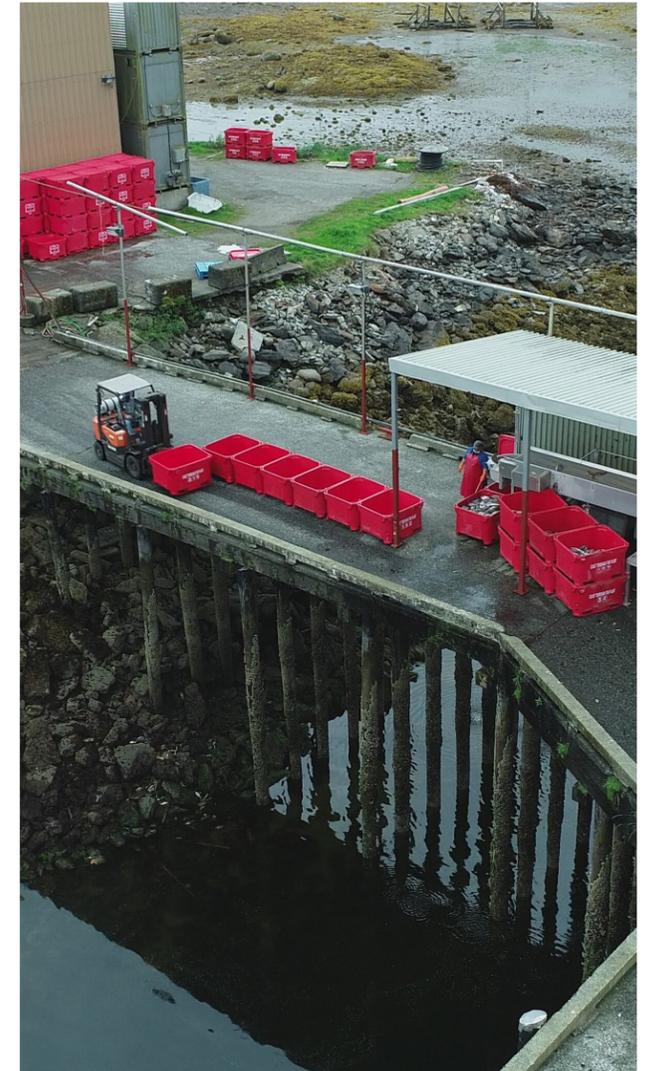
Being the only processing plant in such a remote, but rich, fishing region is both an advantage and disadvantage adds Kierce. “Being close to the fishing grounds of the North Pacific allows us to sell a high-quality product. However, there are high logistic costs to export our fish down south.”

At the very outset of the plant's renovation and launch, staff received training in a wide range of areas from first aid to forklift operation. Education and training are now being offered to develop a secondary industry around the processing plant in order to provide added value to its product by marketing it locally. Community members have even been exploring ideas such as establishing a food truck business.

The fishing industry is a challenging business says Kierce who is a chartered accountant and grew up fishing in Prince Rupert. You need knowledgeable people, industry veterans who can teach and train others, he says. “To succeed in the fish processing business, it's important to diversify your harvest and product offerings. It's also important to consider sustainable fishing practises and protecting aquatic life by eliminating ghost gear.”

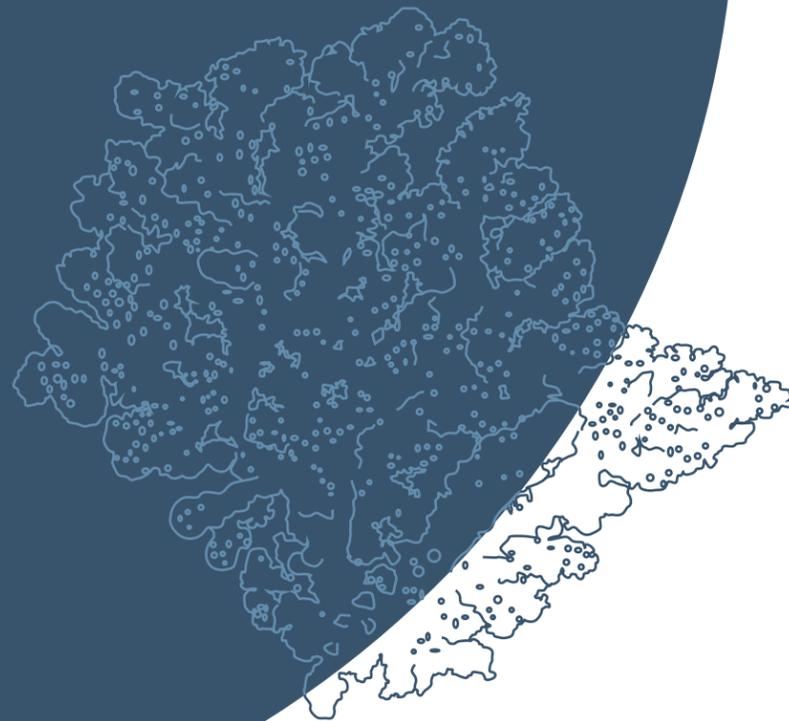
Finally, for any community looking to get into the business, Kierce advises that they build strong relationships with people in the industry to create and grow opportunities.

**Best Practise:**  
*Community Values and Adaptability  
Drive Economic Development*



## Oceans

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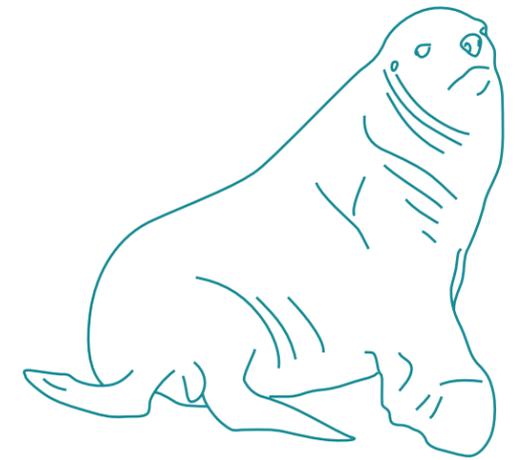


Canada has the world's longest coastline and one of the largest ocean bodies.<sup>13</sup> Approximately 70 per cent of this coastline is in the Arctic with 176,000 kilometers of coastline from Yukon to Labrador.<sup>14</sup> Combined, the ocean area in the Pacific, Arctic and Atlantic is approximately 5.7 million square kilometers.

Oceans support an abundance of ecological and biological life that has provided food and medicines to Indigenous communities for thousands of years. Historically and today, oceans serve as transportation routes for trade and social interaction—and they are part of the cultural identities of First Nations and Inuit peoples.<sup>15</sup>

Canada's oceans and ocean resources are significant contributors to the national economy employing almost 300,000 Canadians and contributing more than \$31.7 billion to the gross domestic product.<sup>16</sup> This economy involves many diverse industry sectors, including fishing and aquaculture, marine transportation, oil and gas exploration, eco-tourism and renewable energy, among others.

Canada's Ocean Supercluster has been working to grow the ocean economy, bringing industry leaders together to develop and commercialize solutions that will address shared ocean challenges.<sup>17</sup> Indigenous people and businesses are included in this initiative. The Career Pivot Program, for example, is supporting meaningful work placements for Indigenous participants who want to explore their career options in the ocean economy. Elsewhere in



Canada, Indigenous and non-Indigenous businesses are also entering into joint ventures to diversify their operations within the oceans sector.

Marine protected and conservation areas enhance biodiversity and ensure ongoing sustainable use of oceans waterways and resources. Indigenous, federal, provincial and territorial governments have been collaborating to develop marine protected and conservation areas across Canada and to meet commitments of 25% coverage by 2025 and 30% coverage by 2030. They have also been working together, and with others, to co-manage the many uses of oceans spaces through marine spatial planning.

Protecting and sustainably using marine spaces are priorities for coastal First Nations and Inuit communities across Canada. Indigenous-led marine protection has in fact been a model on which federal and provincial initiatives have been built and continue to be shaped. Modern treaties and other formal agreements may also outline how marine stewardship and use is permitted in certain oceans areas.

There are socio-economic benefits to be gained from both industrial and protection activities in Canada's three oceans. Indigenous governments, groups and businesses are at the forefront of these activities to ensure their citizens and community members benefit from the oceans today and for generations to come. A few such examples are featured in this section.

## In-Depth Community Dialogue Key to Haisla Nation's 12-Year \$500 Million Contract

Haisla First Nation and their partner Seaspan ULC have won an unprecedented \$500 million, 12-year contract to build and operate tugs to escort liquified natural gas (LNG) carriers to LNG Canada's \$40 billion processing and export facility currently under construction in Kitimat, British Columbia.

The contract and LNG facility will bring many career and employment opportunities for the community says Crystal Smith, Chief Councillor of the Haisla Nation. The Haisla are about 1,700 people with the majority living in Kitimaat Village on the south shore of the Douglas Channel.

When Smith was growing up there were few jobs options in the village or nearby Kitimat. "Now everything is changed, young people have career options I would never have dreamed of," says Smith.

*"The sky's the limit for my kids and grandson."*

The joint-venture partnership between the Haisla Nation and Seaspan is called HaiSea Marine, and is majority-owned by the Haisla. Employment and other benefits will also be available to the nearby Gitxaala Nation and the Gitga'at Nation through a transit agreement with the Haisla.

The HaiSea Marine contract involves the design, building and operation of escort tugs and harbour tugs and will require employing approximately 70 mariners and six onshore staff, plus other roles for employees of the partner organizations. "Our communities have lived on the ocean since time existed. It's very significant that we're able to bring more jobs back on the water," says Smith.

LNG is natural gas that is cooled to around minus 160 degrees Celsius and condensed so that it becomes a clear and odourless liquid. LNG Canada's 400-hectare facility at the mouth of Douglas Channel in Kitimat will have two processing units that will cool and condense



*The Haisla First Nation village of Kitimaat on British Columbia's north Pacific coast, Canada. Photo credit: John Zada / Alamy Stock Photo*

the gas for export markets in Asia. LNG tankers are very large and can carry enough LNG to heat 10 million homes for a day.

Open and transparent discussion with members was absolutely essential to getting 90 to 95 per cent support for the LNG project in a public referendum says Smith. "You can never get 100 per cent, but we'll try to address any concerns the best we can."

Spills were one major issue but experts were brought in to confirm that LNG quickly evaporates during a leak or spill. The construction of the facility also minimizes impacts on bird and fish populations and the local environment. "We've put a huge amount of effort and expense to ensure the environment is protected," she says.

This kind of fully open and accountable communication is not easy to do Smith acknowledged, but was essential to getting strong support for such a large-scale project. It took years of meetings and information sessions with community members including going to where members lived such as Vancouver, Prince Rupert and Terrace. "We wanted to meet face-to-face to answer their questions."

Any community considering a new project should make communicating with members their top priority she says. "You have to have those very difficult conversations."

The tugs are being built by Haisla Nation's partner Seaspan, which also has the largest pool of tug masters and engineers as well as state-of-the-art training programs. Escort tugs will guide LNG carriers approximately 160 nautical miles from Triple Island to the LNG Canada's facility in Kitimat. Harbour tugs provide berthing assistance as well as the transport of material and personnel. They would also be involved in marine emergency response, firefighting and oil pollution response.

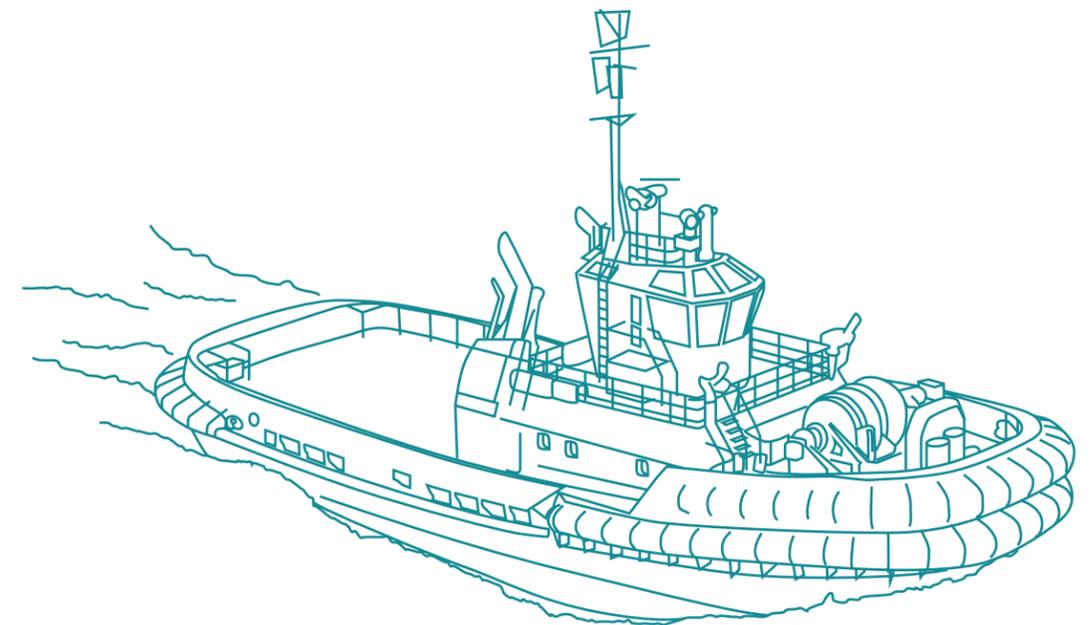
Commercial fishing and forestry jobs in the region have declined so there is huge need for new job opportunities. The Haisla have learned from previous economic developments that Smith calls "bad experiences of the past." So, they took a very cautious approach the entire project. LNG Canada and Coastal GasLink, which is building the gas pipeline to Kitimat, have taken the Haisla's environmental and other concerns seriously she says.

*"We've been calling this 'the new benchmark' in an industry-First Nations community relationship."*

The tugs won't be needed until the facility is completed a few years from now. Meanwhile, the Haisla have been focusing on developing the skills amongst community members so they are the first in line for the forthcoming career opportunities. "There will be all kinds of spin offs beyond the tug contract," she says.

There's already a big influx of workers, about half from local areas, for the construction phase. That's only the beginning of the influx of new people Smith says. "We're going to need more teachers, nurses, doctors and much more." At the same time, the community wants to maintain a careful balance between short-term benefits and any long-term impacts. "We're accountable to future generations."

**Best Practise:**  
*Shared Values and First Nation-to-First Nation Partnership*



## Coastal Habitat Restoration a Sustainable Business Opportunity

Members of the Confederacy of Mainland Mi'kmaq have been manufacturing and placing reef balls on the seafloor in the Northumberland Strait between Nova Scotia and Prince Edward Island to create artificial reefs that provide habitat for shellfish, fish, seaweeds and other marine life.

Reef balls are about the size of a beach ball, made of concrete, and honeycombed with holes to provide shelter and protection for lobster, crabs and other species says Anthony King, Coastal Restoration Project Manager at the Mi'kmaw Conservation Group.

“There’s a long-term, sustainable business opportunity for our communities in working to enhance underwater habitat and restoring living coastlines,” King says.

Building a wharf, enlarging a harbour or just about any kind of shoreline alteration often requires restoring some habitat elsewhere he explains. “Deploying reef balls is a great way to create habitat and it’s something we’re now capable of doing after putting 200 balls on the sea floor this summer just off shore of Pictou, Nova Scotia,” he says.

*“There’s been lots to learn since we started but we’re in this for the long haul.”*

The Confederacy of Mainland Mi'kmaq comprises eight member communities. In 2019, the Mi'kmaw Conservation Group (MCG) received \$1.2 million in funding through Fisheries and Oceans Canada’s Coastal Restoration Fund to build capacity to restore coastal areas and to create up to 13 new jobs over the course of four years. The funds are part of the \$1.5-billion national Oceans Protection Plan.

In addition to creating artificial reefs in the Northumberland Strait, MCG is working with partners to plan and monitor tidal barrier restoration work along the Bay of Fundy shoreline to re-establish salt marshes in the region.

“All of this work will be completed by using both the traditional lens and the western science lens so both knowledge sets combine into one collaborative effort to restore our lands and resources,” says Angeline Gillis, Senior Director for the Department of Environment and Natural Resources, the Confederacy of Mainland Mi'kmaq.

Doing any alteration along coastlines—even restoration work—requires a significant amount of paperwork and permits from various government departments. “It’s important to get an early start and know that it’s going to take longer than you expect,” advises King. Restoration is different from most shoreline projects so it’s important to provide as much information as possible he adds.

Reef balls are used around the world to create artificial reefs. King went to the Reef Ball Foundation, a non-profit organization in Tampa Bay, Florida, to obtain



Reef Ball. Photo Credit: The Confederacy of Mainland Mi'kmaq

moulds and be trained in reef ball construction and deployment. The MCG manufactured smaller-sized balls in the community so they could be deployed from their fishing boats.

“There’s a lot of moving parts in project like this. You need the right attitude to find solutions when you run into trouble,” says King.

The Bay of Fundy watershed project involves working with several partners to remove dykes in order to restore the natural tidal exchange and fish passage—and to increase salt marshes and other important habitats for species such as Atlantic salmon and American eel. Some 70 per cent of the region’s salt marshes have been previously lost. “Natural or living shorelines provide a range of benefits,” says King. “In addition to habitat, they reduce erosion and impacts of storm surges.”

MCG is involved in monitoring species diversity, water quality, and sedimentation rates and providing an overview of impacts as the restoration work progresses. King says they’ve had a big focus on capacity development and that one of their technicians has become an expert at identifying various species of grasses. “We’re still new at this, so asking questions of more experienced partners has been extremely important.”

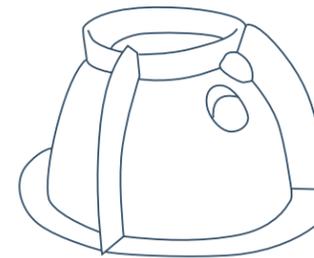
For communities considering similar restoration work King emphasizes the important of creating good partnerships. “It can be expensive to get started and there’s lots to learn. It helps to have someone who is good with logistics,” he says.

At the end of the four-year project, MCG will do a final report which will serve as a how-to manual they’ll be happy to share with anyone King concludes.

**Best Practise:**  
Using Two-Eyed Seeing (both Indigenous and Western Knowledge and Science) to Restore Resources



Photo credit: Mi'kmaw Conservation Group, The Confederacy of Mainland Mi'kmaq





## Fish and Aquatic Resource Habitat

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Fish depend on healthy habitat throughout their life cycle. This habitat is complex, involving specific water quality and quantity, temperature and oxygen level, aquatic plants and other sources of food and nutrients, as well as sufficient shade and cover from predators. Fish and aquatic resource habitat is within and around creeks, streams, rivers, lakes, estuaries and oceans.

When fish and aquatic resource habitat is damaged, it may take years to repair and restore. Habitat remediation and restoration are thus costly and time-consuming activities. There are also different approaches required to restore fish habitat depending on where the damage has occurred, such as a coastline or within a lake, or what has caused the damage, such as a forest fire or industrial run-off. The restocking of fish stocks after habitat has been restored is another complex component.

Habitat restoration is often viewed as a 'last chance' to fix degraded fishing areas which have historic and cultural importance to Indigenous communities and have played a key role in shaping oral histories and traditions. Habitat restoration is also a priority that Indigenous communities share with governments and industries across Canada. The economic and employment potential of this environmental management sector has in fact been coined as the 'restoration economy.'

Canada's *Fisheries Act* increased its focus on habitat restoration and the rebuilding of fish stocks when it was modernized in 2019. This legislation also incorporated the rights of Indigenous peoples and the importance of using Indigenous knowledge to inform decisions related to fish habitat.

Indigenous communities across Canada have been involved in habitat restoration, remediation and restocking initiatives for many years. This includes through Fisheries and Oceans Canada programs, such as the Aboriginal Inland Habitat Program and various Oceans Protection Plan initiatives, such as the Indigenous Habitat Partnership Program. Communities have also initiated their own habitat restoration and remediation plans using own source revenues as well as accommodation measures required as a result of Duty to Consult outcomes in various industrial project plans.

Two of these stories are featured in this section.

## Bringing the Eel River Back to Life

For the past nine years Ugpi'ganjig, a Mi'gmaq First Nation, has been working to improve habitat for Atlantic salmon in the Eel River on Chaleur Bay in northern New Brunswick. The community is located near the mouth of the Eel River and was formerly known as Eel River Bar First Nation.

"We've been recognized for our contributions to salmon restoration. We're not just taking fish, we're giving back and ensuring the next seven generations have access to this resource," says Chief Sacha LaBillois. Identifying someone in the community to champion the project, to get the funding and to manage it, was the single most important thing in the success of this multi-faceted, long-term project she added.

Ugpi'ganjig's Atlantic Salmon Habitat Recovery Project is part of a larger salmon and river drainage conservation and restoration plan following the removal of the Eel River dam in 2011. Built in 1963, the dam had a big impact on the health of the river and blocked passage for Atlantic salmon. Ugpi'ganjig's recovery efforts include rebuilding and restoring wild Atlantic salmon habitat and salmon stocks, and

public education and awareness of the importance of conservation to wild Atlantic salmon and its habitat.

The first few years involved removing blockages and obstructions in the river so the salmon could get upstream. Then, to re-build their numbers, the community installed in-stream fish egg incubators called scotty boxes. According to Chief LaBillois, these increase survival rates of salmon eggs to 90 per cent compared to the 5 or 10 per cent survival rate of the eggs in a natural setting.

*"We're among the first in Atlantic Canada to use the scotty boxes and they've worked very well. We're seeing a big boost in the salmon population," she says.*

Other actives include erosion site surveying, clam surveying and monitoring the salmon population using electrofishing. Special training and certification are required for personnel to do electrofishing since it uses direct-current electricity in water to catch fish so they can be measured and examined. Once this is completed, the fish are returned to the river unharmed.

Carole-Anne Gillis, Chief LaBillois and the Atlantic Salmon Habitat Recovery Project team. Photo Credit: Ugpi'ganjig First Nation



Working with other partners on the project was challenging, particularly when they have different priorities, continued Chief LaBillois. Electrofishing was often delayed because the community didn't have the equipment or the training, for instance. Working with outside consultants then became problematic since their values we're out of step with the community as they were not interested in capacity building. "We wanted to participate and learn to how to do the activities ourselves."

Fortunately, the Gespe'gawaq Mi'gmaq Resource Council (GMRC), a non-profit organization focused on aquatic research that is supported in part through Fisheries and Oceans Canada's Aboriginal Aquatic Resource and Oceans Management Program, was "very helpful" said Chief LaBillois. GMRC provided the electrofishing training, and Ugpi'ganjig was able to purchase the equipment. Carole-Anne Gillis, a biologist at GMRC, also provided training on all aspects of the project. "We've been able to develop capacity from within; our staff are very knowledgeable and certified, and can participate freely in activities as opposed to observing."

In addition to the Atlantic salmon habitat restoration, monitoring and re-population activities, the community has been doing clam surveys to assess the health of the Eel River. When the dam was removed, the few clams that could be found were extremely small. Now there are a lot of large adult clams in the river, which indicate that the restoration efforts are working.

Ugpi'ganjig has also been involved in public education efforts including a salmon awareness program at local elementary schools, community information sessions on salmon conservation, and a project booth set up at their community Pow Wow. In addition, the topic of salmon and salmon restoration has been woven into Ugpi'ganjig's ongoing comprehensive community planning efforts.

Community support, and willingness to help out when help is needed, has been important to the success of the project says Chief LaBillois. "We'd love to help other communities now, to form partnerships and brainstorm restoration ideas and help train others."

Ugpi'ganjig's Atlantic Salmon Habitat Recovery Project was a 10-year effort that concludes next year. The community is now looking for additional resources to continue their work to bring the Eel River back to full health and perhaps be able to continue to use their skills and knowledge in the restoration of other damaged river systems.

**Best Practise:**  
*Capacity Building through Training*



Technical training. Photo Credit: Ugpi'ganjig First Nation



## Grassroots Reconciliation through Habitat Restoration

Habitat restoration has become a form of ‘grassroots reconciliation’ in Ontario’s Georgian Bay region. “Take two people from very different backgrounds into the bush to plant trees together and they’ll discover how much they have in common,” says Larry Ferris, a citizen of Métis Nation of Ontario (MNO). “It’s no longer us or them. That’s why I call it ‘grassroots reconciliation.’”

Ferris, a former chair of Georgian Bay Métis Council, has been involved in a number of reforestation and habitat restoration projects over the past ten years. The work is done by a wide range of volunteers including Métis members, sports fishermen, environmentalists, youth groups and so on. “People love to help out,” he says. “They all want to work for the good of Mother Earth.”

Lake Huron’s Georgian Bay covers approximately 15,000 square kilometers, making it nearly 80 per cent the size of Lake Ontario. The Georgian Bay area has the largest concentration of self-identified Métis in Ontario. Under the Charter with the MNO, the Georgian Bay Métis Council (GMBC) speak for Métis citizens in the area.

The GMBC has played an important role in rebuilding natural habitat throughout the Georgian Bay area—as participants, planners and partners involving hundreds of volunteers. By restoring the health of streams and



La Villageoise LaFontaine Creek Stream Remediation before the plant.  
Photo Credit: Larry J. Ferris.

riparian areas, waters now run cold and clear and fish populations have increased. In re-forested areas, birds are now nesting in the trees, and turkey and deer tracks are on the ground.

Recently, GBMC worked on a stream reclamation project near the village of LaFontaine. Volunteers planted trees along the bank to help prevent erosion and to stabilize the soil. They also created a buffer zone between the stream and the adjoining farmland to protect it from runoff. The stream is part of the LaFontaine creek system, which is important for trout spawning.

*“It was especially nice to see youth out and involved with this project as they will be the protectors of these trees and this area in the future,” said Ferris.*

Previously GBMC youth and members helped different organizations plant about 10,000 trees at Simcoe County’s Millennium Tract, near Barrie. Native species were planted including traditional medicine trees, such as butternut and walnut, as well as other trees Métis ancestors would have valued, recognized and used. The butternut plantings also had an important role in preventing a proposed waste transfer center from being built in the reforested area said Ferris. Butternuts are an endangered and protected species in Ontario.

The GBMC is now well known for tree planting and remediating stream and fish habitats and have no trouble finding volunteers to do the labour. “We’re well organized, non-political and make sure everyone has a good time and are appreciated for doing this important work,” says Ferris.

Strong partnerships with a wide variety of organizations from governments and industry, sports fishermen and environmental organizations, among others, have been essential and co-operation has been “outstanding” he says.

The key to obtaining high-level co-operation from a wide range of people was getting involved in other organization’s projects. Ferris, who was a local member

of the Canadian Coast Guard, began volunteering with organizations and local clubs on their restoration projects. “I ended up saying that I had a lot of Métis friends who also wanted to help out.”

Eventually, Ferris set up a committee under the Council to do their own projects and to find sponsors to fund their work as well as work with other non-Indigenous groups. He said an important element to getting funding is a clear vision of what the end result will be: how planting trees and bushes along an eroded stream banks can improve water quality and trout spawning. Another key component is a clear, no-surprises plan about how much it will cost, the partners involved, and how to get volunteers out. “We want it to be a positive experience for everyone.”

One big group of volunteers are local youth. Many students are aware of environmental issues and want to do something to help Ferris says. Offering them a vision of how their restoration efforts will create new forests and mean more fishing opportunities in the

future is important. Equally important is giving them positive feedback and sincerely thanking them for their work he says.

Ferris takes a lot of pictures before, during and after the project to show what was done and how much fun the volunteers had. “I want people to see what they’ve accomplished.” He also writes articles about the projects and tries to get publicity. At the end of every project all volunteers and sponsors are invited to a big BBQ and thanked for their effort and support. It’s very important for people to feel appreciated he said.

These restoration projects have also been a great opportunity for sharing historical and cultural knowledge about the Métis. “So often people say to me, ‘I didn’t know that.’”

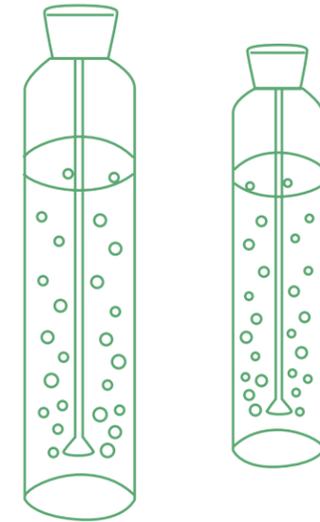
**Best Practise:**  
*Advancing Reconciliation through Shared Priorities*



La Villageoise LaFontaine Creek Stream Remediation after the plant.  
Photo Credit: Larry J. Ferris.

## Scientific and Technical Expertise

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Making sound management decisions concerning fisheries, habitat and oceans resources requires reliable science. The value of Indigenous knowledge in making resource management decisions is also recognized by federal officials and is now included in Canada's *Fisheries Act*.

Combined, using the strengths of western science and ways of knowing with Indigenous knowledge and ways of knowing is called 'Two-eyed Seeing' or *Etuaptmumk*. This guiding principle was brought forward by Mi'kmaw Elder Albert Marshall into the Integrative Science co-learning journey in 2004.<sup>18</sup>

Canada has a network of Aboriginal Aquatic Resource and Oceans Management (AAROM) departments, many of which have the expertise and capacity to deliver 'in the field' science and technical services in marine and fish-bearing waterways. Most groups have one biologist, and many have more than one, to serve the scientific and technical needs of their member nations.

They also have field technicians, environmental monitors, data collectors, and other technical staff and equipment to conduct research and complete other scientific and technical projects.<sup>19</sup> In some cases, AAROM departments have (or have access to) laboratories to test samples collected in the field and to do other research and studies.

Indigenous governments with modern treaties in Canada also support growing teams of scientists and technical expertise in their environment and natural resource departments. This includes in the North and the Arctic.

This section shows the diverse technical and scientific capacity of some Indigenous groups across Canada.

## First Nations-owned and -operated Science Lab Monitors Salmon Health

“Viruses are very difficult to grow. After all they’re not alive and can’t reproduce on their own,” says Chad Fuller, the Okanagan Nation Alliance (ONA) Fisheries Research and Diagnostic Biologist.

Infectious diseases in British Columbia’s wild salmon have contributed to their sharp population declines over the past thirty years. And disease is also believed to be hampering efforts to enhance salmon populations. However, little is known about the prevalence of viruses and other infectious agents during the various life stages of salmon.

That’s why Fuller is replicating fish viruses and other microbes at the ONA’s *kt c̓əlk̓ st̓im̓* lab in Penticton, BC: to monitor the health of wild salmon and ensure the health of salmon in the *kt c̓əlk̓ st̓im̓* hatchery. The lab has been operating since 2015 to provide a variety of services to the eight member communities in the Okanagan region to help increase the numbers of sockeye salmon. This year the *kt c̓əlk̓ st̓im̓* lab will establish a state-of-the-science Fluidigm BioMark™ technology that can test a single sample for 46 different microbes at once, dramatically increasing the lab’s capabilities.

Endangered chinook and sockeye salmon are considered keystone species, playing a pivotal role in sustaining the ecosystems where they live while supporting Indigenous populations for thousands of years. Salmon are also complex with seven different life stages and over 8,000 combinations of species and streams where they spawn in BC alone.

Last fall, scientists discovered three new viruses infecting wild and farmed salmon, one of which is related to respiratory coronavirus. This is no risk to humans, researchers emphasized. More troubling was one of the new viruses infected more than 15 per cent of chinook in hatcheries. This discovery was made possible through the use of BC’s one and only Fluidigm BioMark™ system found at Fisheries and Oceans Canada’s Pacific Biological Station, a research facility in Nanaimo.



Chad Fuller, Research and Diagnostic Biologist, *kt c̓əlk̓ st̓im̓* lab.  
Photo Credit: Okanagan Nation Alliance.

The Fluidigm high-throughput genomics testing allows rapid detection of genomes and enables researchers to search for a much wider range of pathogens at a lower cost than other methods. This makes it ideal for testing the distribution and prevalence of pathogens in both farmed and wild salmon.

“It’s quite an exciting tool,” says Fuller. The same Fluidigm BioMark™ technology is being installed this year in the *kt c̓əlk̓ st̓im̓* lab. The ONA has a highly successful history of restoring salmonid species in the Okanagan Basin and the lab has played a key role in that success since its creation. Now it will be the home of the first independent, First Nations-owned and -operated lab for pathogen monitoring, e-DNA processing, genetic stock identification, and chemical assays with funding from the BC Salmon Restoration and Innovation Fund.

The *kt c̓əlk̓ st̓im̓* lab is already being used to test samples of young salmon from industry hatcheries for piscine orthoreovirus (PRV) as a result of a partnership between ‘Namgis First Nation and the ONA.

This partnership is linked to a landmark Letter of Understanding signed in 2019 between First Nations in the Broughton Archipelago and the Province of British Columbia. Under the agreement First Nations will do independent scientific monitoring of fish farms in the Broughton Archipelago to ensure farmed fish meet First Nations health standards. Monitoring activities will occur over four years and will result in a considerable volume of samples to be analyzed and tested.

*“These investments will build technical capacity for First Nations communities,” says James Mack, Assistant Deputy Minister at the BC Ministry of Agriculture, Science & Policy. First Nations will generate the data themselves and obtain a better understanding of what’s happening in their territories says Mack.*

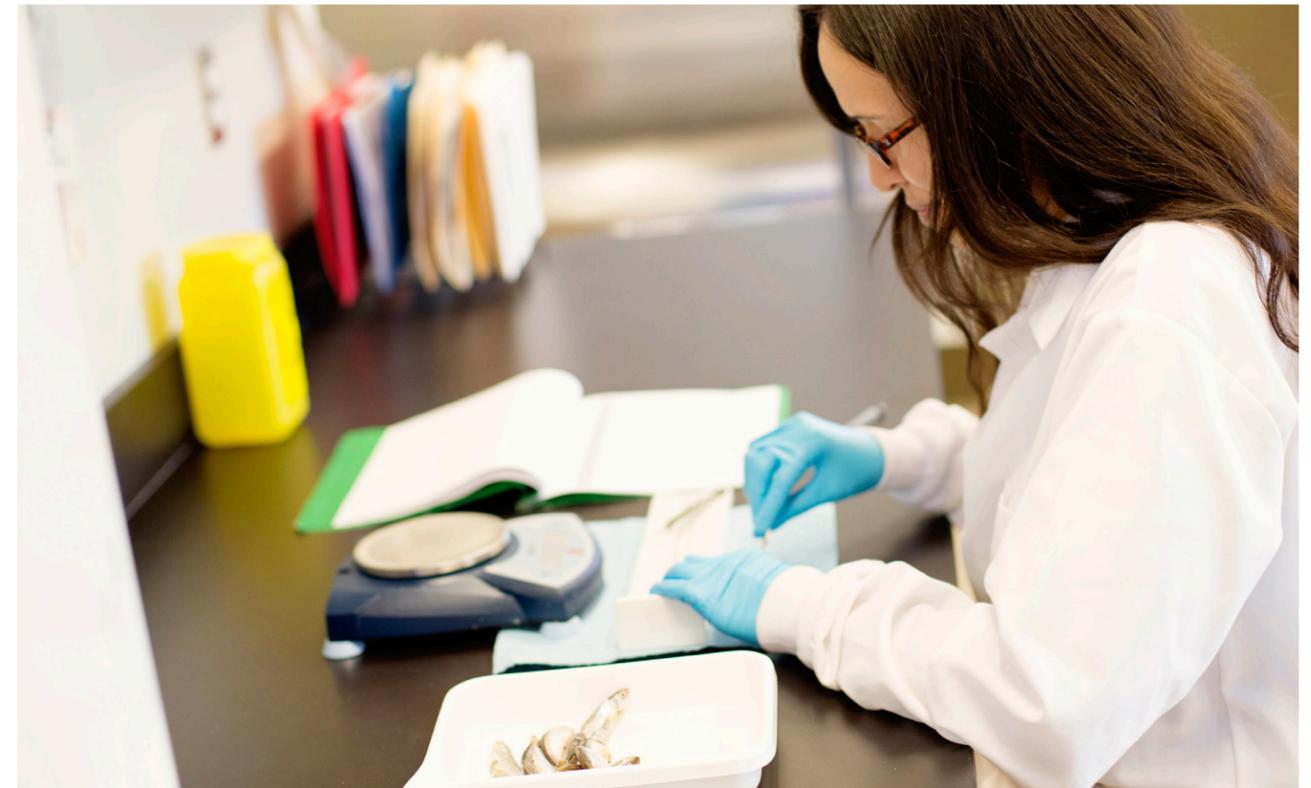
This cutting-edge science will be integrated with traditional ecological knowledge says Fuller. There is also a clear business case to build the expanded lab, rather than contracting it out. In same way it was more cost-effective to build the lab in 2015 to do the health monitoring of the ONA hatchery, he says.

Most importantly it will create jobs for local community members. “In collaboration with DFO, some of our people are being trained at the Pacific Biological Station,” he says. The Fluidigm technology for use on salmon was developed there.

With this technology, the salmon samples collected by the Broughton group can be screened for 46 pathogens and “that will give us a really good idea of the overall health of their fish,” says Fuller.

“When we’re up and running early in 2021 we will be able to provide health monitoring services for salmon and other fish species for many First Nations.”

**Best Practise:**  
*First Nation-to-First Nation Partnerships*



*kt c̓əlk̓ st̓im̓* lab technician.  
Photo Credit: Okanagan Nation Alliance.

## Researching a Commercial Fishing Future for Great Slave Lake

Great Slave Lake fish are not only “huge and massive, they’re the best tasting fish I’ve ever eaten,” says Patrick Riley, the environmental program manager for Kátt’odeeche First Nation in Hay River, Northwest Territories.

Unfortunately for the many Dene communities in the region, there is very little commercial fishing at present. However, that may soon change as community members collect reams of scientific data about the variety, abundance and health of the various fish species found in Great Slave Lake, one the world’s largest lakes and the deepest in North America.

*“The inconnu and other stocks have been in decline the last 30 years, but lake trout are rebounding,” said Riley. Inconnu or Coney is an oily-fleshed salmonid that can reach 25 kilograms and is in high market demand. “We’d like to find out why there have been declines using both western science and traditional knowledge.”*

Riley runs the community-based, capacity-building and collaborative aquatic resource management activities for Kátt’odeeche First Nation using funding from DehCho AAROM and the Aboriginal Fisheries Strategy program. AAROM is the acronym for Aboriginal Aquatic Resource and Oceans Management departments that are supported in part by Fisheries and Oceans Canada to address local concerns and issues impacting fish and the aquatic environment.

For Kátt’odeeche’s activities, crews of harvesters are trained to collect and process a variety of fish samples in Great Slave Lake and local rivers to help assess the productivity, genetics and population numbers. Typically, a DFO biologist is involved in this work, but this year the community’s collection crews did the work on their own says Riley. “They like the work and are happy to have a pay cheque while getting some fish for the pot.”

Meanwhile, the DehCho AAROM program has trained approximately 30 members to manage subsistence,

recreational and commercial fisheries in the DehCho communities around Great Slave Lake says Mike Low, the AAROM coordinator. Many are also Indigenous guardians who Low says are “the backbone of the communities.” DehCho AAROM has 10 First Nation community members, which are situated along and around the lake.

Until this technical work began little was known about the health of the lake’s fish stocks. “We’ve played a big role in changing this,” says Low. The work and the training have been very good for the community and the harvesters are quite knowledgeable. “Catching and consuming fish are very important in lowering the cost of living and for health reasons,” he says.

Under the DehCho AAROM program, Deh Gah Gotie First Nation runs a creel survey for the recreational pike fishery to collect data that is used to manage the stock. They are also involved in a monitoring project on the Horn River, which collects stock information on the walleye population. Another DehCho AAROM community, Sambaa K’e First Nation, has its guardians monitoring world-class walleye, lake trout and pike on a deep, cold water lake that is being affected by climate change.



Photo credit: Xinhua Zhu, Fisheries and Oceans Canada



Photo credit: Xinhua Zhu, Fisheries and Oceans Canada

DehCho AAROM is also involved in collecting fish from all subsistence lakes for mercury analysis. For example, Jean Marie River First Nation has found high mercury levels in subsistence fish stocks in locally fished lakes and, as a consequence, the community has been heavily involved in an ongoing research project.

In addition to managing fish stocks, DehCho AAROM runs fish enhancement projects, holds country food workshops, coordinates biomonitoring projects, participates in youth ecology camps, and conducts harvest surveys. They also collaborate with the Government of Northwest Territories to administer a DehCho community-based water quality monitoring program.

As for the future of commercial fishing, that is still a work in progress says Low. The few commercial fish harvesters are getting older and quota issues still need to be addressed. New fish harvesters will have to be recruited and the science must support the potential for long-term commercial livelihoods. “But our work is playing a big role in filling those gaps.”

**Best Practise:**  
Indigenous Collaboration



## Nunatsiavut Inuit Equal Partners in Labrador Sea Deep Ocean Research

Nunatsiavut Inuit of northern Labrador not only hunt and fish for living, they've become proficient at conducting scientific research in the Labrador Sea. In partnership with scientists, they are documenting the marine ecology in one of the least explored regions of Canada.

"The Labrador Sea is absolutely massive," says Rodd Laing, Director of Environment for the Nunatsiavut Government. The Inuit community relies on the Labrador Sea for food and livelihoods and is aware that what happens in deeper offshore waters can affect the near shore species, including seals and seabirds. However, very little ecosystem research has been done until recently, says Laing.

Known as one of the lungs of the ocean, the Labrador Sea is the left arm of the North Atlantic Ocean between Greenland and the coast of Labrador. It covers nearly 850,000 square kilometers and is up to 3,400 meters deep. It is one of the few places where oxygen-rich water at the ocean surface becomes so dense that it can sink up to two kilometers, where powerful currents transport it around the globe. The enormous amounts of oxygen breathed in by the Labrador Sea supports sea life thousands of kilometers away. And yet, little is known about life in its depths.

To learn more about the Labrador Sea's marine ecology, Fisheries and Oceans Canada (DFO) launched the Integrated Studies and Ecosystem Characterization of the Labrador Sea Deep Ocean (ISECOLD) in 2017. ISECOLD is being implemented in partnership with the Nunatsiavut Government and a number of research partners. Although the research is being conducted outside of Nunatsiavut waters, there is an agreement with DFO to co-manage areas beyond their land claim zone.

Nunatsiavut is an Inuit regional government created in 2005 with the signing of the Labrador Inuit Land Claims Agreement. It covers 72,000 square kilometers of northern Labrador, 65 per cent of which are coastal and marine areas that extend from Happy Valley-



*DFO research team sharing water sampling methods to sample environmental DNA with an Inuit youth group near basecamp of the Torngat Mountains National Park, Labrador.  
Photo credit: Fisheries and Oceans Canada.*

Goose Bay northwards to the eastern end of the fabled Northwest Passage. About 5,000 beneficiaries live in five Nunatsiavut communities within the settlement area.

Although the ISECOLD research is being done well offshore "understanding the deep marine ecosystem is critically important for planning and resource management," says Laing. There are many crucial issues facing the community such as whether fish and other species are shifting to new areas, the present and future impacts of climate change, and more he says.

ISECOLD is helping Nunatsiavut build its capacity to assist and conduct scientific research. Community members continued the research in 2020 on their own without DFO scientists because of COVID travel restrictions. Thanks to skills and training through the initiative, crews on local boats were able to go out and collect valuable data using various types of scientific equipment says Laing.

One of the local fishing vessels involved in the research is captained by Joey Angnatok, from Nain, who's long been involved in scientific research. Angnatok was the first-ever recipient of the Inuit Recognition Award for involvement in Arctic research.

"Joey and his crew have been doing crop-camera surveys and other data collection on their own over last year," said David Côté, DFO's lead researcher for ISECOLD. "Joey helps us pick study sites and knows where there is deep coral habitat to investigate," says Côté.

Inuit youth are often on board helping to collect and process the data. Youth are also involved in a near shore Arctic char project where they implant transmitters into char to track their movements, says Côté. "There's a lot technical capacity in Nain's Inuit community and that's helping to bring in new research projects."

The studies and papers that will come from the ISECOLD project will have Inuit traditional knowledge fully integrated. Collaboration with traditional knowledge holders is key and they will be co-authors on various papers. Traditional knowledge has as much to offer as scientific knowledge says Côté. "It's all data. No one source of data is better. And it's far better to have both types."

Respecting the culture and the needs and rights of the communities is also important for any researcher coming to the North says Côté. So is being flexible and learning to rely on the judgment of the locals.

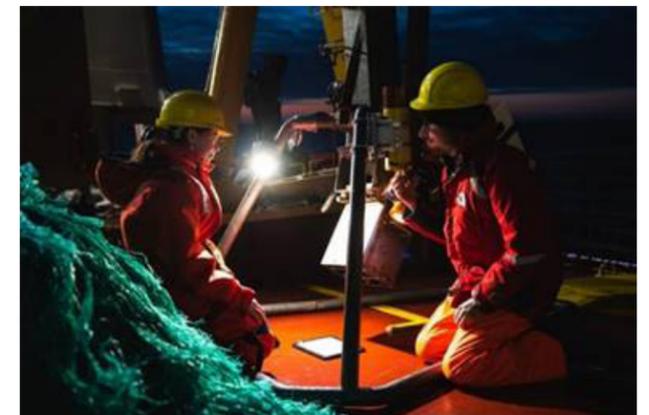
*"It's very expensive to do research in the North but if someone like Joey says it's not a good day to be on the water, you don't go," he says. "It's just as important to learn to accept what the land and sea gives."*

Building relationships with the community is essential and this takes time, and the ability to listen and learn, says Laing. Continuity is very important and Laing points out that Côté and his team have been coming here for many years. "There have been a lot of conversations and knowledge sharing that's built mutual respect," says Laing.

**Best Practise:**  
*Shared Priorities to Advance Reconciliation*



*Captain Joey Angnatok aboard his vessel the What's Happening.  
Photo credit: Tanya Brown.*



*Megan Dicker of Nain (left) setting up a drop camera to explore the depths of the Labrador Sea aboard the CCGS Amundsen.  
Photo credit: Alex Ingle.*

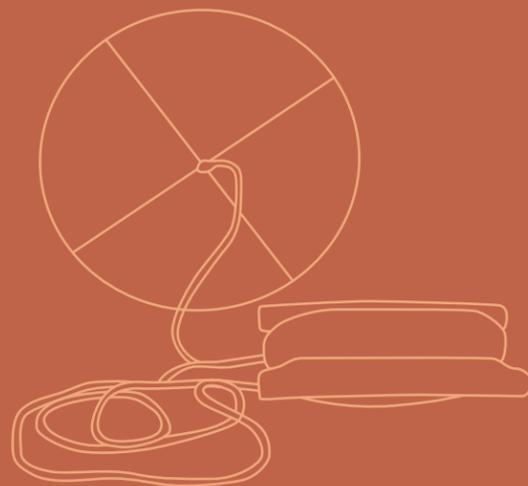


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Canada's fisheries and oceans sectors include public service employees at Fisheries and Oceans Canada who administer and manage programs and policies, conduct research and science, and serve to protect and manage the sustainable use of resources, among many other professions. Indigenous communities and governments have similar positions in their administrative offices and departments. There are also managerial, executive and science-based employees to run fishing enterprises, aquaculture operations, hatcheries, community fisheries, and Aboriginal Aquatic Resource and Oceans Management departments.

The similarities between employment positions in the public sector, whether it be for federal, provincial, territorial or Indigenous governments, enable opportunities for interchanges that can advance reconciliation and help to build closer working relationships. Interchanges, in particular, can help Indigenous and non-Indigenous partners develop a better understanding of each other's perspectives, values and world views.

Internships and mentorships are other valuable ways to build relationships. At the same time, these human resource tools can help organizations and communities prepare for staff replacements and succession planning. For Indigenous communities, mentorships are also closely tied to the transfer of knowledge not only for skills development, but to ensure cultural and traditional histories and ways of knowing and doing continue.

A few internship and mentorship programs are profiled in this section. They demonstrate both Indigenous-led and collaborative examples.



## Internships: More than a Summer Job

*The DFO Maritimes and Mi'kmaq of Nova Scotia Aboriginal Internship Program*

A unique internship for Indigenous students is helping to heal the broken relationship between government and Indigenous communities says a student participant in the Nova Scotia Mi'kmaq and Fisheries and Oceans Canada (DFO) internship program.

Now in its tenth year, the internship program has benefitted both the federal department and the 13 Mi'kmaq communities in Nova Scotia. Its success has also led to the development of a similar program in New Brunswick, which is now its fourth year.

Working as interns at DFO opens a window into the world of government while also providing government a window into the Indigenous world says Farrah Stevens, who participated in the Nova Scotia program during the summers of 2015 and 2016.

*“Indigenous interns teach the department’s staff the political structure of our communities, who we are as communities and how to engage with us,” Stevens says. And, based on her internship experiences, she was able to help her community learn how DFO operates and the breadth of those operations.*

Stevens looked to the department to gain some experience in the field of environmental stewardship while working on her environmental science degree. She now works in DFO’s Fish and Fish Habitat Protection Program where she interned. During those two summers, Stevens acquired technical knowledge. She also learned what it was like to work at a government agency which helped her pass the screening process to get her current job.

Stevens’ experience in the internship program is the fruit of a 2009 collaboration between the Assembly of Nova Scotia Mi'kmaq Chiefs and the Maritimes Region of DFO, with the support of Kwilmu'kw Maw-klusuaqn Negotiation Office. Not only does the program equip students with knowledge, skills and experience, it helps strengthen the working relationship between DFO and Mi'kmaq communities.



“Interns help communities understand that the department is more than an organization. It is a group of people who want to collaboratively work alongside First Nations,” explains Sophie Pitre-Arseneault, Manager of the internship program at DFO. “In turn, the program helps to build some strong bridges between the department and First Nations communities.”

This summer, at least four interns will participate in the program in Nova Scotia, and another two to four in New Brunswick. A total of 12 interns participated in 2019, the largest ever.

“I had so much hands-on training in my internship,” says Brontë Thomas who was a New Brunswick intern at the St. Andrews Biological Station in 2017. Even though Thomas was enrolled in psychology and sociology at university, and not marine biology, the station’s scientists would invite Thomas out on to research vessels or into their labs and welcomed all of her questions. “They were always so nice and so patient. I can’t say enough good things about the staff.”

The internship led directly to Thomas’ being employed in her Peskotomuhkati community to work on a number of projects, such as the Coastal Environmental Baseline Project. “We are looking at microplastics in the digestive track of American lobsters around the Port of St. John,” Thomas said. Lobster is a traditional food source and microplastics may be impacting their health.

“Every single day, I have applied what I learned as a DFO intern...it was probably one of the most enriching programs I have ever participated in!”

Thomas says her experience shows you do not need a marine biology background to intern at DFO because it is a diverse organization. The networking alone was a great benefit given the variety of people she met. This included fellow interns and people from different communities. Thomas says having these contacts have been very helpful in her current job.

*“I think the internship helps communities by showing Indigenous youth that there are opportunities outside the reserve,” says Melanie Hardy, a Nova Scotia intern during the summers of 2017 and 2018.*

For Hardy, one the keys to her successful internship was being made welcome and supported by DFO staff. “When you leave your community, you feel isolated and intimidated by the government environment,” says Hardy who has gone on to a full-time position as a data analyst in the Oceans and Ecosystems Science Division at the department.

Being made welcome also meant being able to work in different divisions depending on what best suited the interests of the intern. “I was always being asked if I was enjoying myself,” she said.

Interns also spend at least one week working in their community to learn some other hands-on skills and to share their experiences working inside the department. “We can bring our knowledge about the opportunities and diversity of DFO back to the community,” says Stevens.

An Elder advisor component was added to the internship program in 2019 to provide the kind of spiritual and emotional support interns would have in their own community. Although this was not in place during Hardy’s internship, she said it will be of great benefit. “A familiar face helps when you’re struggling,” she says.

“This is especially important when tragedy happens back in community and you have no one else local to talk to.”

To anyone interested in working for a government agency, the Mi'kmaq internship is a great opportunity to gain skills and knowledge. At the same time, it “adds diversity to the DFO workplace and is helping mend relationships,” Hardy concludes.

**Best Practise:**  
*Commitment to Reconciliation*



## Internship Boosts Indigenous Youth Interest in Science Careers

“If you don’t know, ask! Tell me what you don’t know,” biologist Jim Lane, told young science student Jared Dick early in his internship with Uu-a-thluk’s *Tomorrow’s Leaders Internship Program*.

Dick had pretended to know all about secchi discs, a white disc used to measure the clarity of water when it’s submerged. Lane, a Southern Region Biologist with the Uu-a-thluk aquatic resource and oceans management group on Vancouver Island, soon learned otherwise and gently encouraged the shy student to ask questions.

*“I have very fond memories of that moment,” says Dick, who is now an Uu-a-thluk Central Region Biologist.*

‘Uu-a-thluk’ is a Nuu-chah-nulth word which means, ‘taking care of.’ The organization is funded through an agreement between Fisheries and Oceans Canada (DFO) and the Nuu-chah-nulth Tribal Council, which represents fourteen First Nations along the island’s western coast. The focus of Uu-a-thluk is to increase Nuu-chah-nulth access to, and the management of, marine resources and to build the capacity of community members to find jobs and careers related to the ocean.

In 2006, Uu-a-thluk launched the *Tomorrow’s Leaders Internship Program* to mentor Nuu-chah-nulth science students in aquatic biology and shellfish aquaculture by developing their technical skills and having them attend important industry and community meetings.

Dick, who originally wanted to be a high school science teacher, changed his career path after his first summer internship. “I couldn’t believe that I was being paid to do the fun stuff in the field,” he says. By going to community meetings, Dick learned how his fieldwork with Jim Lane influenced decisions made by the tribal council. He soon realized how important Uu-a-thluk marine biologists are and wanted to be one of them.

During his second summer as an intern, Dick was given more and more independence, such as installing a counting fence on the Henderson River in order to count salmon. “I was asking more complicated questions, driving the boat a bit more, and doing more readings,” he says.

Through the internship, he obtained his radio licence and his commercial boat licence and, after graduating from university, Dick was hired as the Uu-a-thluk Central Region Biologist. His favourite memory of his internship is Jim Lane’s patient answers to all of Dick’s questions during the long car rides to meetings all over the island.

The *Tomorrow’s Leaders Internship Program* also opened Sabrina Crowley’s eyes to a possible position with Uu-a-thluk.

Crowley grew up in Uchucklesaht Inlet and had done a practicum with the Nuu-chah-nulth Tribal Council’s fisheries department. Crowley initially believed she’d end up working at her community’s oyster farm. However, the internship introduced her to a variety of different ways to deal with aquatic species says Crowley. “I was able to go on crab surveys with the nations, and there was a prawn survey...even a clam survey on one of the beaches,” she said.



Jared Dick, Uu-a-thluk Central Region Biologist.  
Photo Credit: Uu-a-thluk



Sabrina Crowley, Uu-a-thluk Southern Region Biologist.  
Photo Credit: Uu-a-thluk

In the Southern Region, Crowley worked with Jim Lane on a crab survey with Nuu-chah-nulth’s Ditidaht Nation because they wanted to figure out why the large pincers were missing from the crabs. “It’s neat being out there,” Crowley says. “You’re handling the crab, you’re measuring them, you’re determining their shell...counting how many females and males.”

*A favourite memory of Crowley’s internship was helping out with a sea otter survey. “There was this little baby sea otter and it was crying away and its mother came up and grabbed it and they just went under the water. He needed his mum to pull him under the water because they’re so buoyant when they’re young,” says Crowley. “There’s never a dull moment when you’re out in the field.”*

Like Jared Dick, Crowley was also able to see the importance of the data she was collecting in the field as it became part of community discussions and decision making.

“Being able to work with my community means a lot,” says Crowley. “You have a kind of awareness and compassion for some of the things that you’re doing because it affects you too. I know the connection we have to our resources, and being able to work with it just means a lot. You’re making a difference and you’re moving forward and you’re helping your own community out.”

The *Tomorrow’s Leaders Internship Program* has ended, but Uu-a-thluk continues to mentor Nuu-chah-nulth young people with an interest in fisheries and aquatic resources—and to provide opportunities for them to develop their careers through internships and term employment says Eric Angel, Fisheries Program Manager at Uu-a-thluk. “In other words, the *Tomorrow’s Leaders* program came and went, but we’re still doing the same thing,” said Angel.

**Best Practise:**  
*Succession Planning through Mentorships*



## National Mentorship Brings Connections and Benefits to Communities

“The mentorship is all about helping me learn and get better,” says Irene Gonneau of her time thus far as a research mentee at the National Indigenous Fisheries Institute (the Institute). “I am very grateful for the experience.”

Gonneau, a member of the Métis Nation of Ontario, says the mentorship is great because it is flexible and built around her abilities. With a Master’s degree in social work and strong research and analytical skills, she is also receiving assignments that are strengthening areas where she had little to no experience.

*“When I first started, I didn’t know anything about fisheries, so it was a steep learning curve,” says Gonneau who is now a Junior Communications Writer and Research Assistant mentee at the Institute. While she felt out of her depth in the beginning, the mentorship has provided the encouragement and support to be able to become a valuable contributor. “The Institute welcomed my ideas and opinions that come from my ‘fresh set of eyes.’”*

The National Indigenous Fisheries Institute promotes national consistency and standards across programs and practises related to fisheries, oceans, aquaculture, habitat and aquatic resource management. Its work is focused on maximizing the benefits of these programs and related activities for Indigenous communities across Canada.

“One way the members of our communities can benefit from fisheries and oceans programs is to have opportunities to learn about the issues and to work in real-life environments, under the guidance of persons with many years of experience,” says John G. Paul, Chair of the Institute’s Board of Directors. “Our mentorship program is one such opportunity.”

Participants in the mentorship work remotely, a challenge that is overcome with frequent communication and clear direction from the Institute’s mentor and the freedom for mentees to work independently. The flexibility of this working

arrangement is appealing to Gonneau, as is working remotely with people across the country. “That is really nice,” she says. “I find we all have in common a passion for Indigenous peoples and communities and the important role they play in our fisheries and oceans.”

The Institute’s mentorship has been an eye-opening experience in many respects says Keshia Moffat, a member of Ugpi’ganjig First Nation, which is located near the mouth of the Eel River on Chaleur Bay in northern New Brunswick. Moffat said she wasn’t aware how many First Nations communities there were in Canada. “BC alone has over 200 compared to 15 in New Brunswick.” She has also learned about the priorities of other Indigenous communities.

Moffat, who majored in science in university, is also the full-time Economic Development Officer for the Ugpi’ganjig. She did not have a lot of knowledge about



fisheries and oceans issues before the mentorship but thanks to the Institute’s resources and guidance from the mentor, Moffat has been able to dive in and learn what other communities are doing. This includes learning how to navigate government programs and their sometimes-confusing jargon, she says.

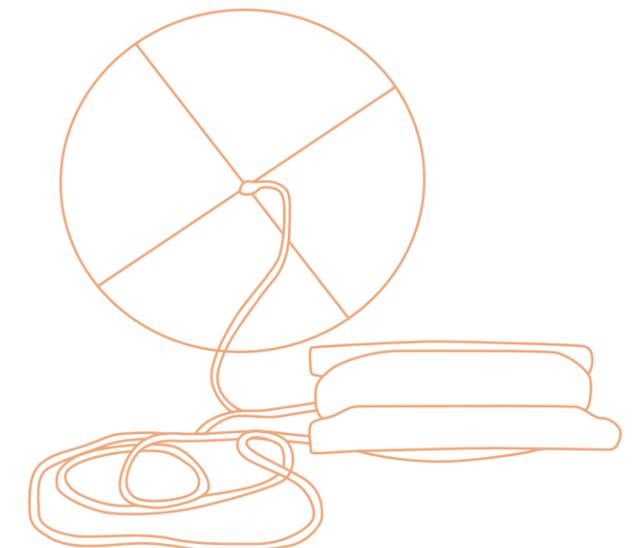
*“My mentorship is helping my community become more aware of the programs available and I can now explain what they mean,” adds Moffat. “Giving back to my community is very important to me.”*

For example, during her mentorship Moffat has learned about a community’s succession plan for fishery guardians and other Indigenous-led guardian programs that are empowering communities to manage ancestral lands according to traditional laws and values. Ugpi’ganjig has fishery guardians who make sure community members follow the proper protocols when fishing, as well as monitoring and weighing the catch. However, many of these guardians are ready to retire and there’s a need to help young people take their place. Based on this experience, Moffat now has a plan to bring to her Council. “What I really like is that my community job and my Institute mentorship are working hand in hand.”

The skills she is learning through the mentorship are also very transferrable to other areas of work. “I feel more confident now when doing any kind of research,” says Moffat.

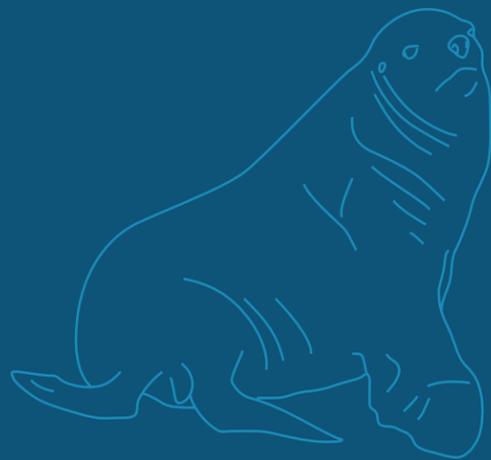
“It’s a great experience.”

**Best Practise:**  
*Building Capacity and Skills through Mentorships*



# Conclusion

62 Endnotes



Indigenous peoples are active participants in Canada’s fisheries and oceans sectors. Often, this participation began or continues today by working in partnerships with others. These partnerships are advancing reconciliation, generating employment, contributing to stronger socio-economic outcomes for Indigenous peoples, and benefitting the Canadian economy as a whole. At the same time, these partnerships are ensuring sustainable resource use that is based on Indigenous knowledge and science—and the protection of fish stocks, habitat and oceans for the benefit of future generations.

The *Compendium of Indigenous Socio-economic Best Practises in Fisheries and Oceans Sectors* features the ways in which Indigenous businesses, peoples and communities are achieving their social and economic goals by being involved in fisheries, aquaculture, processing, oceans, habitat, science, and administrative activities.



These are best practises:

- Sharing values and priorities, including to advance reconciliation*
- Adhering to community values*
- Being committed to sustainable resource use*
- Being committed to reconciliation*
- Adaptability to drive economic development*
- First Nation-to-First Nations partnerships and other Indigenous collaborations*
- Using training to build capacity and mentorships for succession planning*
- Using Two-Eyed Seeing (Indigenous and western knowledge and science) to restore resources*

By sharing these innovative and transferable socio-economic best practises, we hope that this compendium of features will inspire Indigenous communities, industry, non-governmental groups, governments, and others to embark upon new partnerships and collaborative activities.

## Endnotes

- <sup>1</sup> [www.dfo-mpo.gc.ca/stats/fast\\_facts\\_2019.pdf](http://www.dfo-mpo.gc.ca/stats/fast_facts_2019.pdf)
- <sup>2</sup> Statistics on gross annual revenues and employment do not include those being generated through the Northern Integrated Commercial Fisheries Initiative. Fisheries and Oceans Canada, Indigenous Affairs and Reconciliation Directorate, Commercial Fisheries programs, September 2020.
- <sup>3</sup> *The Marshall Decision at 20: Two Decades of Commercial Re-Empowerment of the Mi'kmaq and Maliseet*, Ken Coates, MacDonald-Laurier Institute, October 2019, page 4.
- <sup>4</sup> [www.dfo-mpo.gc.ca/fisheries-peches/sustainable-durable/fisheries-peches/species-especies-eng.html](http://www.dfo-mpo.gc.ca/fisheries-peches/sustainable-durable/fisheries-peches/species-especies-eng.html)
- <sup>5</sup> Aquaculture in Canada.
- <sup>6</sup> *First Nations and Aquaculture in British Columbia: Cultivating Change to Preserve Tradition*, First Nations Fisheries Council of BC, November 2016.
- <sup>7</sup> Statistics on gross annual revenues and employment do not include those being generated through the Northern Integrated Commercial Fisheries Initiative. Fisheries and Oceans Canada, Indigenous Affairs and Reconciliation Directorate, Commercial Fisheries programs, September 2020.
- <sup>8</sup> [www.dfo-mpo.gc.ca/stats/maritime/tab/mar-tab1-eng.htm](http://www.dfo-mpo.gc.ca/stats/maritime/tab/mar-tab1-eng.htm) and <http://www.dfo-mpo.gc.ca/stats/maritime/tab/mar-tab3-eng.htm>
- <sup>9</sup> [www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/statistics/industry-and-sector-profiles/sector-reports/british\\_columbias\\_fisheries\\_and\\_aquaculture\\_sector\\_2016\\_edition.pdf](http://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/agriculture-and-seafood/statistics/industry-and-sector-profiles/sector-reports/british_columbias_fisheries_and_aquaculture_sector_2016_edition.pdf)
- <sup>10</sup> Statistics Canada, 2016 Census of Population, Statistics Canada Catalogue no. 98-400-X2016359.
- <sup>11</sup> <https://lmi.fphrc.com/wp-content/uploads/2019/06/LMI-Atlantic-Canadian-Fish-and-Seafood-Final-Report.pdf>. (Permission received to reference information)
- <sup>12</sup> [https://gov.nu.ca/sites/default/files/files/fishing\\_in.pdf](https://gov.nu.ca/sites/default/files/files/fishing_in.pdf)
- <sup>13</sup> [www.wwf.ca/conservation/oceans/](http://www.wwf.ca/conservation/oceans/)
- <sup>14</sup> [www.dfo-mpo.gc.ca/oceans/soto-rceo/arctic-arctique/publications/infographics/page-01-eng.html](http://www.dfo-mpo.gc.ca/oceans/soto-rceo/arctic-arctique/publications/infographics/page-01-eng.html)
- <sup>15</sup> *Assessing Indigenous Capacity to Participate in Marine Spatial Planning*, National Indigenous Fisheries Institute, page 2.
- <sup>16</sup> [canada.ca/blue-economy](http://canada.ca/blue-economy)
- <sup>17</sup> <https://oceansupercluster.ca/>
- <sup>18</sup> [www.integrativescience.ca/Principles/TwoEyedSeeing](http://www.integrativescience.ca/Principles/TwoEyedSeeing)
- <sup>19</sup> *Indigenous Program Review: Phase One Final Report*, National Indigenous Fisheries Institute, May 2018, p.17.

*These features were written between January 2020 and February 2021. References to fishing seasons and 'years' should be considered within these timeframes.*

