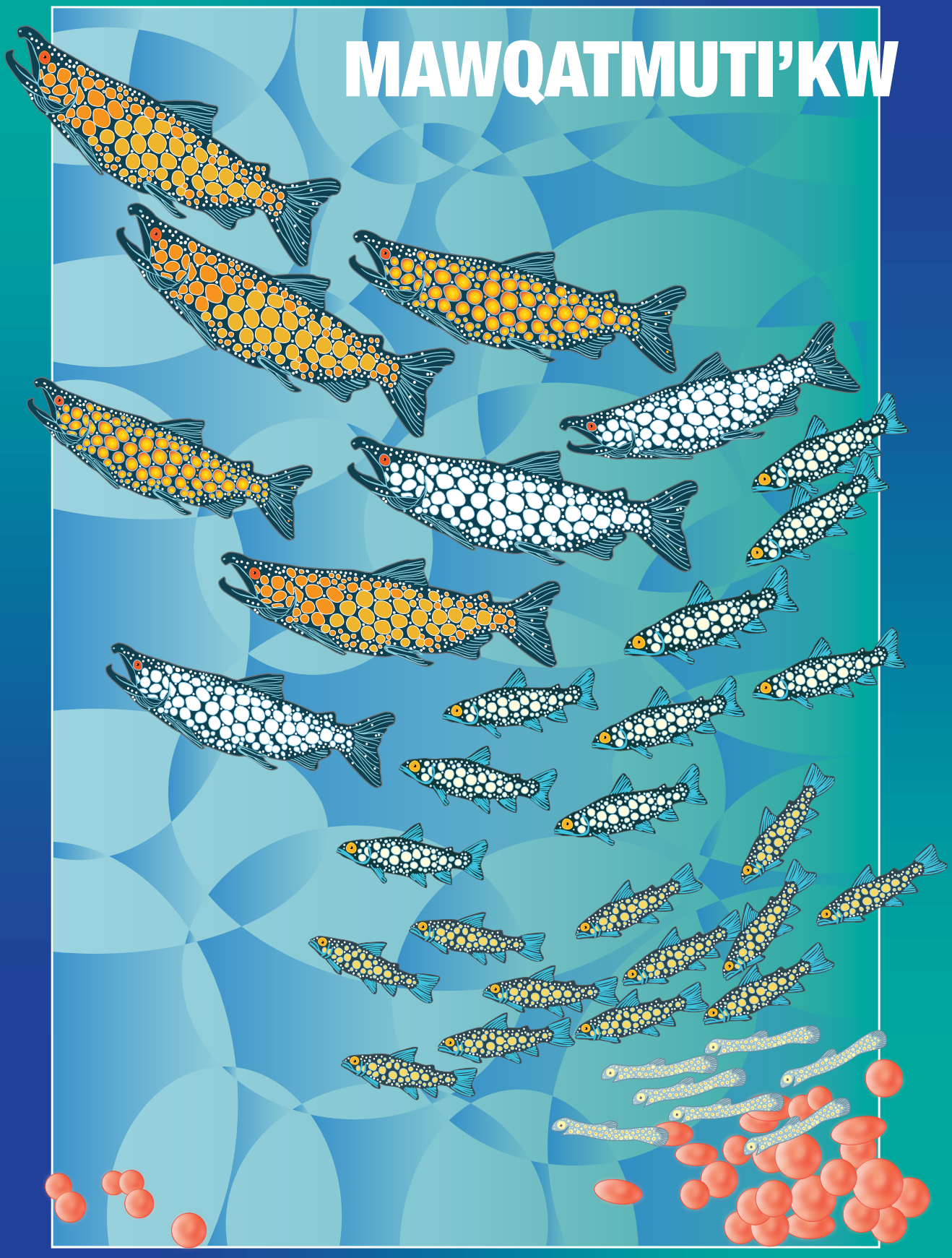
MAWQATMUTI'KW

OUR CONNECTION

When you see the smallest little blade of grass growing, that's hope. When you see the leaves in the trees, the seaweeds along the water, those are all hope. And I have a lot of hope for my grand-children and I will keep planting trees. I plant my flowers and my garden. There is hope in everything if we can just respect it and take it and use it.

Georgina Knockwood-Crane

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Sarah Spencer believes that all living things share natural principles that allow them to grow, stay healthy, be adaptable, develop resilience, become connected and pass on what they've learned. She maintains that if we can learn to access the wisdom of the forest we can live happier, healthier and more productive lives ourselves. Today, she tells us a bit more about her work and outlook on life...

mawqatmuti'kw

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Mawqatmuti'kw is also produced to feature articles and information about MAARS work to promote knowledge about aquatic resources, ocean management, communal commercial fisheries, collaborative partnerships and governance.

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NEWS FROM MAARS & MAPC

GUEST WRITER

Georgina Knockwood-Crane Interview: LOSS OF THE MOTHER TREES

by BRYAN MARTIN

Following the wrath of Hurricane Fiona in September 2022 many of us were left with a deep sense of sadness due to the major loss of trees and damage to the coastlines. Although the immediate need was to repair homes and barns, clear streets, and restore power, these were all things that would be accomplished within a (relatively) short period of time. Sadly, what we could not repair was our coastline, we could not replace our old grand-mother trees that have stood so tall for decades upon decades – those that have provided us with clean air and shade. Those of us who have a relationship with the land, who have a connection with a specific place or tree may be feeling some form of lasting grief, not unlike that of losing a close friend.

A few weeks after the hurricane, we had the opportunity to sit with a prominent community member and ask her perspective on that loss.

Below is an excerpt from that interview with Georgina Knockwood-Crane. Note that part of the original interview was in Mi'kmaq but that portion was not transcribed in this article due to my inabilities in transcribing it; however, it is available in audio format.

Thanks for being with us Georgina, and before we get started, can you tell us a bit about the name you were given as a child?

Kwe', my name is Mekwe'k Wowkwis Epit. Red-Fox Woman. When I was a little girl, my brother used to go across the river, down in Abegweit First Nations and go get our fire wood. This time he went up there, he was cutting wood but he heard this little barking in the woods, so he was crawling around the woods looking for this bark. It was a little fox but the mother was trapped, so he put the little fox in a bag and he got his wood and came back across the river and came home.

He said come here my little sisters. He said, I have this little animal in this bag, I want you to sit in a circle and I'll empty this bag. Whoever the animal goes to, that's your name, you are the keeper of that animal. So, I had my hands down, and the little fox, baby fox, came out and was running around and around and, he came and sat right beside me. So, he said, look at that. Little fox, that's your name Little Fox, Little Red Fox.

It's such a beautiful story, I had to have you share it.

We are here to talk about the aftermath of the hurricane, the devastation, can you tell me a little bit about how the land in this area may have changed in your lifetime, the landscape, whether that's the coastline or the forest?

I feel sorry for Mother Earth and our trees that fell down. Back in the day, my mother and my father, my aunties, we would go in the woods for our medicines, down by the shore. Muskrat root down on the riverbanks. I would get my mint tea, I used to go and get my rosehips and my golden threads. I would get all my medicines as my mum and dad taught me, I still did it. But for the last while, to me, the devastation started way back when they were clearcutting. That broke my heart. Because of the clearcutting, they took a lot of my medicines away. It was hard to go there and get my medicines because when they clear-cut, they actually disturb the roots of those medicines that I was getting. So that was heartbreaking. Then we had our first hurricane, Dorian, and she knocked down a lot of trees and it was hard for me to go in the woods because of all the trees that fell down, I couldn't go where my medicines were again. And now we had Fiona, and she was the hardest one we ever experienced in our lives. The devastation of just traveling down a dirt road I used to go down to get my medicines and seeing the trees laying down. Broke my heart. I couldn't believe, how they were all laying down. The old, old trees, that I used to go in the woods and hug. I would hug them and ask them for healing, I would hug them so tightly and I would say, you know elder tree, I come here for healing because I'm asthmatic and my lungs don't work good, not like they used to. I want you to let the wind come down and penetrate through your leaves and down through your branches and down through your bark and into my lungs. Let me heal, let me heal with your medicine. I would let it penetrate into my lungs, into my body, my spirit my soul, and I would feel so good because

Georgina Knockwood-Crane offers tobacco at tree planting ceremony. Photo by Bryan Martin

I knew that tree was healing me from the roots up through Mother Earth and all the way into my lungs. And when I saw what had happened, that she was laying down on the ground (pause). It…it was very hard. I had my grand-daughter with me, and…I stopped and I started crying and, I said oh no, my elder tree is laying down. And my grand-daughter, her Mi'kmaq name is Amalqat Mimikj. It means Dancing Butterfly. She said Grammie, you can still hug her, you can still get healed by her, come over and hug her. So I went over and I hugged my beach tree, and I held her really tight and I said, I'm so sorry you are laying down. You were so tall and you were so strong, and you healed me. And my grand-daughter, she asked if she could walk up to the top of her, so she walked up and sat there, and she was meditating. And I looked at her, and I thought, oh, that little has a great spirit in her. And she said Grammie, she told me to tell you that, any time you feel sick, to come back and hug her. To come back and visit her. That was the tree that fell down. When I look now, where I'm sitting right here, on my patio with you, I look down at my trees and some of them are laying down. I still have quite a few standing up but there are lot that are laying down. The ones that broke off half(way) are the ones that will continue growing, the ones that Mother Earth, that mother earth soil came up, those are the ones that are not going to grow. Those are the ones that are sad, the ones that I feel sad for because those are the ones that the whole roots were torn up, but when I see the other trees that are just laid down, those will continue growing and we are blessed to have that, we are honoured to see those trees. They will still grow and they will bring little ones and they will still grow.

It's interesting that you mention that because Nature is resilient, and Mother Earth is resilient, she can heal herself, it takes some time.

And my wife and I talked about this, and what's scary, what sad is that these events are happening more often, you mentioned Dorian was one of the first hurricanes that you remember, that was what, four years ago? These events seem to be happening too often and they are getting stronger, and that's what I find scary.

My father used to say, he said to me one time, he said, you know, my daughter he said, you know we take the boat across the river to NB, but some day we are going to see a bridge. That was way back in the '60's. He said someday we are going to be able to drive across. I said dad, I don't think they can put a bridge across there, he said, oh yes they will, I won't be around, and he wasn't when they made that bridge. And then he said to me, Daughter, he said you know they are clearcutting all our trees, he said, when they clearcut the trees, Mother Earth gets weak, because those trees have roots underneath the ground and they hold the earth, all over the island. They start clearcutting and the roots fall, the earth falls, we don't have trees to stop the heavy winds anymore. He said the winds will come and destroy us some day. And you know, my father was a very wise elder, and he was Gaqomotist Muin, Standing Bear, that was his Mi'kmaq name. And he said, when they start taking stuff away, like the earth, the trees, and he said, getting the little rivers and the streams, and building cement buildings in the city, they stop the water, they do it for the roads for the buildings, they are destroying Mother Earth, they don't realize what they are doing to the earth he said, so he said back in the past, we had a lot trees, we had a lot of brooks, a lot of fishing holes and hunting areas. We had a lot of stuff back then, Mother Earth provided for us, Nature provided for us, animals provided for us. but he said when they start destroying that he said, we're not going to have trees to slow

that wind down anymore, it will come in full force, it will start destroying stuff, and you know, to this day, it happened. It happened. And he talks about our water, he said we had water where we could walk out on the banks and fish and get all our fish and our food for the winter, now he said, the banks drop straight down and you can't walk down as far as you used to because of the destruction of the earth. That's what they are doing to us. And I believe, what my father told me back in the day, and to live today to see it. It's heartbreaking.

How do we get the message out, how do we tell people that, to leave the trees there, let's plant some more trees.

Chief Dan George was a beautiful, a beautiful actor, and he had a beautiful poem that he used to read: "Oh great spirits whose voice I hear in the winds". And people loved that poem because it talked about nature, it talked about the wind, the trees, the land, the leaves. And in every leaf and rock, there is our life, and these are the kind of people that has a message out there. It's us the human beings have to use our ears to listen, and our hearts to feel. Because if we don't do that and we live on to the computer and we live on to the cell phone and we live on to… destruction, then it's going to be destruction. If we live with our hearts and our soul and our mind and our eyes and our voice, then we can do something about it. Until then, it's very difficult to get someone to say, hey, you know what, this was a wake up call, for all of us.

Photo by Bryan Martin

Photo by Bryan Martin

All of us on PEI, it was a wake up call, even NS and NB, because we did not appreciate and respect Mother Earth, the trees, the leaves, the little insects to the birds that fly. We don't respect enough. We need to start respecting, we need to start appreciating what we have, or we are not going to have it someday down the road. Yeah, if we take too many trees out…yeah.

And that's the beautiful thing, and we were talking about this earlier when I got here, there are trees standing right up against your patio, up against the deck by the house, all around the place, and it wasn't cleared, and maybe that's why your place wasn't impacted so much by the storm. They have someone to lean on.

Absolutely. And you know, I respect the tree and I respect Mother Earth. I respect Nature, because I was taught back as a child how to respect. And I could hug the tiniest little tree and get such a feeling from it, from the biggest tree I might hug. But I respect that small little tree, because some day, I may not be here but, it's going to be a great big tree, and it's going to be somebody else that can hug that tree, and what we need to start doing is, as a Mi'kmaq person, I put my four medicines sage, sweetgrass, cedar, and tobacco down on Mother Earth and I say thank you, wela'lin. I say thank you Mother Earth for everything you give me, for food from the land, for the trees and the animals. You feed the animals and you feed me and I

thank you for that and I offer you my tobacco. And I do that every day and I smudge everyday, and I sing with my drum every day. And it's just my everyday healing. If I don't do it, I just feel as though my day is messed, I don't have that spiritual feeling inside me. We need to start thanking the earth and praying more.

When you mentioned little trees, it reminded me of a Greek proverb that says something like: "A society grows great when old men plant trees whose shade they know they shall never sit in". And I've personally seen you plant trees that your grand-children will enjoy, there were 30 or 40 people with us at a planting ceremony. Does that give you hope to see these tiny little trees?

Oh it gives me hope, cause hope is life right, hope is life and so is, ah, life for our children and our grand-children and their children, there is hope. And when you see the smallest little blade of grass growing, that's hope. When you see the leaves in the trees, the seaweeds along the water, those are all hope. And I have a lot of hope for my grand-children and I will keep planting trees. I plant my flowers and my garden. There is hope in everything if we can just respect it and take it and use it.

It's so wonderful to have the opportunity to spend a bit of time with someone who has such an appreciation for nature like this, thank you, so much, I really appreciate it.

Thank you. You're welcome, you're welcome.

Story Credit: by Bryan Martin, Maritime Aboriginal Peoples Council

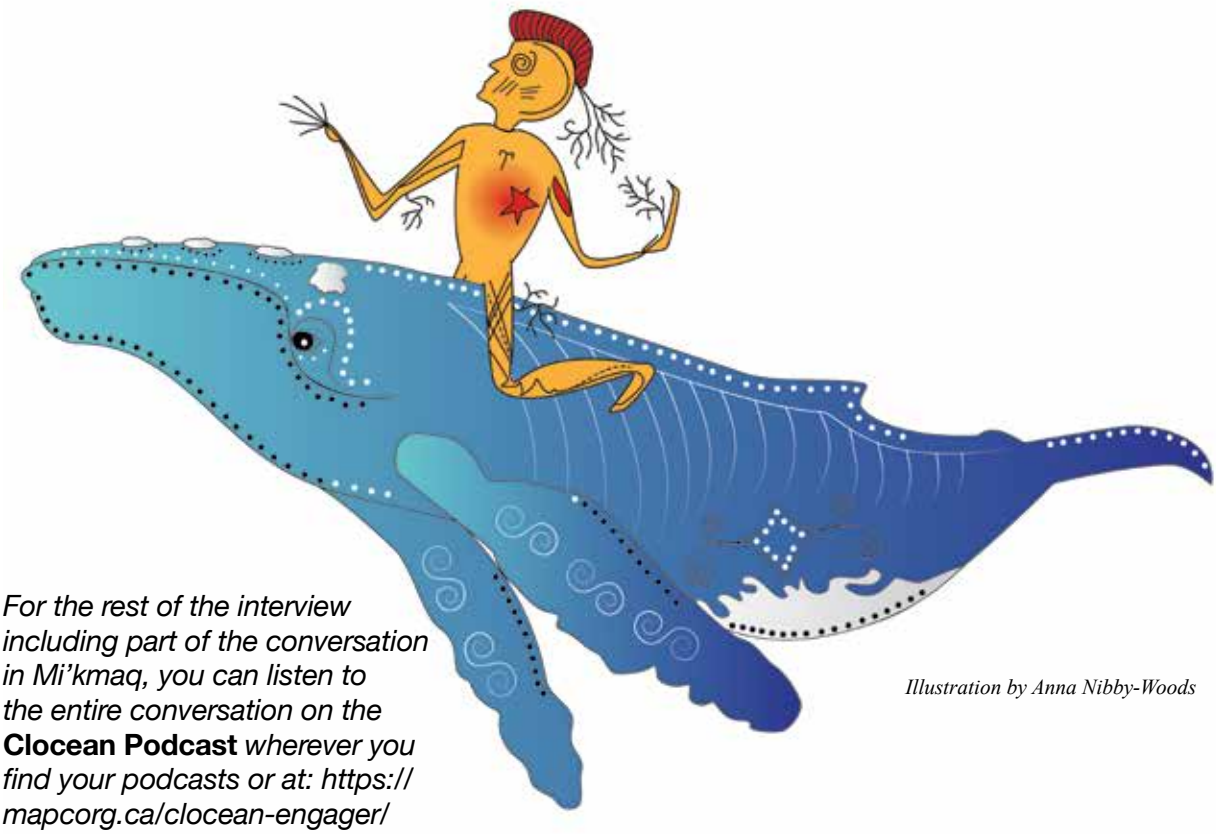

Illustration by Anna Nibby-Woods

For the rest of the interview including part of the conversation in Mi'kmaq, you can listen to the entire conversation on the **Clocean Podcast** *wherever you find your podcasts or at: https://mapcorg.ca/clocean-engager/*

INDIGENOUS PEOPLE THE LAST CUSTODIANS

by **BAHER KAMAL**

MADRID, Apr 29 2022 (IPS) - Every now and then, experts remind that the Indigenous Peoples are the best (and last?) custodians of the essential web of life: biodiversity.

There are more than 370 million self-identified peoples in some 70 countries around the world. In Latin America alone there are over 400 groups, each with a distinct language and culture, though the biggest concentration is in Asia and the Pacific– with an estimated 70 per cent.

And their traditional lands guard over 80% of the planet's biodiversity.

Although they comprise less than 5% of the world population, Indigenous peoples protect 80% of the Earth's biodiversity in the forests, deserts, grasslands, and marine environments in which they have lived for centuries.

Indigenous Peoples have rich and ancient cultures and view their social, economic, environmental and spiritual systems as interdependent. And they make valuable contributions to the world's heritage thanks to their traditional knowledge and their understanding of ecosystem management

They know how to connect with Nature

No wonder they play such an essential role: over the millennia, indigenous peoples around the world have developed practices that safeguard their environments and honour the interconnectedness of people and nature.

Their food systems are rooted in their environment. Living deeply intertwined with their ecosystems, imdigenous peoples have learned how to harvest and produce what they need sustainably, reminds, once

An ethnic matriarch in India's Sikkim State in the Himalayan foothills. Credit: Manipadma Jena/IPS

more, the International Fund for Agricultural Development (IFAD).

The Fund, which delivers grants and loans to the poor farmers and rural population worldwide, with nearly zero interest and the facility of repayment in long periods of time, also provides the following information.

For example, we've seen time and again that, when forests are governed by indigenous peoples, there's less deforestation and biodiversity loss. It's no wonder that their role as responsible environmental stewards has been documented on every inhabited continent.

Yet, they are more and more vulnerable

Yet indigenous peoples disproportionately struggle with poverty. In the 23 countries where most of the world's indigenous

peoples live, they make up 9.3% of the population, but over 18% of those in extreme poverty.

Meanwhile, IFAD explained on 22 April 2022, that their contributions are frequently 'overlooked and devalued.' All too often, indigenous peoples' communities aren't able to participate in economic and food systems without giving up their traditions and knowledge.

"They're left out of decision-making about the lands and resources they know better than anyone. They don't have the agency, financial resources or capacity to take charge."

Does anybody care?

And today, with climate change affecting every part of the globe, their knowledge and practices are more important than ever.

The Fund works with indigenous peoples to support them in overcoming poverty and showing the way to meeting global challenges through building on their identities and cultures.

But even when there is a plan: Policy on Engagement with Indigenous Peoples, and the International Fund for Agricultural Development converts its commitment into action through the Indigenous Peoples' Forum, the key role of indigenous people in safeguarding biodiversity is too often neglected, if ever taken seriously into account.

In fact, for the last 15 years, the Indigenous Peoples Assistance Facility (IPAF) has served as IFAD's flagship funding instrument for indigenous peoples, putting the power to find and implement solutions directly into their hands.

The IPAF aims at empowering indigenous peoples' organisations. It helps them access climate finance so they can direct funds where they see the greatest need, and promotes the implementation of indigenous peoples' rights frameworks, in line with the United Nations Declaration on the Rights of Indigenous Peoples.

Indigenous Peoples fight for the Planet

For its part, the World Wildlife Fund (WWF) has reiterated that by fighting for their lands, Indigenous peoples are fighting to save the planet.

Although they comprise less than 5% of the world population, Indigenous peoples protect 80% of the Earth's biodiversity in the forests, deserts, grasslands, and marine environments in which they have lived for centuries, WWF goes on.

"However, despite their critical role in ensuring a resilient and healthy planet for people and nature, there is very little acknowledgment of, or support for, their efforts, especially in Africa."

Our planet is facing a deep crisis rooted in a number of interconnected, global challenges that include infectious diseases like COVID-19, but also climate change, biodiversity loss, and financial collapse, according to WWF, one of the world's leading conservation organisations, working in nearly 100 countries.

"These challenges do not observe national or physical borders and primarily result from human activities such as deforestation, the burning of fossil fuels, the expansion of agricultural land, and the increased hunting and trading of wildlife."

Continuous non-recognition, abuse

Most of these activities are undertaken, habitually, in Indigenous peoples' territories

Brazilian Indigenous people during one of their regular protests in Rio de Janeiro demanding the demarcation of their lands and to be taken into account in environmental and climate measures. Credit: Mario Osava / IPS

without their free, prior, and informed consent, it explains.

"The continued non-recognition and abuse of Indigenous peoples' land rights, and consequently the dismissal of 80% of global biodiversity, should be placed at the centre of present and future global challenges."

Now, scientists, specialists and experts from all over the world are working to prepare for the UN Biodiversity Conference (COP 15), which is scheduled to take place later this year in Kunming, China.

Indedigenous Peoples will surely be present and their voice will be heard, but will it be 'listened to'?

Story Credit: By Baher Kamal, MADRID, Apr 29 2022 (IPS) - Inter Press Service (IPS), ipsnews.net

WHY INVESTING IN WATER, SANITATION & HYGIENE PAYS OFF

by **R. Loftus & M .Alexander**

LONDON / EDINBURG, Sep 23 2022 (IPS) - As the devastating images of flooding in Pakistan went round the world and the country declared a state of emergency, some 4,000 miles away in Stockholm, delegates had just arrived for World Water Week – an annual focal point for global water issues.

For lots of the international attendees, many of whom were from the corporate world, the headlines were a deadly reminder not only of the power and value of water, but also of the failings of the global system to manage it properly.

There can be no debate that Pakistan's latest flooding catastrophe has been exacerbated by the climate crisis. With COP27 on the horizon in November, and the UN Water Conference taking place in March next year, business leaders, governments, and key stakeholders must propel water issues to the top of the agenda and address them beyond the boardroom and throughout supply chains.

It's fair to say that the important role businesses have to play in securing sustainable access to water has often been overlooked. Having a safe, reliable, and resilient water supply is essential for most production processes and the health and wellbeing of employees – plus, it also makes sound financial sense.

At World Water Week, WaterAid launched its latest research 'Boosting Business: why investing in water, sanitation and hygiene pays off' to demonstrate to companies the business benefits and potential financial returns of investing in these facilities.

This pioneering, first-of-its-kind research was funded by Diageo, Gap Inc., HSBC, Twinings and ekaterra (previously part of Unilever). Research took place over four years, in four different countries, across four different sectors – including tea production, the clothing and

Moushumi Akter at work inside Fakir Fashion Ltd., Bangladesh. Credit: WaterAid/Fabeha Monir

leather industry and smallholder farming.

The WaterAid perspective:

The quantitative aspect of our pilot is vital as it's all about how and why investing in taps, toilets and hygiene behaviour change is good for business. We were able to not only carry out thought-provoking project work with tangible benefits for the workforce and wider communities, but we were also able to quantify how that then impacted upon productivity; how many jeans were sewn together, how much tea was picked, how much absenteeism fell, how much the companies paid on medical bills decreased and so on. We then extrapolated this data into standout figures – the return on investment (ROI).

In a nutshell installing clean water and decent sanitation facilities helps employees stay healthy. This means less absenteeism, lower medical costs, improved morale, and productivity. For every $1 invested in clean water, our research showed the apparel and leather sectors combined gained a $1.32 return on investment and the tea sector projects a $2.05 return.

To highlight the stand-out examples – one of the ready-made garment (RMG) factories in Bangladesh showed a ROI of $9 on every $1 invested in WASH, whilst in one of the Twinings' tea estate plantations in India, there was a $5 to $1 ROI during the pilot programme.

With continued investment over a ten-year period, the returns are even greater – indeed one of the RMG factories is projected to have $30 to $1 ROI – and if companies support their employees' communities as well, significantly more people will benefit.

It's important to also consider that some businesses will be put off by the initial capital expenditure, and the fact that the returns are not always immediate. However, low-cost solutions can often provide big results in the long-term.

Integrated within this is hygiene, which became a topic for board-level consideration during the pandemic and the sudden attention the world gave to enhanced handwashing has provided lasting impact as the first and most cost-effective defence against infection.

The key now is to think about how to maintain that beneficial shift in behaviour. Each workplace is different, but it's time for companies to put the wellbeing of their workforce at the heart of their business strategies and make water, sanitation and hygiene a priority.

The business perspective:

At Diageo, we strongly believe that, as access to clean water and sanitation are fundamental human rights, all efforts should be made to achieve this global goal. Access to water is central to gaining an education, sustaining health and increasing employability, and it addresses gender inequalities in communities, since women carry most of the burden of water collection.

We fully appreciate the enormous positive impact of investment in WASH and chose to be a key business partner in this ground-breaking study so we could finally prove the case for investment through solid research and data, and share the message with other businesses.

We will take the findings and incorporate them across our business strategies. The strong, quantitative evidence is what we need to support the investment in WASH facilities which play a key part of our Environmental, Social and Governance (ESG) action plan: Spirit of Progress 2030, and we now have the data and evidence to accelerate this work even further.

Future-proofing supply chains

Investing in water and sanitation facilities must be considered a core business priority and part of a water stewardship strategy, rather than an act of philanthropy or corporate social responsibility. No longer to be seen as a charity gesture, or a way of green-washing the business, but as a wise and smart way to future-proof: for communities and for businesses to thrive.

Businesses must now think beyond the immediate factory fence and look to their supply chains and to their employees' welfare within.

As more extreme weather events happen globally, and ever-growing populations mean increasing demand for water, more companies need to follow suit and have a greater presence on the global stage to address the crisis. Businesses have a vested interest in securing sustainable access to water, and now, a clear financial incentive to ensure lasting change.

If businesses, governments, and civil society rally together, important ESG criteria can be addressed, and sustainable development goals (SDGs) to achieve 100% access to safe and sustainable water, toilets and hygiene facilities by 2030, can be fulfilled.

**Ruth Loftus is Senior Private Sector Advisor at WaterAid and Michael Alexander is Global Head of Water, Environment and Agriculture Sustainability at Diageo.*

IPS UN Bureau

Story Credit: Ruth Loftus and Michael Alexander, LONDON / EDINBURG, Sep 23 2022 - Inter Press Service (IPS), ipsnews.net

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Indigenous Peoples Agenda: Demand Direct Financing at COP27

by **DANIEL GUTMAN**

SHARM EL-SHEIKH, Nov 12 2022 (IPS) - Indigenous peoples are no longer content just to attend as observers and to be seen as victims of the impacts of the current development model, at the 27th Conference of the Parties (COP27) on Climate Change. That is why they came to the summit in Egypt with an agenda of their own, including the demand that their communities directly receive funding for climate action.

Billions of dollars in aid funds are provided each year by governments, private funds and foundations for climate adaptation and mitigation. Donors often seek out indigenous peoples, who are now considered the best guardians of climate-healthy ecosystems. However, only crumbs end up actually reaching native territories.

"We are tired of funding going to indigenous foundations without indigenous people," Yanel Venado Giménez told IPS, at the indigenous peoples' stand at this gigantic world conference, which has 33,000 accredited participants. "All the money goes to pay consultants and the costs of air-conditioned offices."

"International donors are present at the COP27. That is why we came to tell them that direct funding is the only way to ensure that climate projects take into account indigenous cultural practices. We have our own agronomists, engineers, lawyers and many trained people. In addition, we know how to work as a team," she added.

Giménez, a member of the Ngabe-Buglé people, represents the National Coordinating Body of Indigenous Peoples in Panama (CONAPIP) and is herself a lawyer.

That indigenous peoples, because they often live in many of the world's best-conserved territories, are on the front line of the battle against the global environmental crisis is beyond dispute.

For this reason, a year ago, at COP26 in Glasgow, Scotland, the governments of the United Kingdom, Norway, the United States, Germany, the Netherlands and 17 private donors pledged up to 1.7 billion dollars

Artwor Representatives of native women from Latin America and other continents pose for pictures at COP27, taking place in the Egyptian city of Sharm el-Sheikh. Some 250 indigenous people from around the world are attending the 27th climate conference. CREDIT: Daniel Gutman/IPS

for mitigation and adaptation actions by indigenous communities.

However, although there is no precise data on how much of that total has actually been forthcoming, the communities say they have received practically nothing.

"At each of these conferences we hear big announcements of funding, but then we return to our territories and that agenda is never talked about again," Julio César López Jamioy, a member of the Inga people who live in Putumayo, in Colombia's Amazon rainforest, told IPS.

"In 2021 we were told that it was necessary for us to build mechanisms to access and to be able to execute those resources, which are generally channeled through governments. That is why we are working with allies on that task," he added.

López Jamioy, who is coordinator of the National Organization of Indigenous Peoples of the Colombian Amazon (OPIAC), believes it is time to thank many of the non-governmental organizations for the services they have provided.

"Up to a certain point we needed them to work with us, but now it is time to act through our own organizational structures," he said.

Latin American presence

There is no record of how many indigenous Latin Americans are in Sharm el-Sheikh, a seaside resort in the Sinai Peninsula in southern Egypt, thanks to different sources of funding, but it is estimated to be between 60 and 80.

Approximately 250 members of indigenous peoples from all over the world are participating in COP27, in the part of the Sharm el-Sheikh Convention Center that hosts social organizations and institutions.

From there, they are raising their voices and their proposals to the halls and stands that host the delegates and official negotiators of the 196 parties to the United Nations Framework Convention on Climate Change (UNFCCC), the organizer of these annual summits.

The space shared by the indigenous people is a large stand with a couple of offices and an auditorium with about 40 chairs. Here, during the two weeks

Colombian President Gustavo Petro (grey suit) poses for pictures with a group of Latin American indigenous people at the end of a meeting they held in Sharm el-Sheikh during COP27. CREDIT: Courtesy of Jesús Amadeo Martínez

of COP27, from Nov. 6 to 18, there is an intense program of activities involving the agenda that the indigenous people have brought to the climate summit, which has drawn the world's attention.

At the start of the Conference, a group of Latin American indigenous people were received by Colombian President Gustavo Petro. They obtained his support for their struggle against extractive industries operating in native territories and asked him to liaise with other governments.

"Generally, governments make commitments to us and then don't follow through. But today we have more allies that allow us to have an impact and put forward our agenda," Jesús Amadeo Martínez, of the Lenca people of El Salvador, told IPS.

The indigenous representatives came to this Conference with credentials as observers – another crucial issue, since they are demanding to be considered part of the negotiations as of next year, at COP28, to be held in Dubai.

The proposal was led by Gregorio Díaz Mirabal, a representative of the Kurripaco people in Peru's Coordinating Body for the Indigenous Organizations of the Amazon Basin (COICA), who told a group of journalists that "We existed before the nation-states did; we have the right to be part of the debate, because we are not an environmental NGO."

From beneficiaries to partners?

Native communities have always been seen as beneficiaries of climate action projects in their territories, channeled through large NGOs that receive and distribute the funds.

But back in 2019, the United States Agency for International Development (USAID) issued a Policy for Promoting the Rights of Indigenous Peoples (PRO-IP), which explores the possibility of funding reaching native communities more effectively.

Among the hurdles are that project approval times are sometimes too fast for the indigenous communities' consultative decision-making methods, and that many communities are not legally registered, so they need an institutional umbrella.

Experiments in direct financing are still in their infancy. Sara Omi, of the Emberá people of Panama, told IPS that they were able to receive direct financing for Mexican and Central American communities from the Mesoamerican Fund for capacity building of indigenous women.

"We focus on sustainable agricultural production and in two years of work we have supported 22 projects in areas such as the recovery of traditional seeds. But we do not have large amounts of funds. The sum total of all of our initiatives was less than 120,000 dollars," she explained.

Omi, a lawyer who graduated from the private Catholic University of Santa María La Antigua in Panama and was able to study thanks to a scholarship, said indigenous peoples have demonstrated that they are ready to administer aid funds.

"Of course there must be accountability requirements for donors, but they must be compatible with our realities. Only crumbs are reaching native territories today," she complained.

Brazil's president-elect, Luiz Inácio Lula da Silva, will participate in the second week of COP27, and this is cause for hope for the peoples of the Amazon jungle, who in the last four years have suffered from the aggressive policies and disregard of outgoing far-right President Jair Bolsonaro regarding environmental and indigenous issues.

"In the Bolsonaro administration, funds that provided financing were closed," Eric Terena, an indigenous man who lives in southern Brazil, near the border with Bolivia and Paraguay, told IPS. "Now they will be revived, but we don't want them to be accessed only by the government, but also by us. The systems today have too much bureaucracy; we need them to be more accessible because we are a fundamental part of the fight against climate change.

Eric Terena of the indigenous people of the same name, who live in southern Brazil, stands in the corridors of the 27th Climate Change Conference in Egypt. He is hopeful about President-elect Luiz Inácio Lula da Silva's return to power, but argues that indigenous peoples must have direct access to environmental and climate funds. CREDIT: Daniel Gutman/IPS

Panamanian indigenous activist Yanel Venado Giménez poses for a photo at the stand that indigenous peoples from around the world share at COP27, at the Sharm el-Sheikh Convention Center in Egypt. She leads a fund to help indigenous women, one of the few that receive direct financing for Latin American indigenous peoples. CREDIT: Daniel Gutman/IPS

"We see that this COP is more inclusive than any of the previous ones with regard to indigenous peoples, but governments must understand that it is time for us to receive funding," said Terena, one of the leaders of the Terena people.

IPS produced this article with the support of Climate Change Media Partnership 2022, the Earth Journalism Network, Internews, and the Stanley Center for Peace and Security.

Story Credit: Daniel Gutman, SHARM EL-SHEIKH, Nov 12 2022 - Inter Press Service (IPS), ipsnews.net

THINKING LIKE A TREE – A TRIBUTE TO LIFE SUSTAINERS

by **JAN LUNDIUS**

STOCKHOLM, Aug 24 2022 (IPS) - When I was a child, a friend asked me: "How would you describe a tree to someone who has never seen one?" I looked at the trees surrounding us and realised it was impossible, considering their versatility, beauty and utter strangeness. Since that time, I have often wondered about trees, as well as I have been worried by the indiscriminate destruction of trees and forests. Trees are a prerequisite for life and intimately connected with humans' existence. In these times of climate change, many of us are becoming increasingly aware of the life-promoting function of trees. How they produce oxygen, fix the carbon content of the atmosphere, clean and cool the air, regulate precipitation, purify the water, and control the water flow.

Throughout history, humans have been intertwined with the trees. Our shared cultural history bears witness to the fascination humanity has felt when it comes to the power and mystery of trees. Trees are present in many mythologies and religions: – Yggdrasil, the cosmic tree of Nordic mythology, Yaxche, the Mayan peoples' Tree of the World, the Sycamore, Isis' (godess of all feminine divine powers) sacred tree in ancient Egypt, Asvattha, the sacred fig tree in Southern India, the Bodhi tree, Tree of Awakening, among Buddhists, the Kien Mou, Tree of Renewal, among the Chinese, and the Sidrat al-Muntaha, Tree of the Farthest Boundary, in Islam.

The shape of the tree has for the human mind come to represent logical systems and helped us to bring order into chaos. As thought models we still use trees to depict genealogy, or explain the course of evolution and the grammar and origins of languages. Even our body structure seems to mimic the trees; skeleton, lungs, blood vessels,

Credit: Waldmüller

lymphatic vessels and neural pathways. We breathe through the tree-like network of the lungs – the bronchioles.

A walk through a forest can in a mysterious manner confirm our intimate connection with trees. If we are attentive enough, we might be seized by the feeling of another presence; incomprehensible, though nevertheless mighty and complete. It is as if the forest embraces us, observes us, speaks to us. The wind makes the forest foliage speak. Trees and bushes feed and protect songbirds and other animals. Trees thus contain the miraculous power of music – most musical instruments are made of wood.

There are several indications that our ancestors were arboreal creatures. Something our way of thinking and not least our physical constitution testify to – a flexible spine, extended arms and highly efficient hands. Claws have turned into fingernails and delicate fingertips. Our set of teeth and digestive organs have been adapted to food found among the trees – nuts, fruits, eggs, small animals. We have become omnivores and unlike cattle who feel the solid ground beneath their feet, and whose bodies have been adapted to it, human beings have developed their thinking, hearing, sight, and sense of smell to the unstable reality of tree crowns.

The creatures we descended from were constantly at risk of missteps leading to fatal falls, something that sharpened their minds and made them plan for uncertainty, danger and the unexpected. They learned to notice subtle, environmental changes and observe how other creatures adapted to them. They didn't feel safe in open landscapes, feared the

void, and only felt relatively safe if surrounded by the reassuring enclosure of greenery. We still prefer to walk among trees, rather than along sterile transport routes, filled with noise and air ollution, lined by ugly facades, supermarkets, industries, and parking lots.

The presence of trees pleases and calms us. A forest walk, or a restful time spent in a leafy park, invigorate us. Studies carried out in offices and hospitals have proven that people who do not have a view of and/or access to leafy surroundings are more prone to stress and depression, while sick people surrounded by a sterile environment, without an open view to greenery, recover more slowly than those who perceive the closeness of nature. Perhaps one reason to why older hospitals and sanatoriums generally were surrounded by tree-rich parks and flower plantations. It is energising to find oneself within a natural realm, far away from computer screens, plastic and concrete.

Contrary to humans, who generally exploit nature for their own benefit, trees take and give. They receive power and nourishment from the heat and energy of the sun, which through the photosynthesis is converted into oxygen and organic matter. The root system connects trees to earth's nutrients, which in the open are converted into leaves, wood, and fertilisers.

Trees make up the main part of the earth's biomass, both above and below ground. Through branches and leaves they create a maximum contact surface with the air and their wide-spread roots provide them with a firm anchorage, while helping them to assimilate nutrients. Trees support and provide for themselves, at the same time as they support and provide for the entire world.

A tree is never alone, it merges with its environment. It adapts to the atmosphere's mixture of gases and the earth´s subterranean water. Through a constant symbiosis with its environment a tree contributes to the creation and maintenance of its life- preserving substances.

Each branch and leaf adapt itself to the presence of its neighbours. Plants support each other. They unite death and life. Dead branches and leaves fertilize the soil, while roots and capillaries pump water out of the ground. A life-giving cycle that transforms, regulates and creates. Through evapotranspiration forested areas charge the atmosphere with water vapour and thus create rains, nourishing vegetation and replenishing the groundwater. Leaves capture part of the solar energy, which they transform into organic matter saturated with cosmic energy. The life cycle of trees is determined by the length of the days and varied temperatures. They constitute a living source, which flow of oxygen and nutrients is consumed by animals and humans. Furthermore, trees contribute to the formation of an ozone layer, which protects us from the sun's excessively strong ultraviolet rays.

Roots intertwine/communicate with other roots. Together with the mycelial threads of fungi, an underground life-promoting biosphere is created—the mycorrhiza, where bacteria fix nitrogen and supply the trees with minerals that otherwise would be difficult to obtain, such as phosphorus, magnesium, potassium, copper, zinc and manganese. If you give the plants nutritional supplements in the form of artificial fertilizers, they stop feeding the symbiotic fungi, which die and disappear. A growing tree becomes increasingly complex. Filled as its crown is with buds and new shoots it is constantly renewed. It spreads out and protects the earth. Flowers, leaves and fruits flourish within its crown. Trees are always directed towards the future. They are never completed, growing and developing in unison with the time

cycles of Cosmos. Quietly, they compromise with the forces surrounding them. The patient adaptability of trees is completely

different from humans' everyday life, which increasingly is built up from fragments in the form of e-mails, text messages and tweets, communication processes that alienate us from life, from closeness to nature and our fellow human beings.

The tree has an inner time, manifested through its annual rings. When we experience how a tree we have planted begins to grow we sense the future and gain confidence in it. Trees adapt to difficult conditions and can provide us with life and beauty. They meet our expectations.

Leaves are the elementary, structural and functional unit of a tree. A large tree carries millions of leaves diligently transforming light and water into matter and not the least fruits and seeds. Trees are firmly rooted in the earth, though that hasn't hindered them from spreading across the world. Their seeds break free from the anchorage of roots and branches, to be carried away by animals, people, wind and water.

Even though trees sustain life and provide us with joy and inspiration, we do not revere them. Instead, we abuse them, exploit them mercilessly, killing them for personal gain and profit. We have left the geological epoch of Holocene behind and entered Anthropocene (when everything is changed by humans). Even if we, against all odds, were to experience a population decline and if agriculture became dependent on sustainable farming methods, we have irreversibly altered our living conditions – the atmosphere, the hydrosphere and the biosphere. Is there any hope for humanity to survive? Can trees give us hope?

Many of us assume that tropical forests generate their abundance from fertile soil. But the soil they grow upon is generally quite poor and constantly washed by abundant rains. It is not on the ground that we find the greatest fertility, but in the tree crowns. Jungles believed to be primeval forests have often taken over land earlier used for agriculture. Large parts of the Amazon Forest were once populated by farmers who perished and disappeared through smallpox and other deadly diseases brought to them by the Europeans. Many of today's lush and abundant tropical forests grow upon on land that has been depleted either by rain, or intensive agriculture.

The adaptability of trees is amazing. Deserted land, even if it has been devastated by industrial/harmful mono-cultivation and/or once harboured forests subjected to reckless depredation, have demonstrated a remarkable ability to revive itself, creating hybrid ecosystems where life of the old kind mix with newly introduced plants while adapting to drastically changing environmental conditions. Such regenerated, self-planted forests exhibit an unexpected diversity of species that protect soil and plant life, fix atmospheric carbon, and begin to produce timber, wood and charcoal. For example, in the Brazilian District of Para, 25 percent of the area taken from the Amazon jungle has become forest land again and strangely enough its capacity to bind carbon dioxide is twenty times greater than that of the old forests, while birds and other animals have returned.

However, this cannot mean that we can continue exterminating earth's essential life-sustainers. i.e. trees and forests. Soon it will be far too late to save them, ourselves and our descendants.

Main source : Tassin, Jacques (2018) Penser comme un arbre. Paris: Odile Jacob.

IPS UN Bureau

Story Credit: Jan Lundius STOCKHOLM, Aug 24 2022, Inter Press Service (IPS), ipsnews.net

WAS COP27 A SUCCESS OR A FAILURE?

by FELIX DODDS & CHRIS SPENCE

COP 27 was both better and worse than expected, say Prof. Felix Dodds and Chris Spence. SHARM EL SHEIKH, Egypt, Nov 24 2022 (IPS) - It's finally over. After the anticipation and build-up to COP27, the biggest climate meeting of the year is now in our rear-view mirror. The crowds of delegates that thronged the Sharm el-Sheikh international convention center for two long weeks have all headed home to recover. Many will be fatigued from long hours and sleepless nights as negotiators tried to seal a deal that would move the world forwards. Did all this hard work pay off? In our opinion, COP 27 was both better and worse than we'd hoped.

Failing to Follow the Science

First, the bad news. COP 27 failed to deliver what the science tells us was needed. With the window of opportunity closing fast on our goal of limiting global temperature rise to 1.5C or less, COP 27 did far too little on the all-important issue of mitigation—that is, cutting emissions.

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The case for urgent action keeps getting stronger. The latest reports from the Intergovernmental Panel on Climate Change (IPCC) make for grim reading about what to expect if we let temperatures rise too much. Nowadays, though, we just need to read the newspapers to catch a glimpse of the future.

The head of the key negotiating Group of 77 – 134 developing countries – was Pakistan which has been dealing with the worst floods in its history, leaving 1717 people dead and dealing an estimated $US40 billion in damage. In 2022 in the USA, there were 15 climate-related disasters which each exceeded $1 billion in costs.

Egyptian Foreign Minister Sameh Shoukry, chair of COP27, reads the nine-page Sharm El Sheikh Implementation Plan, the document that concluded the climate summit on Sunday Nov. 20, to an exhausted audience after tough and lengthy negotiations that finally reached an agreement to create a fund for loss and damage, a demand of the global South. CREDIT: Kiara Worth/UN

Meanwhile, in Africa, according to Carbon Brief's analysis of disaster records, "extreme weather events have killed at least 4,000 people and affected a further 19 million since the start of 2022."

Since this COP was billed by some as the "Africa COP", one could expect a strong response to such news.

COP 27 failed to deliver what the science tells us was needed. With the window of opportunity closing fast on our goal of limiting global temperature rise to 1.5C or less, COP 27 did far too little on the all-important issue of mitigation—that is, cutting emissions

The pressure was therefore on at COP 27 to respond to such disasters. Attending COP27 were 112 world leaders and over 300 government ministers: not as many as at COP 26, but still a good number. Something like 27,000 people from governments, intergovernmental, stakeholders, and journalists also attended the COP. This was to the backdrop of the UN Secretary General warning us that we needed to "cooperate or perish," to take urgent action to take us off "a highway to climate hell".

Messing up on mitigation: And yet progress on mitigation was modest, at best. While some delegations pushed hard for stronger commitments on cutting emissions, the appetite in some quarters just didn't seem to be there. After being pressured to do more in Paris and Glasgow, China, India, and some of the oil-producing countries appeared reluctant to take much more in Sharm el-Sheikh.

They feel developed countries, which are historically responsible for the bulk of emissions, should be doing more themselves, rather than coercing others. The result was a negotiated outcome with little more on the table than we had in Glasgow. For instance, delegates could not agree to ramp up their language on fossil fuels,

For a meeting billed as the “implementation COP” where climate action was taken to another level, the news on mitigation and finance was disappointing. Credit: Shutterstock

much to many people’s disappointment.

Finance: Likewise, there was not too much to report on the issue of climate finance. The $US100 billion annual support for developing countries initially promoted by Hilary Clinton at the 2009 Copenhagen COP and enshrined in the Paris COP in 2015 will be reviewed in 2024 with a new figure being hopefully agreed then for 2025 implementation.

The Global South has been talking of this new sum numbering in the trillions to help adapt and mitigate against climate change. And yet there were few signs of movement towards anything of that magnitude.

Given that the North has still not met its pledge of US$100 billion by 2020, it’s clear a lot of movement is needed in the next couple of years. Yet news from outside the conference, such as the US House of Representatives now having a Republican majority, does not bode well.

For a meeting billed as the “implementation COP” where climate action was taken to another level, the news on mitigation and finance was therefore disappointing.

Just prior to the start of COP27 the lead negotiator for Egypt Mohamed Nasr underscored: “science reports were telling us that yes, planning is not up to expectations, but it was implementation on the ground that was really lagging behind.”

Exceeding Expectations—the Loss and Damage Fund

There were some bright spots, however.

Perhaps most surprising was the agreement to create a ‘Loss and Damage’ fund to help the most vulnerable countries. This has been a key issue for almost 30 years, particularly for small island developing countries.

In Glasgow this looked very unlikely to be resolved in the Sharm COP, but with a late change of heart by the Europeans and eventually by the USA and others in the OECD, this is perhaps the most significant and surprising outcome from COP 27. Even as recently as October, the signs were that OECD countries were not on board with calls for a new fund. However, at COP 27 the "trickle" of earlier action in this area turned into a flood.

Interestingly, it was Scotland at COP 26 that started things off, with a modest, voluntary contribution. More recently, Denmark, Austria, New Zealand and Belgium had also financial commitments to loss and damage, now amounting to $US244.5 million. Mia Mottley Barbados' Prime Minister has called for a 10% windfall tax on oil companies to fund loss and damage caused by climate change, which could raise around $US31 billion if it had been introduced for 2022. Still, the signs a fund would be agreed at COP 27 had not been good.

This makes the final outcome all the more welcome. The idea, the door is now open for the most vulnerable countries to receive more support. A goal has now been set to fully operationalize the fund at COP 28 in a year's time. For the most vulnerable nations, this cannot come quickly enough.

Global Goal on Adaptation: Another positive development, albeit on a more modest scale, was in the area of the 'Global Goal on Adaptation'. Here, delegates agreed to "initiate the development of a framework" to be available for adoption next year.

A lot of work will need to be done at the intersessional meeting of the UN Climate Convention's subsidiary bodies in Bonn in June next year to prepare for this, including how to measure progress towards this Goal. An approach similar to the development of the Sustainable Development Goals in 2015 might be appropriate, perhaps?

Article 6: Another of the Glasgow breakthroughs was that on Article 6 of the Paris Agreement on carbon markets and international cooperation. COP 27 saw some solid work undertaken on how to operationalize this both in market and non-market approaches.

There are still a lot of sceptics on this will have a genuine impact and how to ensure not double counting or even that any offsets are real. An approach that is more ecosystem-based than just trees is gaining momentum. Such a change, if it happens, also offers a real chance to link the two major UN conventions on climate and biodiversity.

Agriculture: The work on the Koronivia Work Programme on Agriculture went down to the wire. The outcome was a four-year open-ended working group reporting at COP31 (2026). Some controversy on the term 'food systems' may see its first workshop address this issue.

It will also look at how we can better integrate the programme's work into other constituted bodies such as the financial mechanisms of the convention. The Green Climate Fund has given only $US1.1 billion for adaptation on agriculture. It says one of the major reasons for this is the

"Lack of integrated agricultural development planning and capacities that consider maladaptation risks and investment needs across the agricultural sector, climate information services and supply chains."

While these outcomes on agriculture, adaptation and Article 6 may seem modest, they should be welcomed as steps in the right direction.

Coalitions of the Willing: One of the outcomes from the Glasgow COP was the launch of 'Coalitions of the Willing'; groups of countries and stakeholders wanting to move quicker on an issue than they might under the official UN negotiations, which are consensus-driven and involve more than 190 countries. In Sharm el-Sheikh we saw a number of countries join the Methane Pledge, including Australia and Egypt. China joined the meeting on the Pledge and committed to its own national methane strategy.

In Glasgow, 137 countries had taken a landmark step forward by committing to halt and

reverse forest loss and land degradation by 2030. With the imminent return to leadership in Brazil of President-elect Lula da Silva, there is renewed hope that real action on the Amazon forests is possible again. Lula committed Brazil to reaching zero deforestation and was hailed as a hero by many when he turned up at COP 27 during the second week.

Meanwhile, the Glasgow Financial Alliance for Net Zero (GFANZ)—the global coalition of leading financial institutions—committed to accelerating the decarbonization of the economy. GFANZ, which includes over 550 of the world's leading financial institutions, has committed to reduce their financed emissions in line with 1.5 degrees C.

With $US150 trillion of combined balance sheets, the accountability mechanism announced of a new Net-Zero Data Public Utility is yet to prove if it is effective in holding the finance sector to their commitments. However, if it can deliver on its potential, this could be a game changer.

There was plenty more activity at COP 27 where the results are harder to measure. Most people at these large UN climate summits are not negotiators and COP 27 was full of "side events" and government and stakeholder pavilions each with its own set of events and agendas.

Country pavilions provided a venue to talk about their challenges, issue pavilions on oceans, food, water, health, education, and resilience highlighted their issues and how they fit into the climate agenda. These enable critical issues to be discussed in a more open way than could be undertaken in negotiations.

Ideas were shared, connections made, and partnerships for further action shared. The upshot of all of this activity is hard to measure, but probably considerable. The thematic days organized by the Egyptian Presidency also gave space to these issues and helped bring together ideas that may ultimately find their way into future UN decisions. In this respect, too, the quality of the side events and pavilions at COP 27 exceeded our expectations.

On to Dubai and COP28

Was COP27 a success or failure? When it comes to keeping up with the science, the answer can hardly be positive. The call to "keep 1.5 alive" hangs in the balance and is still on "life support". In that sense, COP 27 had very little impact on our current trajectory, which is a likely warming of 2.4-2.8 C by the end of the century.

On the other hand, the promise of a loss and damage fund, as well as modest successes on adaptation, Article 6, agriculture, and actions outside the official negotiations, mean COP 27 delivered some bright spots of success.

Looking ahead to next year, COP 28 will be important as it marks the first "global stocktake" to judge where things now stand. We hope this will focus world leaders to increase their pledges (or "nationally determined contributions") significantly. It will be interesting to see how the United Arab Emirates, as COP 28 host, performs. As a major oil producer, it faces some serious challenges in transitioning to a net zero world.

At COP 27, there were rumours the UAE was ramping up its team and bringing in additional external expertise ahead of next year. This is certainly a good sign if COP 28 is to deliver the kind of groundbreaking outcomes the science now demands.

Felix Dodds and Chris Spence are co-editors of the new book, Heroes of Environmental Diplomacy: Profiles in Courage (Routledge Press, 2022). It includes chapters on the climate negotiations held in Kyoto (1997), Copenhagen (2009) and Paris (2015).

Story Credit: by Felix Dodds and Chris Spence, SHARM EL SHEIKH, Egypt, Nov 24 2022, Interpress Service News Agency (IPS)

HAVE YOU HEARD THE NEWS?

Mr. Roger Hunka, long-time Executive Director for the Maritime Aboriginal Aquatic Resources Secretariate (MAARS) has retired!

Roger has over forty-five years of administrative experience, including ten years as an adult educator and trainer. He has been directly involved as founder and/or partner establishing several non-profit, charitable, limited by guarantee and for-profit entities. The majority of these have been to accommodate and advance the social, cultural, educational, economic and political aspirations and needs of the Aboriginal Peoples of the Maritimes.

Roger has served as the National Bilateral Relations Director for the Congress of Aboriginal Peoples (CAP), the Director of Intergovernmental Affairs for the Maritime Aboriginal Peoples Council, the Director for the Maritime Aboriginal Aquatic Resources Secretariate, Producer of Mi'Kmaki: the Map, Mi'kmaq Language Learning Series, Mi'Mac Business Finder, and developer of Sedco Small Business Learning Series. He also

served as Executive Director for the Native Council of Nova Scotia for twenty years. Roger was President of Mi'Kmakik Development Corporation and has served as a Director on the Boards of several charities and not-for profit entities: MicMac Benevolent Society, WenjiKwom Housing Society, Ki'Knu Housing Society, and the Aboriginal Affairs Advisor to CAP, the Native Council of Prince Edward Island, the New Brunswick Aboriginal Peoples Council, and the Native Council of Nova Scotia.

Roger has extensive experience in public speaking, including presentations at local, provincial, regional, national and multilateral forums on: social/economic development, Aboriginal worldviews, the rights of Indigenous Peoples, and the evolution of the different generations of human rights.

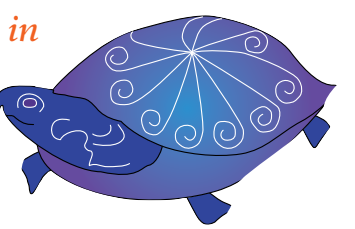
Roger's long history of involvement with Aboriginal Peoples, governments, and civil society has provided him with extensive knowledge about the Canadian Parliamentary form of Government, the Constitution Act of Canada 1982, Aboriginal Issues, and Aboriginal Peoples frustrations, rich history and aspirations.

Roger has been recognized and honoured several times over for his contributions to the advancement of Aboriginal Peoples in the Maritimes region.

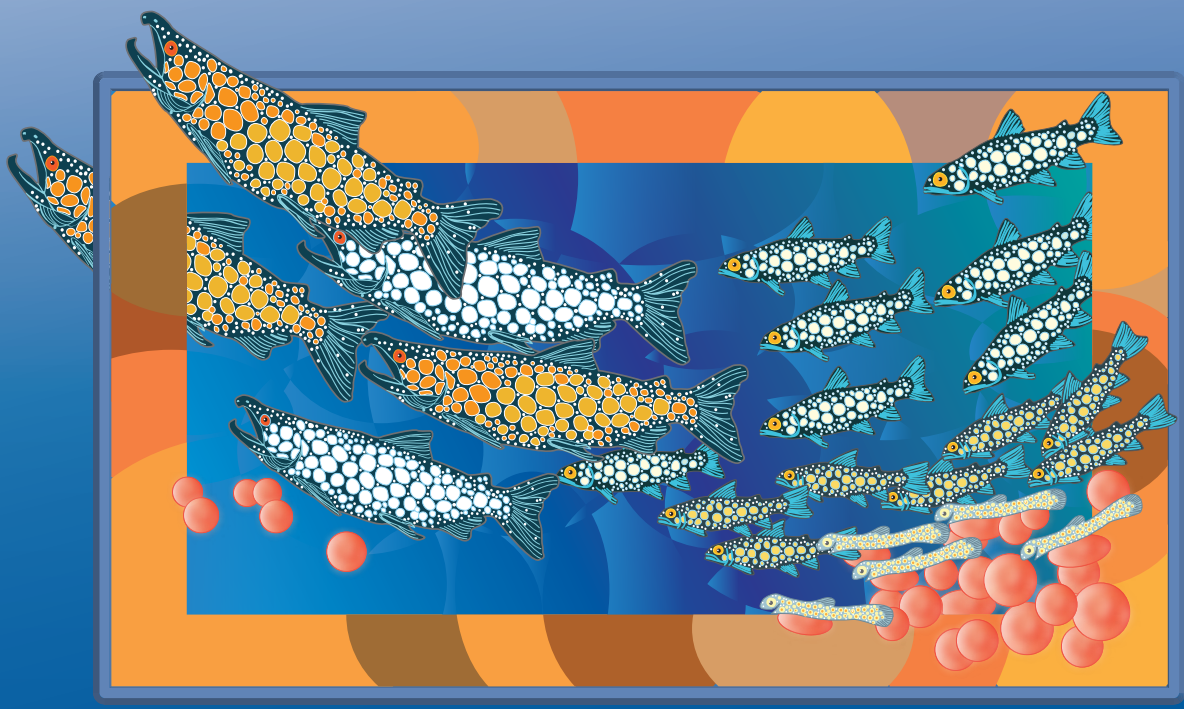
- Queen Elizabeth II Diamond Jubilee Medal, 2012
- Recognized by Premier John Savage for his Human Rights chairmanship -"Hockey Incident"
- Recipient of the Congress of Aboriginal Peoples "Aboriginal Order of Canada Award"
- Recognized by the Mi'Kmaq Grand Council on behalf of the Mi'Kmaq Peoples of Mi'Kmaki
- Honourary Member of the Native Council of Nova Scotia
- Honourary Member of the Native Council of Prince Edward Island
- Honourary Member of the New Brunswick Aboriginal Peoples Council

All of us here at MAPC, past and present, are immensely grateful for the guidance and expertise he has bestowed upon us over the years. Roger has two grown children, Rebecca and Robert John, who have blessed him with three young grand-children with whom he has more time to spend and enjoy.

Please join us in wishing Roger a happy and healthy retirement filled with joy!



NEWS FROM MAARS & MAPC



MARITIME ABORIGINAL AQUATIC RESOURCES SECRETARIATE

Illustration by Anna Nibby-Woods

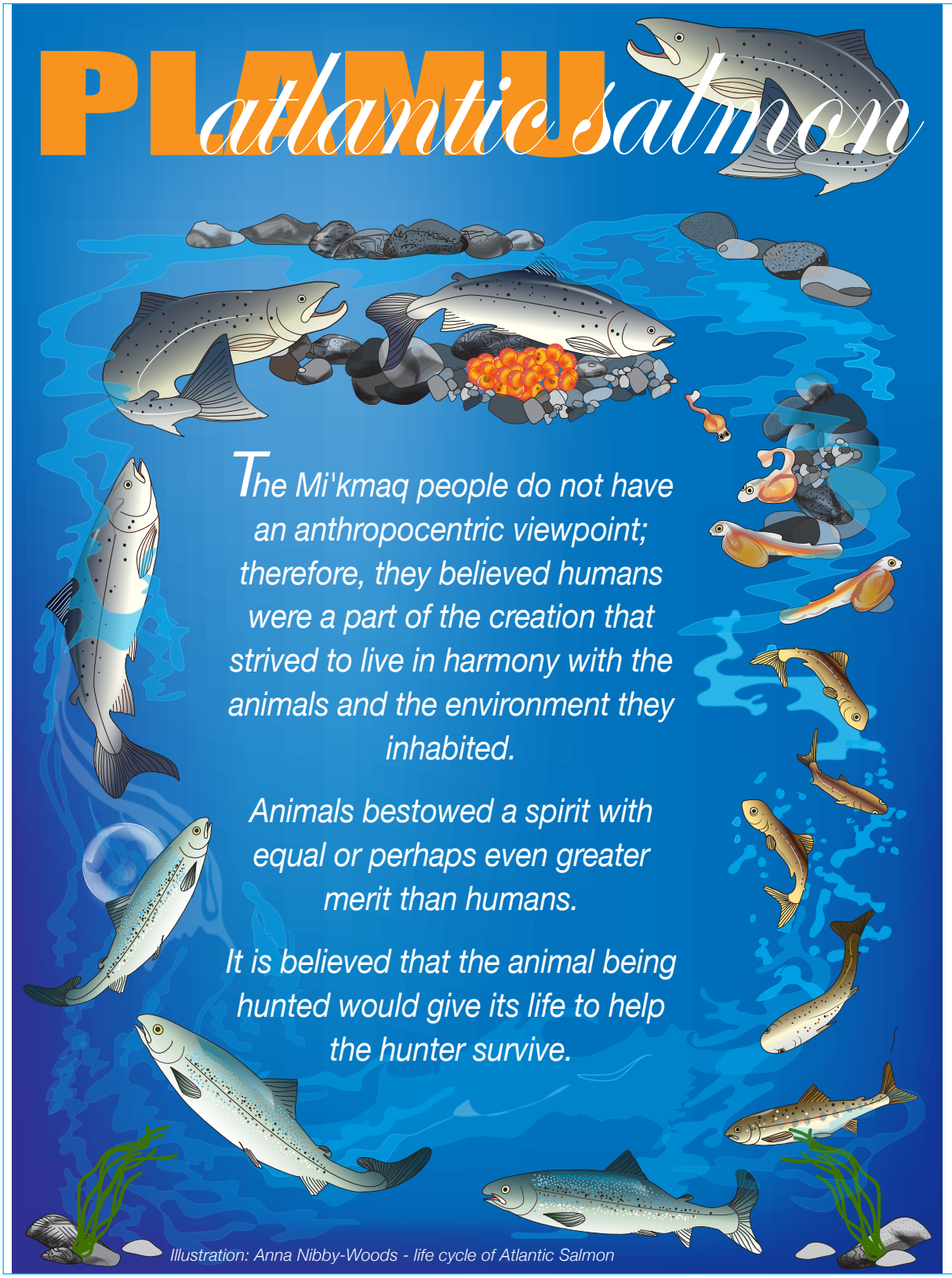
ATLANTIC SALMON AND THE MI'KMAQ - A REFLECTION- PLAMU

by Christian Woods

Growing up in a Mi'kmaq family, it has been instilled into me that you should only take as much as you need while leaving little to no waste. Everything you take from the environment is honoured as a gift from the Creator, and respected because every living being has a spirit endowed upon it by the Creator. When you took from Mother Earth, you would leave an offering to the Creator to pay your respects. For instance, when harvesting plants, we would leave tobacco offerings. When somebody harvested a moose, you would hold a ceremony for the moose's spirit so that it would make its way back to the Creator. When fishing, you would have a ceremony for the fish that were harvested, and return anything unable to be repurposed back to the water so that the fish's spirit could be recycled and there would be more fish. Nothing taken from nature is wasted because that would disrespect its soul, which gave itself up for you. This all ties back to the Mi'kmaq worldview.

This worldview is the primary reason the Mi'kmaq don't overharvest any particular resource; we hold a specific connection to the natural world. The connection to the animals and other living beings is a profoundly sacred spiritual connection. The Mi'kmaq people do not have an anthropocentric viewpoint; therefore, they believed humans were a part of the creation that strived to live in harmony with the animals and the environment they inhabited. Animals bestowed a spirit with equal or perhaps even greater merit than humans. It is believed that the animal being hunted would give its life to help the hunter survive. It also meant that if you were to abuse the animals through practices such as overharvesting, you would face spiritual reprisal. They knew that the misappropriation of natural resources would affect the ancestor's past, present, and future. The phrase "msit no'kmaq" is essential to the Mi'kmaq worldview. It means, in direct

PLAMU *atlantic salmon*



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It is believed that the animal being hunted would give its life to help the hunter survive.

Illustration: Anna Nibby-Woods - life cycle of Atlantic Salmon

Photo Credit: Gavin Scott, Portapique River (5 Watersheds Project) 2021

translation, “all our relations”. This relates to the interconnectedness of all living beings. The word Netukulimk roughly translates to "avoiding resource limitations”. It directly relates to the concept of sustainability and, in this way, stewardship of the resource is valued equally important as the harvest. Standard Netukulimk practices are cycling the harvested pools and imposing limits on which size salmon to gather on a case-by-case basis.

The Mi'kmaq lived too far north to depend on indigenous crops such as beans, corn, and squash. They took to the land and sea to hunt the animals. The Mi'kmaq received most of their meat from the sea, except for the winter seasons when they lived more inland. The Atlantic salmon was a staple food for the Mi'kmaq and one of their last harvests available before migrating inland for the winter. It was often smoked or baked over an open fire lined with rocks. It was seen as a recurring, dependable resource. The Mi'kmaq developed a close, sacred relationship with the salmon. Wild salmon is seen as a healthy food for its excellent nutritional content and is linked with increasing life longevity. The Mi'kmaq people

lived long, healthy lives on their traditional diets. The unavailability of traditional food sources such as Atlantic salmon has led to consuming processed, refined foods causing many health issues among the indigenous community.

For centuries before today, the rights of Indigenous Peoples to harvest the resources abounded to them by the Creator have not been respected. The Mi'kmaq people have always had a delicate balance with the beautiful fish. Colonization has not denigrated this balance completely, but has tipped the scales. Following the Anglo-Mi'kmaq war, the Crown signed several treaties in 1752 and 1760-61, calling back to the treaties signed in 1725-26. Those initial treaties said that the Mi'kmaq would not have their fishing, farming, or hunting interfered with as long as they kept peace with the British. These treaties were not designed to be the ceding of territory from Mi'kmaq to the British. Still, they allowed British settlement in the area and the sharing of resources between the Mi'kmaq and the British in the name of "peace" and "friendship", but also trade, as described in the treaty text. There have been, and still continue to be, significant challenges upholding the treaties; as such, co-management of the resources has fallen to the wayside. It became increasingly difficult for Mi'kmaq people to exercise their right to fish salmon. Today there is an evident absence of wild salmon; it is now consumed far less for general sustenance (due to conservation concerns) and is reserved more for celebrations such as a mawio'mi (a gathering, sometimes described as a "pow wow" contemporarily) and feasts where a large fish is desirable. When caught, salmon is often shared with elders and the sick. Sharing of food is an essential facet of the Mi'kmaq culture.

What led to the collapse of salmon populations? The leading factors are believed to be river water chemistry changes associated with industrialization, such as fertilizer, pesticide and herbicide use, acid rain, and runoff from mining. Siltation from open gravel pits and erosion leads to insufficient areas for nesting. Open-pen fish farming leads to genetically unfit salmon populations and causes a high prevalence of sea lice in often important migratory areas for salmon. Low marine survivability due to predation and growth inhibited by warming sea waters. Habitat structural changes are caused by practices such as clearcutting, fording and implementing hydraulic structures. The riparian zone is critical; it provides thermal refugia, cover from predation, and food web linkages and protects the riverbanks from erosion. Salmonids are sensitive to temperature, having a narrow range of temperature where they can adequately carry out their biological functions. In summer, many streams dry up, creating low water depths and almost stagnant water velocity, causing salmon to seek refuge in deeper colder pools, which become increasingly rare in the late summer months.

As a young Mi'kmaq person, I believe it is crucial that we, our children, grandchildren, and so on, for the next several generations, make an active effort to participate in and pass on the ways of traditional activities that so many generations before us partook in. Getting involved in the conservation world allows us to be active participants in the stewardship, restoration, and protection of the critical habitats that salmon inhabit. We can become involved in many ways: entering the field of environmental sciences, talking with our elders and youth, sharing knowledge and practices - the key is being present and open.

Story Credit: by Christian Woods, Environmental Technician, Maritime Aboriginal Peoples Council

ATLANTIC MACKEREL

by Kathryn Townsend

Description and Biology

Atlantic mackerel (Scomber scombrus) is a small forage fish found in schools in the epipelagic zone (from the surface down to around 200m) in temperate waters on both sides of the Atlantic Ocean. In the western Atlantic, mackerel range from Newfoundland and Labrador to Cape Hatteras, North Carolina. In the eastern Atlantic, mackerel are found from Norway around the British Isles to Portugal, as well as the Mediterranean and Black Seas. They spend the warmer months close to shore near the surface and migrate to deeper more southern waters during fall and winter.

Atlantic mackerel have a slender, streamlined body that tapers to a forked tail and a protruding lower jaw. Their backs are a metallic blue to green colour with dark, wavy, vertical bars. The metallic blue to green becomes a lighter silver on their sides and white on their belly.

Atlantic mackerel are oviparous (reproduce by laying eggs which mature and hatch outside of the female's body) batch spawners, with the females releasing eggs five to seven times during the spawning season. During that time, a single female mackerel can produce as many as 450,000 eggs. Spawning occurs near shore in the spring and summer, when the water has warmed to 13°C. Fertilized Atlantic mackerel eggs float in the surface of the water and hatch in four to seven days depending on the water temperature. Atlantic mackerel eggs, like most fish, hatch based on water temperature. When the eggs hatch, the larvae are roughly 3mm in length and are unable to swim. Instead larvae are carried around by the current near the surface of the open water, where they feed

Photo credit: NOAA, Atlantic Mackerel

mainly on their yolk sac. In approximately 40 days, the larvae will reach the juvenile stage and will be able to swim on their own. Atlantic mackerel reach sexual maturity around year 2 and can live to be 15 to 17. Juvenile Atlantic mackerel grow rapidly reaching 20cm in length within the first year. Mature size is typically 30 to 40cm, however, Atlantic mackerel have been recorded at 66cm in length. As adults, Atlantic mackerel feed mainly on copepods, krill, and shrimp, however, they also consume squid and other smaller fish depending on availability and opportunity. Unlike many of their relatives, Atlantic mackerel do not have a swim bladder and must swim continuously to breathe.

Atlantic Mackerel Fisheries History – 17th Century to present

Atlantic mackerel in the Northwest Atlantic have been harvested since the 17th century. During the 19th century a market was developed for salted mackerel in the United States. Originally using hook and line as far north as the Gulf of St. Lawrence, the American fishery converted to purse seine in the 1870s and began fishing closer to home. Fishing vessels were converted from sail to motor powered during the early 20th century giving rise to a market for fresh mackerel.

In 1884, the American fishery had a total allowable catch (TAC) that had reached a high of 105,700t, but by 1910 had dropped to 5,700t. By the late 1930s, Canadian landings exceeded 18,000t, but declined to 5,459t by 1961. Due to the lack of market for mackerel during and after WWII, American landings declined rapidly. American landings fluctuated between 500t and 4,000t in the 1950s and 1960s.

Due to the development of a fishery on overwintering Atlantic mackerel stocks, carried out primarily by large freezer and factor trawlers from the USSR, Poland, East Germany, and Bulgaria, catches increased astronomically during the late 1960s. Domestic vessels typically use gillnets, handlines, purse seines, and traps. In the early 1970s, overall landings ranged from 300,000t to 400,000t. In 1977, with the establishment of the Exclusive Economic Zone (EEZ) and the introduction of Canada's 200-nautical mile jurisdiction, foreign fishing was reduced, and therefore, catches and landings declined. From 1965 to the early 1980s Canadian landings averaged 20,000t each year. In the early 1980s, agreements between Canada, the United States, and the Commonwealth of Independent States occurred, allowing catches to rebound, peaking in 1988 at close to a combined 90,000t for both countries. From 1990 to 1999, Canadian landings ranged from 16,000t to 26,000t. In 2000, Canadian landings dropped to approximately 9,000t with nearly 63% of all catches comprised of fish one year of age (from the 1999 year class). The lack of market for small fish (~27cm) resulted in fishers reducing fishing activities, effort, and landings. Reported commercial landings in Canada decreased from 54,700t to 8,600t from 2005 to 2013. In 2015 landings reached a record low of 4,272t. For several years, Atlantic mackerel TAC was not being reached, however, in 2016 the TAC (8,000t) was reached and was surpassed in 2018 (10,000).

Atlantic Mackerel Fisheries Science

Atlantic mackerel is harvested within the Canadian and United States EEZ's and is managed by the corresponding governments. In Canada, all fisheries are regulated under the Department of Fisheries and Oceans (DFO). Since Atlantic mackerel do not have a swim bladder, population assessments (spawning stock biomass cannot be conducted using acoustic surveys, as is typically done for commercial fish species, instead populations are estimated via egg surveys and commercial landings data. The spawning stock biomass index of Atlantic mackerel has continued to decline since 2005 and as of 2018 is approximately one twentieth of biomass levels observed in the 1980s. Egg survey indices and commercial landings in Canada and the United States have all decreased significantly over the past decade and the stock is currently believed to be overfished. In 2020, the spawning stock biomass was the lowest ever assessed and the stock has been at or near the critical zone for over 10 years. In 2022, DFO announced a closure of all Atlantic mackerel commercial and bait fisheries in Atlantic Canada and Quebec for the 2022-2023 fishing season, to allow the stocks to rebuild. The closure does not include recreational fishing of which DFO does not know or record the landings.

Atlantic mackerel are not only an important commercial species, they also serve a critical role in the marine food web as prey for higher trophic level species, including large fish, marine mammals, and sea birds. Lack of Atlantic mackerel in the food web could have severe impacts on the ecosystem's sustainability.

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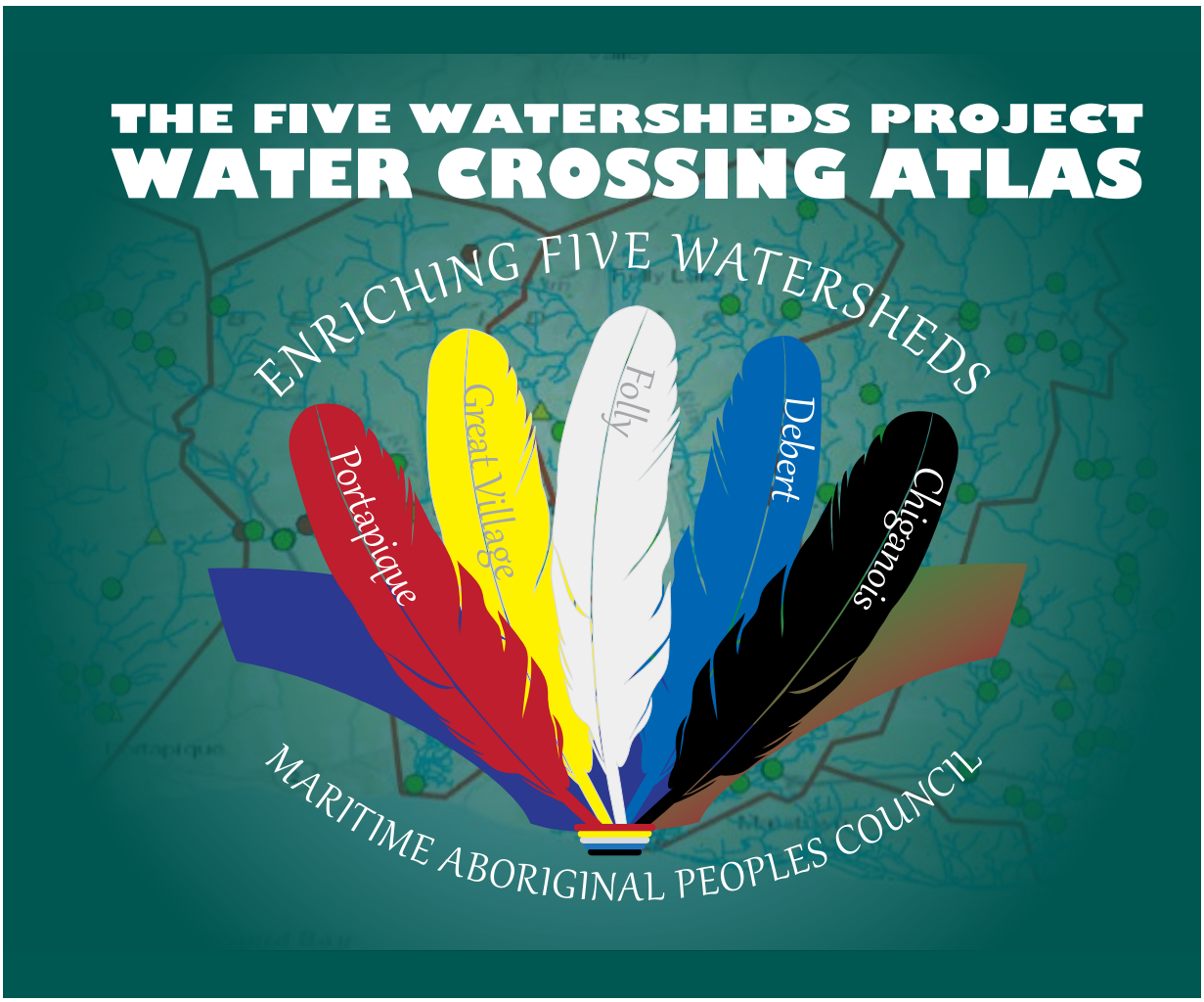
Story Credit: by Kathryn Townsend, Aquatic Resources Manager, Maritime Aboriginal Aquatic Resources Secretariate, 2022.



A Comparative Assessment of Ecological Conditions for Atlantic Salmon in the Northern MINAS BASIN RIVERS

by Gavin Scott

The Maritime Aboriginal Peoples Council (MAPC) is pleased to introduce its new project, 'A Comparative Assessment of Ecological Conditions for Atlantic Salmon in the Northern Minas Basin Rivers', colloquially titled by its abbreviated name, the 'Salmon Comparative Assessment Project', is a three-year research project (2022-2025) funded through the aquatic stream of the Aboriginal Fund for Species at Risk Act (AFSAR) by Fisheries and Oceans Canada (DFO). The project investigates a number of factors affecting the survival of the endangered inner Bay of Fundy Atlantic salmon: Structures & substrate, the main physical components of salmon habitat; Food availability, the available macroinvertebrates during key periods of the year; Water velocity, the speed of the water that meets salmon preference; and water temperatures, a core aspect of their biological functioning. The boundary of the project focuses on the Debert and Folly Watersheds, but also includes the watersheds of Great Village, Portapique, and Economy.

The main aspect of the study is to compare the ecological conditions of the sites where the Coldbrook Biodiversity Facility (CBF) releases unfed salmon fry (juvenile salmon) and its timing relative to the emergence of eggs that have been incubated in-situ. During the In-Situ Egg Incubation Project, an intriguing question was raised about when the unfed fry were being introduced to the Debert and Folly Rivers. The eggs from CBF are incubated with stream water from Spittle Brook and had reached their 400-degree days much faster than the eggs incubated in the Portapique and Chiganois Rivers, which are geographically adjacent to the Debert and Folly rivers. It was found that water temperature per watershed

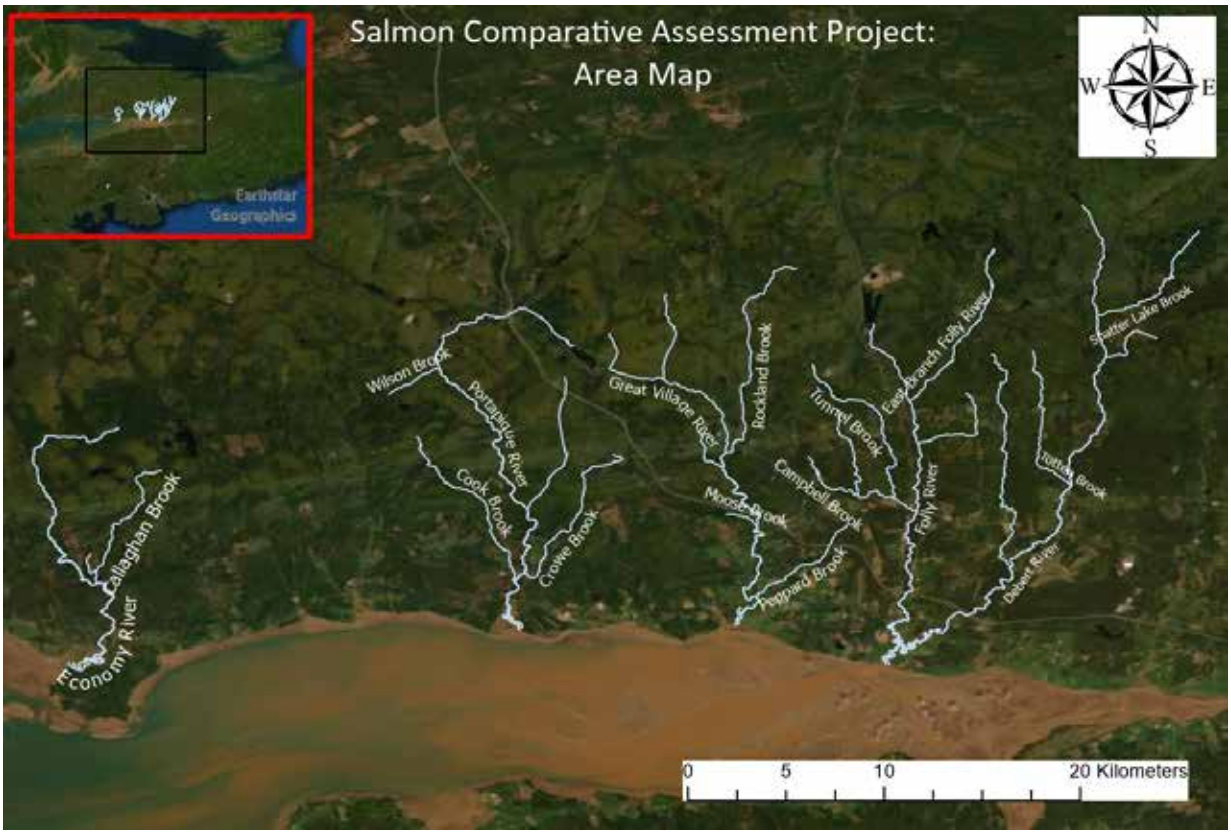


Figure 1. Project Area Map.

Degree Days is the accumulated average water temperature as each day passes, for example: 2 days that average 3 degrees each day, would be a total of 6-degree days.

varied significantly between different regions of Nova Scotia. In one year of the incubation project, the salmon incubated in the Chiganois River had not emerged until almost one month after CBF had released salmon fry in the Debert and Folly watersheds. The difference in timing for those salmon being released in the still wintery waters of the Northern Minas Basin rivers could have an effect on their survival. Their natural emergence is phenologically in sync with the increase of macroinvertebrate abundance and richness, which takes place as winter transitions into spring (Fierro et al., 2021). In addition, the spring spate has been observed to cause faster and deeper moving water, tallied with more intense effluent into the river system, which makes it very hard for the young-of-the-year to find their desirable riffle habitat. Likewise, the winter thaw into spring often brings more turbid water with all sorts of minerals/salts present, and the pH is noted to be lower compared to other seasons in the year. Atlantic salmon are extremely sensitive to acidifying pH, and require clean and clear water in order to thrive, further amplifying how important it is for juveniles to be released after the spate has taken place. By assessing the emergence of alevin (young salmon leaving their redd and

Figure 2. Salmon eggs incubated In-Situ rivers during November, In Situ Egg Incubation Project.

venturing into their new habitat), the team can identify whether the emergence of in-situ hatched salmon corresponds to the timing of the CBF fry release.

In addition to the emergence/release comparison, the project aims to understand survivability of Atlantic salmon fry after they have been released. Within the Debert and Folly watersheds, the project will sample a number of different ecological variables that attribute to the success of wild salmon populations, including routine water quality monitoring, quarterly water chemistry analysis, macroinvertebrate collections, habitat quality surveys, and a combination of assessments for identifying salmon populations. Water quality monitoring focuses on fundamental physical characteristics of the water, including but not limited to: temperature, pH, dissolved oxygen, salinity, conductivity, turbidity, water velocity, etc. Quarterly water chemistry analysis quantifies concentrations of metals, nitrogen, phosphorus, and its general chemical composition. Macroinvertebrate collection takes place in the spring, summer, and fall with intent to measure individuals collected in the sample. The concept is to enumerate the percentage of the macroinvertebrate sample that would be available for a juvenile Atlantic salmon to prey upon. Habitat quality surveys include a scoring model that considers substrate diversity, flow, riffle/run/pool sequences, canopy coverage, riparian vegetation, undercutting banks, etc. Salmon are particularly fussy when selecting spawning habitat, and look for a specific combination of

Figure 3. Salmon fry being released in April/May by CBF and MAPC volunteers.

the parameters listed above. To name a few, they prefer cooler water, neutral pH, moderate water flow, varied substrate and a sheltered site for refuge. Identifying salmon populations and studying their persistence in the watershed is done by conducting eDNA sampling (sampling for salmon DNA in the water) and electrofishing (temporarily stunning fish via an electrical current for capture and release).

Outside of the Debert and Folly watersheds, the field team is exploring promising sites in the Portapique, Great Village, and Economy Watersheds. The work being done on these watersheds is identical to that of the Debert and Folly, with the exception of the assessments for identifying salmon populations. We will collect and present the baseline data for new viable sites to CBF as an option to expand their unfed-fry release program into these watersheds. If the CBF were to expand their release efforts into these rivers, it could benefit the recovery of the species by increasing the recovery efforts throughout the five Critical Habitat rivers that once housed a healthy stock of wild inner Bay of Fundy Atlantic salmon. The MAPC team would follow up with additional salmon population assessments in these new areas to support the persistence research currently ongoing in the Debert Folly Rivers.

WHAT'S NEXT?

The team has shipped out the first batch of eDNA samples (April through August) to the University of Maine, whose technicians will process and analyse each sample for the presence of Atlantic salmon and provide is with the. eDNA is not a suitable tool for providing abundance estimates, but will provide us with the PRESENCE or ABSENCE of our target species, in this case we are only sampling for Atlantic salmon DNA. In November, the team will be incubating Atlantic salmon eggs in the rivers in preparation for comparison with the spring fry release. The project plans to host an in-person outreach event in the second year of the project to present their findings thus far, and engage with a vibrant community

Figure 4. Macroinvertebrate collection and measurement.

Figure 5. YSI Pro DSS © water quality sampler. Parameters from top to bottom include, Temperature (°C), Barometer (mmHg), Dissolved Oxygen % (DO%), Dissolved Oxygen mg/l (DO mg/L), Specific Conductivity (SPC uS/cm), Conductivity (C-uS/cm), Total Dissolved Solids (TDS), Salinity (in parts per thousand) and pH.

Figure 6. In-river DNA collection via OSMOS eDNA sampler backpack.

that is passionate about conservation and the recovery of Atlantic salmon, - a species of cultural importance to the Mi'kmaq people.

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Story Credit: by Gavin Scott, Project Manager, Maritime Aboriginal Peoples Council, 2022

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How does it help whales?

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Enhanced Maritime Situational Awareness (EMSA) PROJECT UPDATE

by *Barry Marsman*

The Enhanced Maritime Situational Awareness (EMSA) Project under the Oceans Protection Plan commenced in May 2019 as a three-year pilot project. The EMSA Initiative has been included as an accommodation measure to provide Indigenous groups with near real-time information on maritime activity in local waters through a user-friendly Web platform.

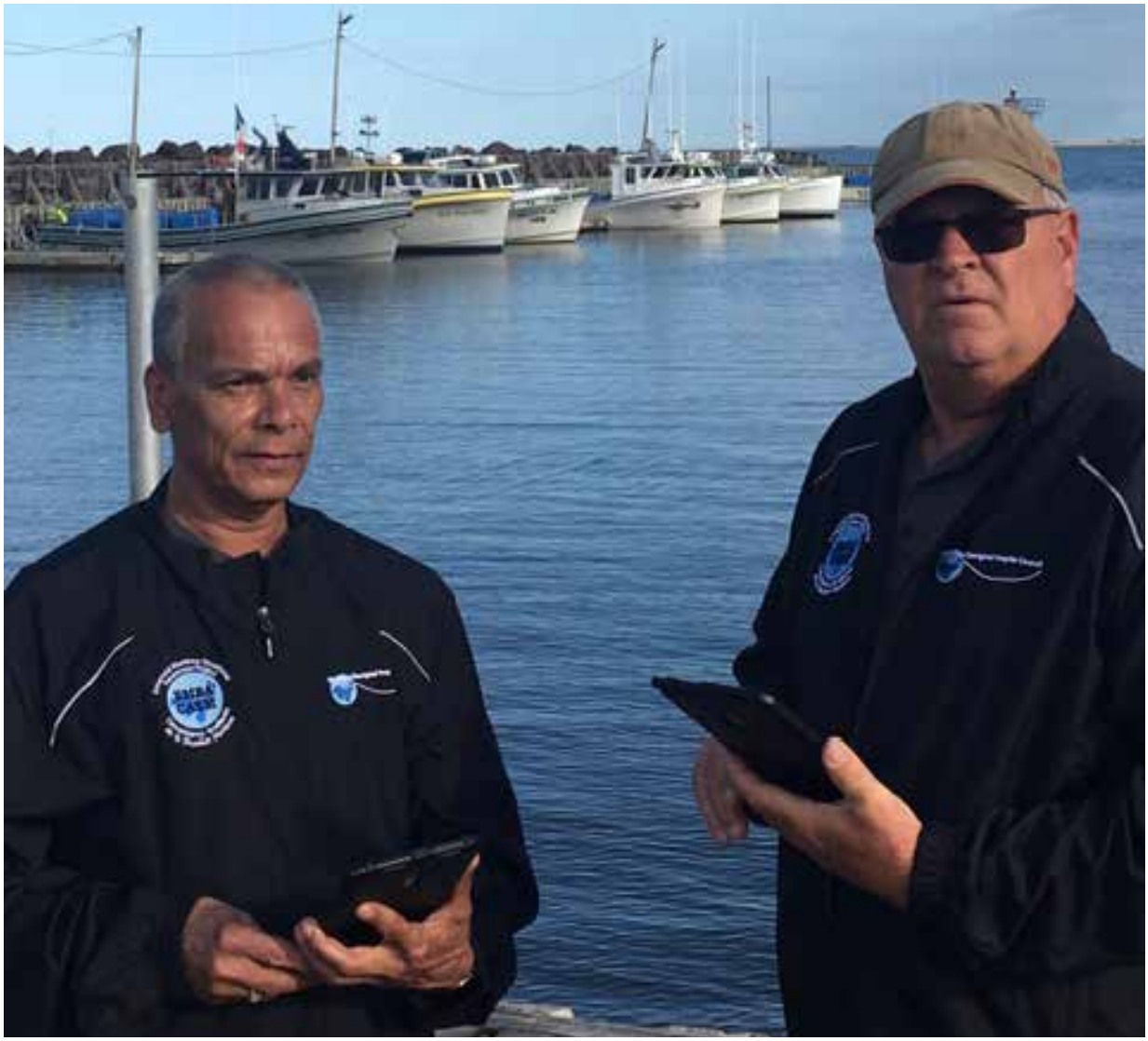
Through Canada's Oceans Protection Plan, the Enhanced Maritime Situational Awareness (EMSA) initiative was co-developed with Indigenous communities and industry to provide near real-time vessel activity and other marine environmental information in local waters through a user-friendly web platform.

Since the launch of the EMSA system in 2019, many Indigenous and coastal communities across Canada have adopted the technology as needed, improving their situational awareness on the water. The Indigenous Pilot host communities and partners have been working in partnership with Transport Canada to develop, test and evaluate the system. EMSA, as one of the core initiatives under the Ocean Protection Plan, has proven to be a part of the healing path forward for some of the Indigenous host communities.

Pilot project host communities:

WEST COAST

- The T'Sou-ke Nation will host a pilot project on the South Coast of Vancouver Island.
- The Pacheedaht Nation will host a pilot project on the South Coast of Vancouver Island.
- The Council of the Haida Nation will host a pilot project on the North Coast of British Columbia.
- The Gitga'at Nation will host a pilot project on the North Coast of British Columbia.
- The Scianew First Nation will host a pilot project on the South Coast of Vancouver Island.



President and Chief Barry LaBillois, NBAPC and Ron Cox working with the EMSA Platform. Photo by Barry Marsman.

- The Malahat First Nation will host a pilot project on the South Coast of Vancouver Island.
- Tseycum First Nation will host a pilot project on the South Coast of Vancouver Island.

CENTRAL

- The Mohawk Council of Kahnawà:ke will host a pilot project along the south shore of the Saint Lawrence.
- The Essipit Innu First Nation Council will host a pilot project along the north shore on the Saint Lawrence River estuary.

ARCTIC

- The Tuktoyaktuk Hunters and Trappers Committee will host a pilot project in the Inuvialuit Settlement Region.
- The Ekaluktutiak Hunters and Trappers Organization will host a pilot project in Nunavut.
- The Nunatsiavut Government will host a pilot

project in Nain, located in the Nunatsiavut settlement area on the northeast coast of Labrador.

EAST COAST

- The Maritime Aboriginal Peoples Council will host a pilot project in the coastal waters surrounding Nova Scotia, Prince Edward Island and New Brunswick.

OTHER DATA CONTRIBUTORS

- Windsor Port Authority – Windsor, Ontario
- Ocean Wise Conservation Association – Vancouver, British Columbia
- Coastal and Ocean Resources Inc. – Victoria, British Columbia

PARTNER ORGANIZATIONS

Transport Canada is working closely on this initiative with the Canadian Coast Guard and other federal partners. This include Fisheries and Oceans Canada, Environment and Climate Change Canada and the Canadian Space Agency.

The Maritime Aboriginal Peoples Council (MAPC) and the Aboriginal Communal Commercial Fishing Entities (ACCFEs) of our partner Native Councils (Native Council of Nova Scotia, Native Council of Prince Edward Island, and the New Brunswick Aboriginal Peoples Council) have played a significant role historically and contemporarily in the development, enhancement, and direction of the EMSA initiative. In the first year, fishing vessels from each of the ACCFEs were selected to participate in the EMSA initiative after being subject to a vessel suitability assessment. Selected vessels were equipped with Class-A AIS (automatic identification system), TIMEZERO bathymetry reading software, new marine grade computers, and new DSC (digital selective calling) radios, and marine grade tablets. AIS and TIMEZERO software training is ongoing, with more training opportunities scheduled to ensure operational proficiency by those involved in the management of the fishing fleets.

Since safety is one of the core pillars of the EMSA initiative, safety advocacy is critically important and will remain so. MAPC's steadfast advocacy to ensuring that the EMSA safety pillars remain strong has been unwavering and has not gone unnoticed by our partners at Transport Canada and beyond.

Through the continued delivery of education, training, and collaborative awareness engagement sessions with Transport Canada, DFO, and the Transportation Safety Board, meaningful and important relationships are being developed and nurtured in the spirit of collaboration.

Participation and access to the evolving key functionalities of the EMSA platform will only further support the ACCFEs efforts to achieve their safety goals, objectives, and desired outcomes; namely, protecting its most important assets: our people, property, equipment, and environment.

The following development features allow the ACCFEs to further enhance their oversight capabilities which includes organizational sub-fleet functions that allow pinpoint targeting of vessel positioning in near real-time while on the water. These features are supported by breadcrumb data to monitor trip routes and heat map data to identify areas of concentrated harvesting activities.

The EMSA system allows for easy to use report generation capabilities to capture near real time data in relation to port exit and entries, time spent at sea, total kilometres travelled, and the number of trips from a specific port. These reports can be automatically generated daily, weekly, and on a monthly basis specific to LFA seasonality.

Through the next phase of the Oceans Protection Plan, EMSA will continue to grow the number of Indigenous community partnerships and be integrated into other Oceans Protection Plan initiatives. The system itself will also be enhanced to further improve marine safety, environmental monitoring, and protection.

Story Credit: by Barry Marsman, Project Manager, Maritime Aboriginal Peoples Council, 2022.

EMSA Platform training. Photo by Barry Marsman.

PROTECTING

WHALES AND SAFER GEAR TRIALS ON EPEKWITK

by BRYAN MARTIN

Since at least 2017, there have been articles in Mawqatmuti'kw written about the North Atlantic right whale (NARW). The last one was in the winter-spring 2020 edition (p.120), written by Vanessa Mitchell, specifically on the basis for gear markings. Since 2020, the situation regarding these whales in particular has not improved. Those gear markings that Ms. Mitchell wrote about were sadly never intended to reduce the number of entanglements, yet simply to assist with international relations in order to point the fingers at the correct country or industry where the entanglement(s) took place rather than pointing the blame at the country where the whale washed up dead. This 'finger pointing' would therefore assist in targeting specific areas and/or fisheries for better conservation measures. Sadly, the population numbers continue to slide with the latest estimates coming from the North Atlantic Right Whale Consortium putting the entire population at 340 individuals, down from 520 in 2015, with ship strikes and entanglement occurring all too often. What is worse is that of the 340 remaining NARW, there are only 72 reproductive females. There have been five new entanglements this year including a fresh one on the infamous Snow Cone (whale # 3560), one of those known breeding females born way back in 2005. She was spotted in September 2022 with her fifth entanglement and rapidly declining health. Experts agree that her death is now inevitable, and with that, the almost certainty of her calf's death as it had not passed the weaning age when they were spotted together for the last time.

Although some are truly interested in protecting whales from entanglements and the associated pain and suffering, the largest pressure to protect them is not coming directly out of the goodness of our hearts, but rather as a reaction to the biggest buyer of our lucrative crab and lobster; the United States of America. Both of these types of seafood are caught using either pots or traps which,

Edgetech on-demand gear. Photo by Vanessa Mitchell.

due to the vertical line in the water, can directly contribute to whale entanglements. As we know, entanglements can be lethal - often resulting in long drawn out deaths as the health of the whale declines because it cannot feed properly. The US Marine Mammal Protection Act specifies that fish and fish products cannot be imported into the country if the fishery for that seafood is harming marine mammals beyond what scientist have determined "is the maximum number of animals that can be removed from a group which will allow that group, or stock, to reach or maintain its sustainable population". Scientists call it a 'Potential Biological Removal' (PBR), which in itself does not include natural mortalities. With less then 350 North Atlantic Right Whales remaining, they have an estimated PBR of 0.7 as of the last assessment in 2019, meaning that less than 1 whale can be lost per year if there is to be hope for the population to be sustained (even less if we aim for recovery of the population). We have likely already overshot that number for 2022 based on the presumed number of deaths this year. Legally, it is quite complicated, but ultimately it means that Canada must implement measures to mitigate the "incidental mortality and serious injury" to all marine mammals that are comparable in effectiveness to similar fisheries in the US. Many discussions have been had between Fisheries and Oceans Canada (DFO) and the fishing industry to identify potential measures that could meet both the needs of the industry and the import provision

requirements; to date, the testing, although limited, has not identified any clear broadband mechanism. To further complicate the situation, any whales that have died for unknown reasons or through ship strikes have a direct impact on defining the PBR value, but are not penalties against the country of origin - only those that are related to fishing activity influence a country's mortality rate for the US MMPA. Due to its low population status, the endangered North Atlantic Right Whale is drawing the most of our attention; however, Atlantic Canada is home to many other large whales who are also prone to entanglement, from the largest animal to ever live, the blue whale, to our smallest rorqual, the minke whale. For a direct comparison, the humpback whale, which is listed as threatened, has a PBR of 22, meaning the population will remain stable if less than 22 are killed per year. A more recent blow to the industry, Seafood Choice, a seafood watchdog organisation that lists seafood as either 'sustainable' or 'to avoid', has just red listed the entire trap and pot fishery due to the impacts that the fishery is having on whales in the North Atlantic. Although this 'red list' does not physically affect our fishery, there are many people who may choose to shift their seafood purchases elsewhere, meaning that this could be disastrous to the Atlantic Canadian economy. It gets worse.

In an attempt to avoid further entanglements, the Canadian Government now implements sweeping closures to the fishing grounds when right whales are detected in the region. A 2000 square km area is closed temporarily for 15 days and all fishing gear must be removed within 48 hours of the closure announcement. If another whale is observed during the next 9 days, the area is closed for the remainder of the season. As we approach the end of October, these closures encompass a huge percentage of the southern Gulf of St. Lawrence beyond the 20-fathom line (it is currently assumed that NARWs rarely enter waters that are shallower than 20 fathoms (120 ft or 36.5 m)) and parts of the Bay of Fundy (Figure 1); however, there is evidence of right whales being observed from the shore from the US. For our friends in the Gaspe Peninsula, 20 fathoms is very close to shore. Although we generally focus on the lucrative crab and lobster fisheries, these closures also apply to untended gillnets and groundfish longlines. In these closed areas, fishers are not permitted to fish with ropes and buoys that extend from the bottom (where the traps are) to the surface (where fishers hook onto the trap to haul them). These buoys are known as floating endlines and not only serve to hook onto the pots or traps, they also serve to see where they are located. Here is the good news.

Enter the age of the "ropeless gear". These gear types are not truly ropeless and the language is slowly adopting the terms 'pop-up' or 'on demand' to better describe the type of equipment, but the end result is the same. Although on-demand gear does have a rope, there is no rope in the water column stretching between the trap, which is sitting on the bottom, and the surface of the water. This is the portion of the gear that has the highest potential for entangling a whale. A few years ago, some beautiful minds from within and outside of the fishing industry came up with the idea of having the endline rope and buoys coiled in a bag or basket on the bottom of the seabed that could be triggered to release the buoy to the water's surface using an acoustic remote control. This would allow the float (or buoy) and line to rise to the surface only when the fisher 'demanded' it to do so, and remain carefully stowed out of harms way when not needed.

The absence of a floating rope nearly completely eliminates the potential of whales getting entangled and thus can be a reliable method to legally fish in closed areas. This is simply because fishing is not the problem, the vertical lines are. Twenty or thirty years ago, this would have been next to impossible. Back then buoys were essential in order for the fishers to find their traps. In the modern era, fishers generally mark their traps to within a few metres with an onboard GPS and a screen that shows exactly where you left them in reference to the boat, at least well

SMELTS. Photo by Vanessa Mitchell.

within the working radius of the acoustic systems. With the help of a smartphone app or tablet, fishers can pinpoint their buoys and release them one at a time when they are within the working vicinity. Each piece of gear has a specific code, meaning that only the fisher that set them can retrieve them. This does however lead to one concern from industry: how to avoid setting lines of traps over your neighbours' lines if you can not see where their buoys are, especially when setting long strings of traps, known as trawls? There are some interesting ways to avoid this that are either specific to the digital platform or the region, but a catch-all solution between all the players has not made it beyond the developmental phase.

The Canadian Wildlife Federation (CWF) has been following the plight of the North Atlantic right whale for quite some time and, due to many staff having some previous experience within the fishing industry, they have respectfully been able to act as an unofficial intermediary between the federal DFO and industry/fishers. With funding from the DFO's Whalesafe Gear Adoption Fund, CWF have established the CanFish gear lending program. This program not only allows fishers to fish within closed areas with the on-demand gear, it also provides funding to fishers to trial the equipment with trained staff before they may choose to purchase it themselves. Fishers get an opportunity to try out six different types of equipment on their own boats in their home waters, all the while having the opportunity to provide meaningful feedback.

Through many conversations and meetings over the years, it took a chance meeting at a movie theatre to get the ball rolling. After a few short days it was agreed that the Native Council of Prince Edward Island would trial this new equipment on one of their fleet vessels. Although the CanFish program does work with weak link, weak rope, and other whale safe gear modifications, the team focused solely on the on-demand gear modifications as these are the only ones that are currently permitted in closed areas. We set out of Northport, PEI, on August 30th, 2022 aboard the Prosper Sisters, with our own Tony Clements at the helm, two experts from CWF, and two MAPC staff along for the learning experience. We set out bright and early to the deepest waters that would normally be fished along these shores with gear types from five companies, including; Edgetech, two

types of SMELTS (one with Teledyne acoustics and one using Edgetech acoustics), Ropeless Riser Systems by DVB Technology, Ashored Innovations, and Desert Star Systems. One additional type, the FioBuoy by FioMarine, is generally available for trial but was not available at the time. All of these systems were trialed with trawls of five or six standard lobster traps.

All in all, the day went off without a hitch. Some systems were easy to use and quick to setup, while others were the polar opposite. In the end, there was one clear front runner for this boat in this area: the Edgetech system. It was the simplest to use with the most user-friendly software system for trap retrieval. It was fast to deploy and re-set, and best of all it didn't require any extra equipment other than the buoy system and the acoustic remote. The software app from Edgetech uses a Navionics systems that many in the industry are already familiar with. The equipment itself is housed in a very simple, wire mesh, weighted lobster type trap with the endline rope neatly coiled inside. The buoys that will float to the surface are attached to the lid that neatly contain the rope. The housing can be custom built to accommodate varying lengths of rope or larger/smaller diameter rope (i.e., bigger or smaller 'trap'). Anyone who already builds their own wire traps can even build the housings themselves to save a few bucks. Once built, the system works by coiling the buoy line in the cage and placing the lid with attached buoys on the trap to secure the rope. The lid is secured by screwing on a hockey puck sized plastic screw to the release mechanism. The entire set up, once onboard takes approximately one minute to ready for redeployment. The housing is attached to the main trawl line as any regular trap. Once deployed, the system sits on the ocean bottom as a regular trap would. For retrieval, you open the app and, with the transducer in the water, click on the appropriate buoy, and within 30 seconds the lid with buoys will appear at the surface. The lid/buoys can then be brought in through the hauler as a normal buoy with the first trap/system acting identically to a regular lobster trap, albeit with no lobster in it. The release mechanism is battery operated using standard 9V batteries that should last one year and up to 100 deployments (14 weeks at 7 deployments per week). The app itself also has a range responder to help find traps (if moved by currents). During our trials, there were no issues with this system over the three days. Unfortunately, the same cannot be said of some of the others that were trialed. Ashored Innovations, which uses a similar design, failed to function each time, something that we were assured was not uncommon (during trials a regular buoy is attached to the opposite end of the trawl in the event of such an issue).

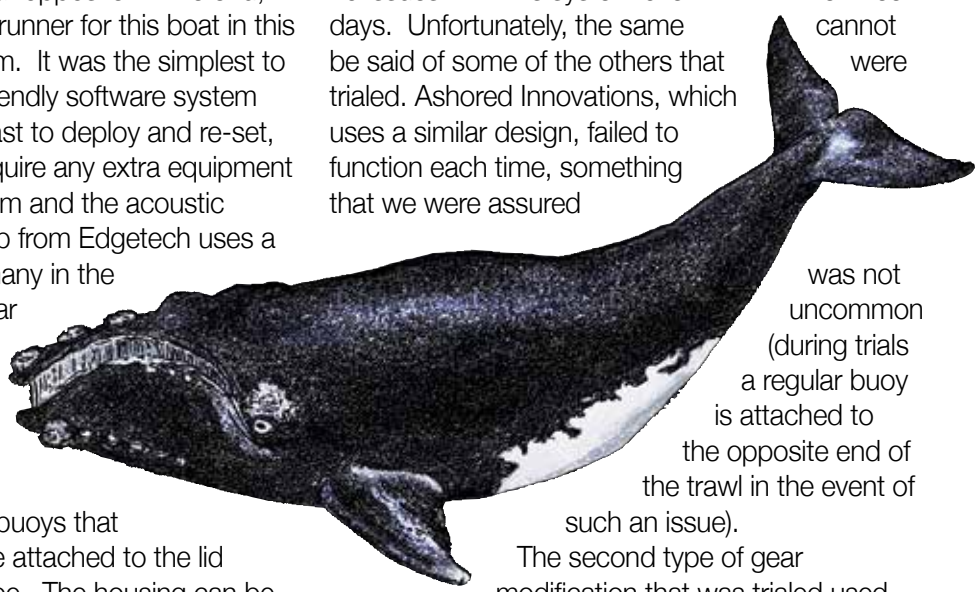


Illustration by Anna Nibby-Woodsa

The second type of gear modification that was trialed used compressed air from a SCUBA tank and a lift bag system. The SMELTS system, when on the bottom, simply looked like a wire mesh trap with two SCUBA tanks on the inside and a brightly coloured PVC bag on the outside. During retrieval, the compressed air would fill the bag and 'lift' it to the surface where the bag and cage would act just the same as a buoy, albeit a lot heavier. The hi-visibility bag did as it should and was very visible at the surface, which was one of its best features. The compressed air within the cage lasted for at least six deployments in the depth of water we were utilizing it (60-100 ft) but would need to be re-charged periodically using an on-board compressor or compressed air tanks. The downside to this system was that it required regular, on vessel maintenance in the

form of refilling tanks and was by far the heaviest option presented. The SMELTS system however did have two retrieval software available, one of which was the same as Edgetech making it just as simple to use. The Ropeless Riser system was similar to the SMELTS, but rather than stand alone, it attached directly to one of the traps, turning the first trap of your trawl into a buoy, lobster and all. Although promising, this system malfunctioned after a day and the mini-tanks needed to be switched or refilled after each retrieval.

The last system that was trialed was produced by Desert Star, and although it was the cheapest option, it was the least favoured. The difficulties arose primarily because this system required the replacement of a small wire that, upon activation, is burned through in order for the buoy to be released. It quickly became evident that this system would be challenging to use in cold temperatures and heavy weather, simply due to the need of replacing the small wire.

Following our trials, our captain had an interesting and very important comment, which was independent of the type of gear used. Generally speaking, the captains try to approach their trawl of traps from the downwind side in order to avoid drifting over the traps while retrieving, however, with only one pop up system per trawl, this would not always be possible. Although a second system could be used on the opposite end, it would double the price.

At the moment, these systems are not cheap costing between $2,000 and $14,000 per unit, with Edgetech coming in near the middle and SMELTS at the most expensive. This is in addition to the acoustic remote that each vessel would need. Assuming trawls (or groups) of six traps per deployment, it would require 50 on-demand systems on a 300-trap licence, 30 units if you 'trawled up' to 10 traps per line. This would amount to over $150,000 if all traps were fished.

As noted, these systems are not intended to be used all the time, with some fishing areas perhaps never requiring to use them if whales are not present. Currently, these systems are only required when there is a closure due to the presence of North Atlantic right whales and the fishers want to continue fishing in the area. Although expensive, this one-time cost allows the fishers to operate in closed areas which would otherwise result in a lost season. As industry is quick to point out, these closures are becoming bigger and are lasting longer than anyone would have imagined even a few years ago. The hope is that once there is a standardized system in place and a higher demand on the product, the price of the individual pieces will come down.

Some may wonder whether it is really worth the effort simply to save a couple of individuals, questioning the value of a whale. Although some have suggested that putting an economic value on an endangered species risks 'instrumentalizing' an animal, the International Monetary Fund estimated the value of a single large whale to be worth over 2 million dollars. This number was calculated due to their abilities in carbon sequestration, ocean fertilization, and tourism, things we desperately need, simply by being alive and doing what whales do. Sadly, and regardless of the cost, these technologies will not save all the whales from entanglement as there are still lost or abandoned gear in the closure areas, but that is a story for another day.

Although some of these alternate gear types did work well off the coastal waters of Epekwitk, they might not work in all areas or in all types of fisheries, but we will not know for sure unless we try them. For some, adopting these technologies will be about the whales, while for others it will be about the ability to continue doing what they love – the ability to fish.

Story Credit: by Bryan Martin, Oceans Advisor, Maritime Aboriginal Peoples Council, 2022.

HISTORY OF HADD AND THE FISHERIES ACT

by Stefan Miller & Christina Davis

ORIGIN

The Fisheries Act [s. 35(1)] prohibits activities that result in a harmful alteration, disruption, or destruction (HADD) of fish habitat. The HADD provisions were written into law in 1977 with the Federal Government legislatively acknowledging its exclusive constitutional authority over inland, and coastal fisheries ([s. 91(12)] of the Constitution of Canada) and acknowledging that habitat is critical to any fishery. Without the Fisheries Act [s. 35(1)], there is no federal law that is specific in its purpose to protect fish habitat.

Harm Towards HADD

In 2012, the HADD provisions were removed from the Fisheries Act. This left some fish species without protection and muddied the waters for many other species of fish that were not a part of well-established fisheries.

The HADD provision changed to a prohibition against works, undertakings, or activities that result in "serious harm" to fish that are part of a commercial, recreational or Aboriginal fishery or fish that support such a fishery. The definition of "serious harm to fish" was "the death of fish or any permanent alteration to, or destruction of, fish habitat." The definition of "serious harm" allowed for more severe harm toward fish habitat than was previously permitted under the HADD. While a requirement to demonstrate when habitat was permanently altered or destroyed was necessary, a proponent may have been able to argue that the habitat alteration or destruction was not permanent if there was a possibility – however remote – of future restoration. Put simply, the Fisheries Act protected commercially important fish, but all other fish were not protected under the same standard, if at all, and the water

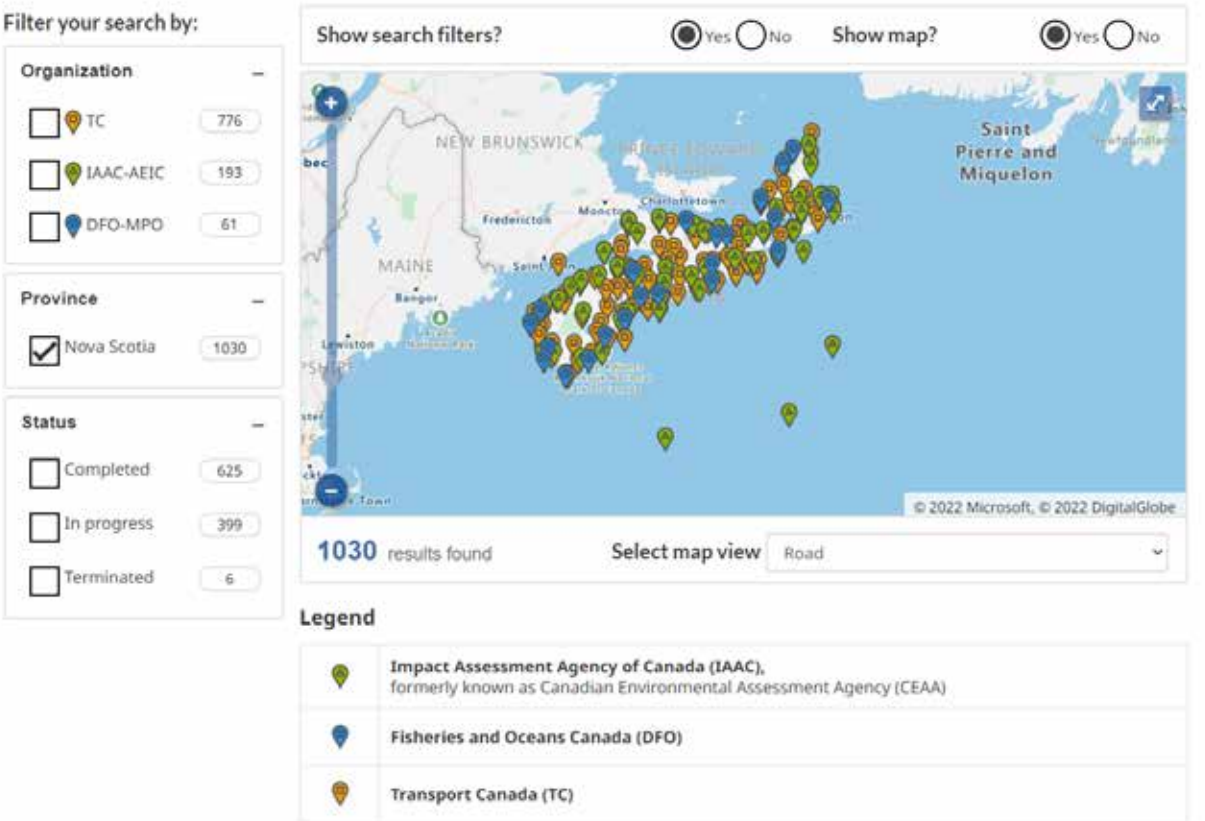


Figure 1 Fisheries Act Registry Map (DFO, 2021).

and contributing habitat of any fish had little to no protection. Having removed the HADD provision significantly narrowed the scope and nature of activities covered by the prohibition against the death of fish. Additionally, this change limited the ability of the Fisheries Act to respond to new information about the cumulative effects of projects, including the incorporation of Traditional Knowledge.

The Return of HADD and a Modernized Fisheries Act

In 2018, several amendments were passed to the Fisheries Act, including restoring the HADD provisions. Other amendments strengthened the protection of all fish and fish habitats, along with the HADD provision. The definition of fish habitat was amended to mean "water frequented by fish and any other areas on which fish depend directly or indirectly to carry out their life processes, including spawning grounds and nurseries, rearing, food supply, and migration areas" meaning all species are protected regardless of their commercial or cultural value. The amendments to the Act created the opportunity to develop a framework that modernizes: the management of fisheries, the conservation of fish and fish habitat, the reduction and identification of environmentally harmful activities, and the protection of all aquatic species in Canada. Following MAPC-MAARS's participation in the discussions on the legislative changes to the Fisheries Act over the past few years, we are now participating in reviewing the suite of regulatory amendments and policies proposed by the Fisheries and Oceans Canada (DFO) through the Fish and Fish Habitat Protection

Program (FFHPP) engagement platform.

MAPC has provided comments to DFO raising concern about the homo-centric worldview of offsetting and banking - one element of the FFHPP engagement. Restoring habitat in one area while destroying another area is incompatible with an Indigenous eco-centric worldview of living in harmony within an interconnected and interdependent natural world that includes humans. The ability to replicate an ecosystem's function is limited, and many offsetting projects have failed by resulting in overall productivity loss. We recommended improving both compensation science and institutional approaches to achieve successful offsetting projects. The homo-centric approach also contradicts the global biodiversity vision of living in harmony with the natural world, thus discounting the value of biodiversity, including intrinsic values. At a minimum, if a project absolutely cannot avoid or mitigate a HADD, then the project must be of vital benefit to Canadians for it to be approved.

Public Registry

One of the tools DFO has committed to providing to the public is the Fisheries Act Public registry. The Public Registry aims to improve transparency, monitoring, enforcement, and tracking cumulative impacts of projects associated with Fisheries and Oceans Canada, Transport Canada, and the Impact Agency of Canada.

As it stands, each project in the Registry is meant to include: ministerial orders and agreements, standards and codes of practice, Fisheries Act authorizations, permits for designated projects, and fish habitat restoration plans to keep the public informed. MAPC found that the registry was not particularly user-friendly or as transparent as we'd expected. As such, we suggested that a customizable project notification system would improve public engagement with project authorizations and automate DFO's sharing of information with the public.

Offsetting and Banking

As a last resort, DFO may determine that a proposed project cannot avoid or mitigate a HADD and may require the proponent to 'offset' its impacts by creating or restoring habitat elsewhere. Habitat offsetting can take the shape of preservation, enhancement, restoration, or creation of a wetland, stream, or "habitat conservation area" that compensates for expected adverse impacts to similar nearby ecosystems. The goal is to replace the exact function and value of specific habitats adversely affected by a proposed activity or project. Typically, a contracted company specializing in restoration and funded by the proponent carries out offsetting projects in similar habitat to the one affected by the HADD. DFO also allows for some projects to create or restore habitat elsewhere ahead of time in anticipation of a project that will create a HADD - known as 'habitat banking'. In these cases, DFO then issues a habitat credit that the proponent can use to offset their HADD later. Fish habitat banking has the potential to provide project proponents with a framework to develop responsibly and mitigate their impacts proactively. Banking is useful to proponents with multiple projects planned because they can 'bank' habitat credits and streamline the HADD authorization process. There is a downfall to habitat banking and much of it comes down to how "value" is perceived in ecological functions. At the end of the day, we still want proponents to take active measures to avoid harmful impacts to habitat and not simply determine that they can "afford" to destroy habitat because they have credits.

Cumulative Effects

Figure 2 Restored habitat cannot always achieve the function of natural habitat. (source: https://ensia.com/voices/novel-ecosystems-are-a-trojan-horse-for-conservation/)

Multiple stressors on habitats such as pollution, nutrient inputs, invasive species, and habitat alteration can lead to cumulative effects. The concept of cumulative effects builds on the reality that a single-incremental action may have minimal effects, but when combined with other interacting stressors in close proximity, there is an accumulation of effects that may result in the HADD of fish or fish habitat. Prior to a HADD authorization, the responsibility of considering cumulative effects of any project lies with the Minister of Fisheries and Oceans. Though not expressly defined in the HADD provisions, the interacting stressors on ecosystems and social-ecological systems through time ought to be considered when DFO works toward constructing their position statement on cumulative effects. Understanding cumulative effects can holistically represent the past, present, and future value of a particular habitat to its inhabitants, ecosystem services, and surrounding community.

MAPC advances the reality that cumulative effects cannot be understood by just adding up the individual impacts of several projects. The only way to effectively articulate the cumulative effects for a given area is to monitor the area for change over time. For example, instead of monitoring effluent from pipes, a more comprehensive method would be to monitor the total chemical load in a collection of species or the environment to understand the effects of the introduced effluent. Acquiring such an extensive understanding of the environment requires a strong commitment and resources to support and maintain many environmental monitoring projects. One of the greatest barriers to understanding the potential cumulative effects of a given project comes from the lack of pre-project monitoring to understand the baseline conditions of a given area. The phrase ‘time is money’ is a stark reality in the world of development and, most times, the timing of project planning and the regulatory framework does not provide for sufficient pre-project monitoring to occur which leads to little more than a snapshot of the habitat conditions. This is just one reason that public engagement, in particular with

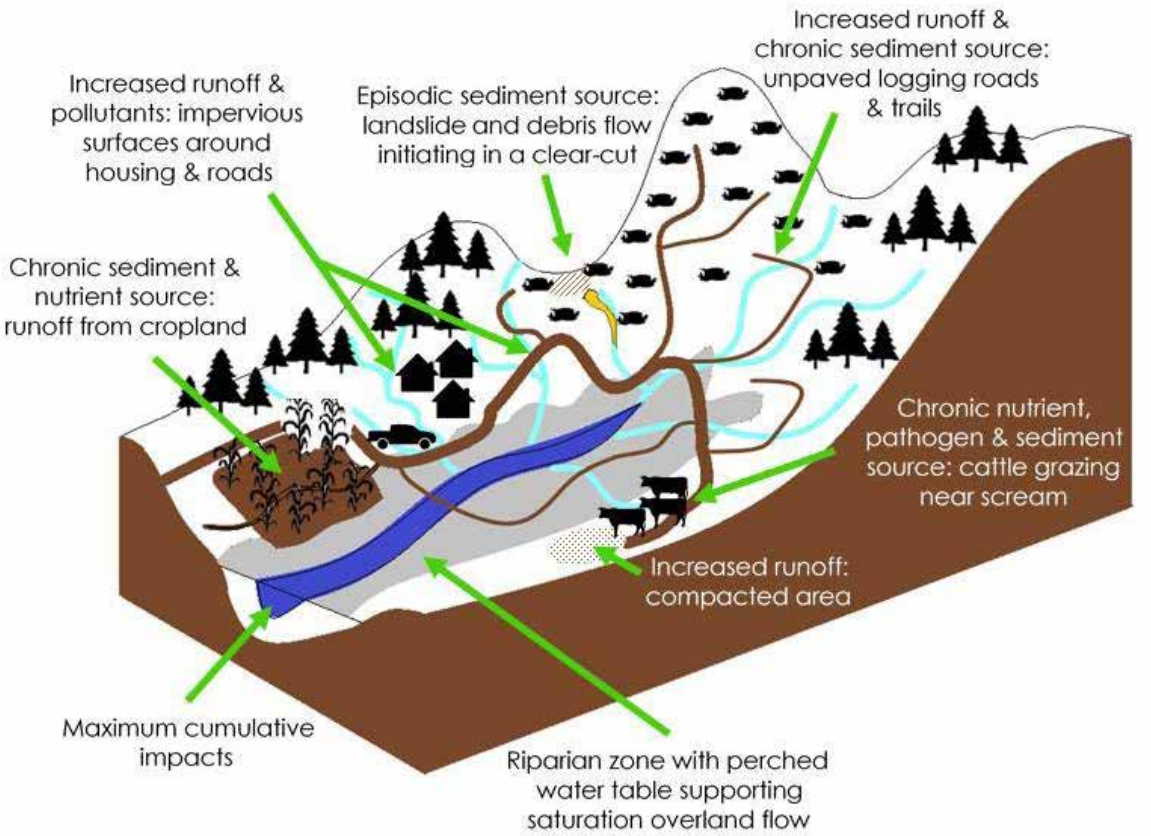


Figure 3 An example of how land uses within a catchment can generate cumulative effects (DFO FFHPP, 2021)

the Indigenous and local community, is so important to understanding true impacts.

Prescribed Works and Waters Regulations

DFO is also proposing Prescribed Works and Waters Regulations which they suggest would provide a better approach for managing routine low-risk projects. The proposed Prescribed Works and Waters Regulations would provide a list of pre-approved conditional activities that have demonstrated a low-risk of compromising the conservation and protection of fish habitat. Projects that meet the requirements would be subject to a less intensive regulatory process to proceed, theoretically leaving more time and resources for evaluating and providing advice for the larger, more high-risk projects. MAPC raised concerns over the lack of detail assigned to the Prescribed Works and Waters Regulations and that the simplification of proposed future activities may become detrimental - especially where there may be habitat or land of special significance. It is in the details of a project where the potential harms are identified and we have concerns that the details may be missed where it matters the most if the streamlined process does not have place to account for habitat uniqueness.

Standards and Codes of Practice

Six interim Standards and Codes of Practice have been developed that outline best practices for avoiding harmful impacts to fish and fish habitat for: beaver dam removal, culvert maintenance, end-of-pipe fish protection screens for small water intakes in freshwater, routine maintenance dredging, temporary cofferdams, and diversion channels,

and temporary stream crossings. Similar to the prescribed works and waters regulations, the codes of practice aim to incentivize proponents of projects, works, and activities to follow a list of nationally consistent best practices for a particular project type that, if followed, would streamline the approval for that project.

While the changes to the Fisheries Act offer modernized protections for fish of all species and their respective habitats, we can't forget that Canada has adopted the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). Part of the adoption of UNDRIP includes acknowledging the right of Indigenous peoples to Free, Prior, and Informed Consent, which is meant to protect the rights of the Indigenous Peoples in Canada. Free, Prior, and Informed Consent allows Indigenous groups to allow or withhold consent for projects that may impact their traditional territories. The Fisheries Act also calls for the Minister to consider any Indigenous Traditional Knowledge available. For example, the integration of Traditional Knowledge requires a strengthened role for Indigenous peoples to review projects, conduct independent monitoring, and engage as equals at the policy development table. These factors therefore must be considered as the Fisheries Act continues to undergo revision, and continue to be incorporated in future amendments to the Act.

Conclusions

All in all, the return of HADD provisions to the Fisheries Act returns the legal precedent to uphold harms to habitat - a factor that did not exist with the 2012 change to “serious harm”. While we have shown that there are many benefits to moving forward with above elements, there are still some details that need to be ironed out and refined to ensure that habitat is being effectively protected. There are new engagement opportunities coming down and MAPC will continue to be involved along the way to engage with our partners and provide recommendations to DFO based on the feedback we receive.

Story Credit: by Stefan Miller and Christina Davis, Fish and Fish Habitat Coordinator, Maritime Aboriginal Peoples Council, 2022.

Indigenous-led Investigations & eDNA Convictions- AIS IN NS

by Jesse MacDonald

We've all heard about invasive species before, but what exactly are they? The simplest definition is that it's an organism that is "alien," or not native to a particular habitat. These organisms are frequently introduced through a variety of human activities: a seed being wedged in the treads of a hiker's boot, a bug catching a ride between forests on the undercarriage of a car, or a fish being carried in a bucket by an angler looking to bolster the activity at their favorite fishing hole.

Your next question might be, "Why are these alien species so dangerous?" Well, being an invasive species comes with a variety of potential perks. Their new habitat may lack any natural predators, and if they are successful and able to reproduce, their numbers may multiply and go unchecked. For the native species of this unfortunate habitat, this means there is a new overwhelming competition for resources such as food and shelter. Sometimes the invasive species may be predatorial and hunt the native species to exhaustion. Without any natural predators in their new habitat, invasive species will eventually exhaust the resources that allowed them to be so successful in the first place. The ecosystem, not being able to withstand this abuse, could grow inhospitable to all of its residents.

For any person relying on this habitat for a particular resource or function, this change could spell hardship as the traditional means of harvesting are wiped out. Residents and the eco-tourism industry of Nova Scotia for example, rely heavily on the native Atlantic salmon population for many different reasons. The Indigenous community rely on the salmon for food, social, and ceremonial purposes, while, at the same time, there is a million-dollar tourism industry targeting the angler and sport-fishing communities. When it was discovered that smallmouth bass had been introduced to habitat

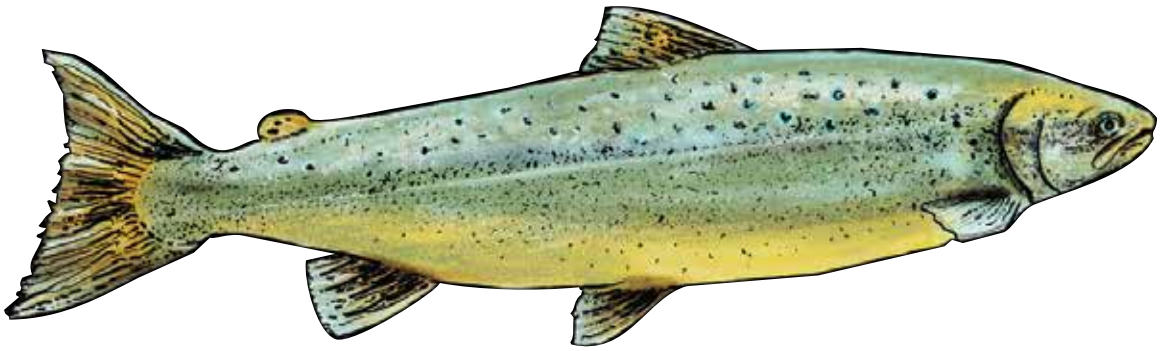


Illustration of Atlantic Salmon by Anna Nibby-Woods.

known to contain Atlantic salmon, a decision was made to intervene to attempt to halt further invasion.

For there to be any kind of intervention, it is important to identify where these alien species have invaded. This is what MAPC's project, the Indigenous-led Investigation & eDNA Convictions – AIS in Nova Scotia set out to do. I know, it's a long title, but bear with me. The intention of the project was to first introduce the off-reserve Indigenous community in Nova Scotia to the aquatic invasive species (AIS) that are known to occur in Nova Scotia or in adjacent New Brunswick. We then sought to have community members provide us with a handful of waterbodies that they believe contain AIS along with images and coordinates. Having firsthand experience continuing to practice their harvesting rights, the off-reserve community holds up-to-date knowledge of fish populations in local waterbodies. Using this knowledge, and other public sources, a number of waterbodies suspected to harbour invasive smallmouth bass, chain pickerel, and/or goldfish were chosen to be tested. Why these species? One, the lab does not have the DNA sequencing for every species, but did for these species, and two, these species were wither known to occur or thought to occur most frequently in Nova Scotia watersheds through our research.

You might be wondering, "How do you test for a specific organism?" Fish move really fast, after all, and our water here in Nova Scotia is not always clear. This is where we use a technique called Environmental-DNA (eDNA). This sci-fi-sounding process relies on the fact that species are constantly shedding their DNA. You are shedding skin cells as you read this, fish lose

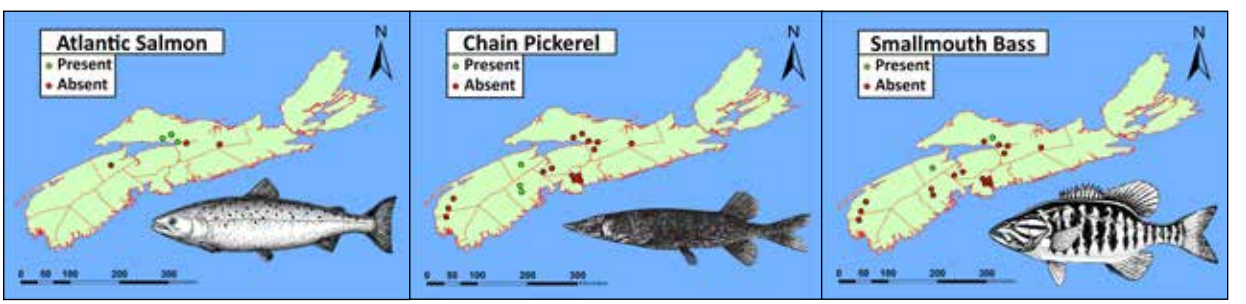
Depiction of a Chain Pickerel. Notable characteristics include a dark vertical bar extending from the eye to the bottom of the cheek. (Size Range: 36-76cm)

Depiction of a Smallmouth Bass. Notable characteristics include an upper jaw that does not extend beyond the back of the eye. (Size Range: 25-69cm)

their scales as they swim, plants shed their leaves and other compostable parts of themselves. When DNA is lost in water, it's kept there in suspension, ready for the taking! By filtering this water through a special piece of paper that has incredibly fine pores, we can catch the DNA in the pores while letting the water pass through.

The complicated part is detecting the DNA of the organism we're looking for. The sample, captured on that special piece of paper, is delivered to a lab with equipment that can detect the DNA. This is done through a process known as Quantitative Polymerase Chain Reaction (qPCR), through which we can create billions of copies of the DNA captured in the sample (the DNA of the organism we're looking for, specifically). With a large enough quantity of DNA, we can detect it using a fluorescent signal, and if that signal is strong enough, we say the sample tested positive for the organism.

Using this method, MAPC was able to successfully take samples from a total of 18 waterbodies in Nova Scotia. Of these waterbodies, three tested positive for Chain Pickerel, two tested positive for Smallmouth Bass, and none tested positive for Goldfish, all of which are invasive species. Of these 18 sites, six were tested for Atlantic Salmon, three of which tested positive (check the maps for our sample locations). Armed with this information, MAPC has the ability to make confident recommendations and plan future projects that focus on the targeted removal of these invasive species that could negatively impact the Atlantic Salmon population. It is MAPC's hope that there be a continuation of this project in the future that focuses on areas missed in Nova Scotia and extend into to our neighboring provinces as well.



MAPC staff member collecting an eDNA sample using a backpack unit.

Story Credit: by Jesse MacDonald, Habitat Impact Assessment Manager, Maritime Aboriginal Aquatic Resources Secretariate, 2022.

INDIGENOUS PROTECTED & CONSERVED AREAS PROTECTING SPECIES AT RISK

by Kaitlyn Curran

The impacts of climate change have far reaching effects for numerous species across the globe. From the loss and destruction of coastal homes for mankind, to habitat loss for many other species such as the polar bear, or Nanook as called by the Inuit, and the Atlantic salmon or Plamu as it is known to the Mi'kmaq, more and more species are being added to the Committee on the Status of Endangered Wildlife in Canada (COSEWIC)'s list of endangered species, and there is limited progress on the species that are already listed as endangered. People around the world from local communities to Indigenous nations and state government are calling for increased action to stop the further destruction of Mother Nature. In Canada, there are a number of mandates and groups whose priorities include protecting and conserving land, waters and endangered species in the face of climate change and other threats to species and the environment. Two examples of Canadian conservation measures are COSEWIC and Indigenous Protected and Conserved Areas (IPCAs), the second of which aims to contribute to the global challenge to protect 30% of lands and waters by 2030. Both COSEWIC and IPCAs will be essential in advancing conservation efforts in Canada, while IPCAs will be especially important in advancing Indigenous Rights as through them, the Canadian government acknowledges the wealth of knowledge that Indigneous Peoples hold in relation to the environment.

SPECIES AT RISK

COSEWIC was established in 1977 to provide Canadians and their governments with advice regarding the status of wildlife species that are nationally at risk of extinction or extirpation (see Table 1 for definition). These species are identified and assessed for their risk of extinction using science, Aboriginal Traditional Knowledge and community knowledge. Once a species has been identified as having the potential to be at

TABLE 1. COSEWIC STATUS CATEGORIES AND DESCRIPTIONS	
COSEWIC Status Categories	**Description**
Extinct (X)	A wildlife species that no longer exists
Extirpated (XT)	A wildlife species that no longer exists in the wild in Canada, but exists elsewhere
Endangered (E)	A wildlife species facing imminent extirpation or extinction
Threatened (T)	A wildlife species that is likely to become endangered if nothing is done to reverse the factors leading to its extirpation or extinction
Special Concern (SC)	A wildlife species that may become threatened or endangered because of a combination of biological characteristics and identified threats
Data Deficient (DD)	A category that applies when the available information is insufficient (a) to resolve a wildlife species' eligibility for assessment or (b) to permit an assessment of the wildlife species' risk of extinction
Not At Risk (NAR)	A wildlife species that has been evaluated and found to be not at risk of extinction given the current circumstances

risk, biological information is collected and used to determine the status of the species. COSEWIC uses a classification system to rank individual species based on their risk of extinction or extirpation (Table 1). As of 2022, 64% of wildlife species show no change in status and 17% are now in a higher risk category. 19% of species are in a lower risk category, however this is likely due to improved information rather than actual changes in the condition of the wildlife species. Once a certain species is given a status, those at the greatest risk of extinction or extirpation in Canada are prioritized for attention.

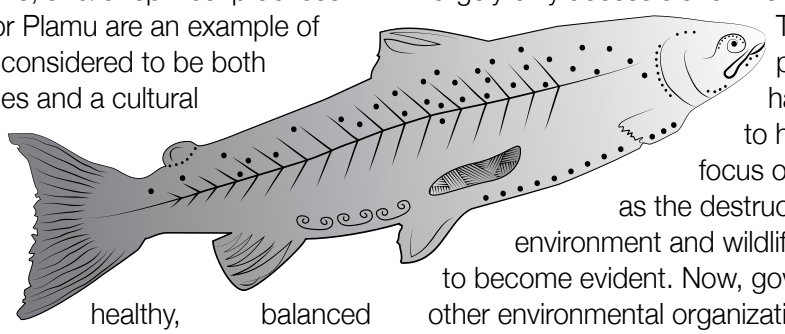
In 2003, the Species at Risk Act (SARA) was proclaimed. The purpose of SARA is to protect wildlife species at risk in Canada. Within the Act, COSEWIC was established as an independent body of experts responsible for identifying and assessing wildlife species considered to be at risk. This is the first step towards protecting wildlife species at risk as the wildlife species that have been designated by COSEWIC may then qualify for legal protection and recovery under SARA. SARA also provides for the establishment of two committees by Environment Canada that are significant to Indigenous Peoples: The National Aboriginal Council on Species at Risk (NACOSAR) and the Aboriginal Traditional Knowledge Sub-Committee (ATK-SC). NACOSAR advises the Minister of the Environment on the administration of SARA and provides advice and recommendations to the Canadian Endangered Species Conservation Council. The ATK-SC provides expertise on Aboriginal Traditional Knowledge in conducting COSEWIC assessments and reports, and assists in the incorporation of Aboriginal Knowledge into COSEWIC's species status assessment and classification processes.

KEYSTONE SPECIES

Although the COSEWIC does not consider socioeconomic importance or even the importance for ecosystem function as being reasons for species prioritization, many species

at risk also have those important functions. In the ecological sense, these are called keystone species. In the late 1960s, Robert Paine coined the term "keystone species" to describe a species that holds their ecosystem in check by feeding on species that would otherwise dominate the ecosystem. The definition of a keystone species has since changed and now more generally describes any species that are key in maintaining the integrity of the ecosystems they belong to. Examples of keystone species include the beaver, starfish, sea otters, wolves and elephants.

Just as certain species of plants or animals appear to have a particularly large influence on the ecosystem they inhabit, the same is true in social systems. Scientists, Garibaldi and Turner have termed these organisms "cultural keystone species" and define them as species that shape the cultural identity of a people, as reflected in the fundamental roles these species have in diet, materials, medicine, and/or spiritual practices. Atlantic salmon or Plamu are an example of a species that is considered to be both a keystone species and a cultural keystone species. In the ecological sense, Plamu are important for maintaining healthy, balanced and productive ecosystems as they are a food source for larger ocean creatures when spending time in the ocean, and transport nutrients from the ocean once they have returned to the river to spawn. Plamu are also important for the Mi'kmaq as they are one of the many animals that contributed to Mi'kmaq sustenance and are still important today for many Mi'kmaq communities during special occasions such as pow-wows or other large gatherings (Denny & Fanning, 2016). Other examples of cultural keystone species that are also considered to be a species at risk in Canada include the Nanook, or the polar bear, and woodland caribou.



INDIGENOUS PROTECTED AND CONSERVED AREAS (IPCAS)

One of the ways in which species at risk are protected are through the establishment of protected areas. The Convention on Biological Diversity defines protected areas as "a clearly defined geographical space, recognized, dedicated and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values". Historically, the protection of natural areas in Canada has been associated with the displacement and dispossession of Indigenous Peoples and their traditional lands which has resulted in trauma that extends generations for these communities as their identities, histories, and cultures are rooted in their ancestral landscapes. The preservation of natural areas began with the aim of enabling places for tourism, recreational activities and hunting, for example, which at the time were largely only accessible for the elitist community. The goals for protecting areas have since changed to have a larger focus on conservation, as the destruction of the environment and wildlife species started to become evident. Now, governments and other environmental organizations are looking to Indigenous Peoples to share their traditional knowledge about the land to assist in the global mission of protecting 30% of lands and marine environments by 2030.

Indigenous communities account for 5% of the global population, while they protect around 80% of biodiversity. The right of Indigenous Peoples to conserve and protect the environment and the productive capacity of their lands or territories and resources was officially acknowledged on September 13, 2007 when the General Assembly of the United Nations adopted the resolution of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) (United General

Assembly, 2007). 14 years later, on June 21, 2021, UNDRIP received royal assent in Canada, declaring that the laws of Canada will be made consistent with UNDRIP. Canada has been attempting and failing to conserve areas to meet global conservation targets for the past 12 years. Now with the goal of protecting 30% of lands and waters by 2030 quickly approaching, but only having 13.5% of its terrestrial area (land and freshwater) and 13.9% of its marine territory currently protected, Canada is starting to put UNDRIP into action. Canada is finally offering support to Indigenous communities across the country to establish Indigenous-led area-based conservation efforts such as Indigenous Protected and Conserved Areas (IPCAs).

> IPCAs are defined as: "…lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through Indigenous laws, governance, and knowledge systems. Culture and language are at the heart and soul of an IPCA" (ICE, 2018, p 5).

Indigenous Peoples involved in the IPCA process in Canada have stated that this target could "be achieved overnight if Canada truly adopts the UNDRIP, the 94 calls to action of the Truth and Reconciliation Commission of Canada, and finally honours the Peace and Friendship Treaties that form the constitutional foundation of the nation" (IUCN, 2018).

There are many examples of Indigenous-led conservation initiatives throughout Canada currently and historically, but only recently has the government started providing funding for such initiatives. In 2018, Canada launched a project called The Target 1 Challenge which aimed to conserve 25% of Canada's land and 25% of its oceans by 2025 by investing in conservation projects. Many projects will be identified as IPCAs and some will include the protection and conservation of species at risk as being one of their main objectives. The Minashkuau Kanakutuataku (Innu Parks Project) led by the Innu Nation in Newfoundland and Labrador is an example of this. This project seeks to protect species at risk including the Peregrine Falcon and the Kuekuatsheu, know as ki'kwaju to the Mi'kmaq (wolverine). In the Innu culture, the Kuekuatshe is said to be included in many stories and teachings where the Kuekuatsheu often represents good-natured mischievousness. Species at risk are also targeted as a main objective for the Cree Eeyou Istchee lands co-managed by the Cree Nation Government in Québec. This project aims to protect species at risk and culturally significant species such as the woodland caribou, which are an important hunting species for the Cree nation. Traditional Cree hunting values and practices are encouraged among community members who are concerned about conservation of the species.

On September 23, 2022, Canada announced their continued support for protected areas projects across the country but with a specific focus on Indigenous-Led Area-Based Conservation (ILABC). The ILABC initiative provides funding to Indigenous Peoples to lead or co-lead the establishment and recognition of protected areas across Canada. ILABC will contribute to conserving 25% of land and inland waters by 2025, and 30% of each by 2030. These protected areas will aim to provide positive environmental and cultural impacts on the community, such as increasing connectivity, climate change adaptation or mitigation, habitats for species at risk, language, transfer of knowledge between Elders and youth, as well as contribute to the overall health and wellbeing for the community. There are various IPCA/ ILABC initiatives being considered in Mi'kma'ki (The Maritimes).

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Protecting, respecting, and caring for biodiversity and habitats has its genesis in Aboriginal Peoples world view, traditional knowledge, and oral tradition. Aboriginal communities and Aboriginal organizations have worked hard to raise public awareness about the perils of habitat destruction and the loss of this region's biodiversity. Species at Risk...leave no footprint is the culmination of many years of involvement with likeminded interests. This visual point-of-fact book produced and published by the Maritime Aboriginal Peoples Council outlines, in brief summary, the biology, habitat, threats, and simple actions which we can all adopt to end the extermination. The number of subjects to choose from was many on the long list of Species at Risk. The twenty subjects portrayed, each have a message to those of us who trespass or enter their habitats. They are telling us that our ignorance and inaction is destroying their habitats, killing their young, and poisoning their food, water, and air.

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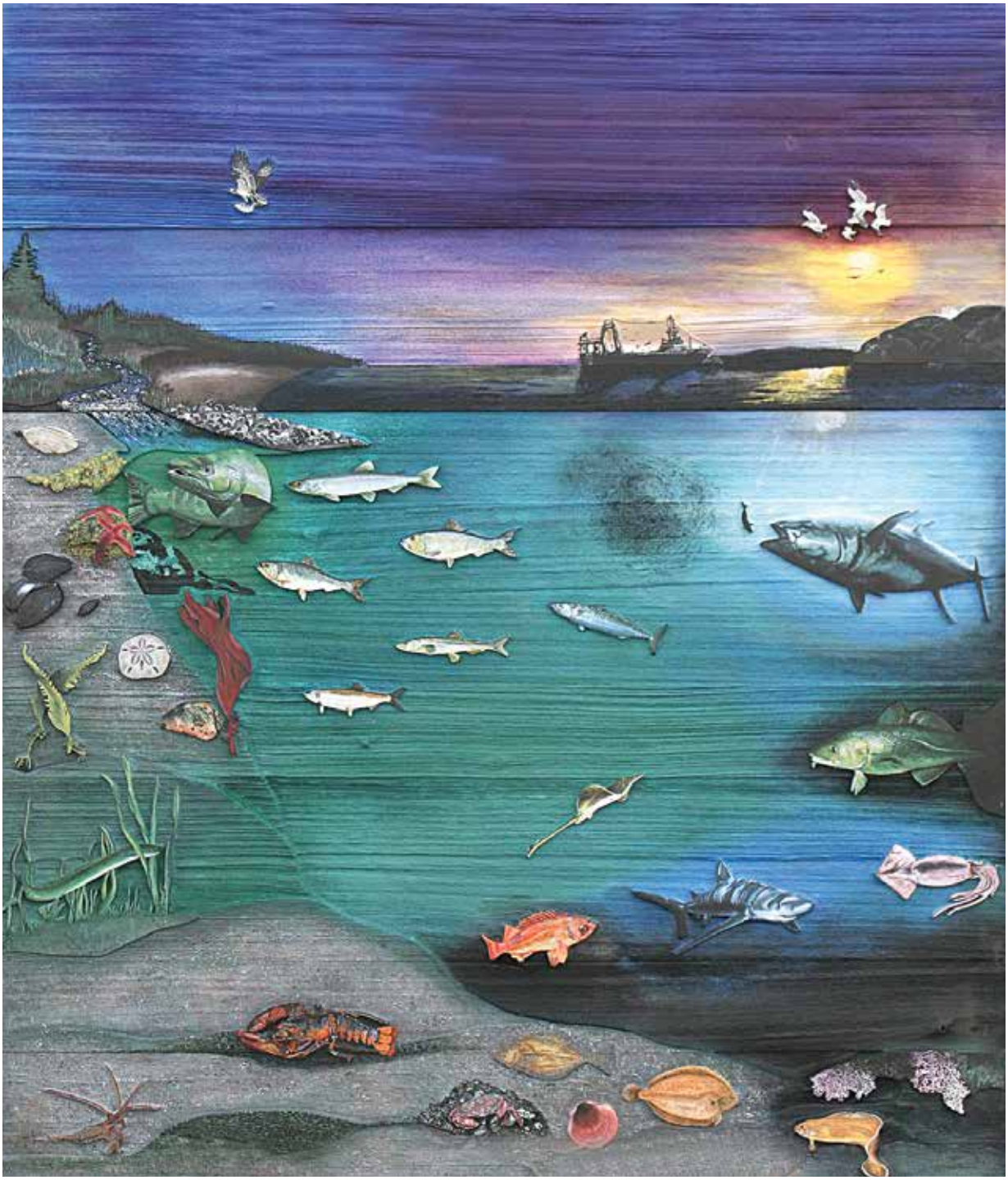

Carving depicts the struggle of some of our aquatic species at risk. Carving by Don P. Fraser.

Story Credit: by Kaitlyn Curran, Environment and Biodiversity Advisor, Maritime Aboriginal Aquatic Resources Secretariate, 2022

THE UNITED NATIONS' SUSTAINABLE DEVELOPMENT GOALS

by KAITLYN CURRAN

In September 2015, Canada and all other 192 United Nations (UN) Member States adopted the 2030 Agenda for Sustainable Development at the UN General Assembly. This initiative is a global call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity by 2030. 17 broad sustainable develop goals (SDGs) guide this overarching goal of not leaving anyone behind (Figure 1.) All 17 SDGs are relevant to Indigenous Peoples and directly linked to the human rights commitments outlined in the UN Declaration on the Rights of Indigenous Peoples, and the Truth and Reconciliation Commissions Calls to Action and Calls for Justice arising from the National Inquiry into Missing and Murdered Indigenous Women and Girls. However, there is currently no mention of decolonization, addressing land claims, or environmental degradation of traditional lands that affect Indigenous Peoples within the 2030 Agenda for Sustainable Development. In March 2022, at the Canadian Together|Ensemble conference, many speakers spoke of the need to put reconciliation with Indigenous Peoples in Canada at the heart of the SDGs.

There are many examples of Indigenous-led initiatives to advance the SDGs in Canada. One example is the pan-Canadian not-for-profit platform, the Indigenous Clean Energy Social Enterprise. This organization targets Goal #7, Ensure access to affordable, reliable, sustainable and modern energy for all, by advancing Indigenous leadership within Canada's clean energy sector. Another example is the Coastal Guardian Watchmen program along the North Pacific Coast of British Columbia

Figure 1: Sustainable Development Goals (SDGs) (United Nations, n.d.).

which advances SDG #14 Life Below Water. This program utilizes a stewardship model to ensure that natural resources are sustainably managed, that rules and regulations are followed and that land and marine use agreements are implemented effectively.

Here at the Maritime Aboriginal Peoples Council/Maritime Aboriginal Aquatic Resources Secretariate (MAPC/MAARS), while we certainly keep all of the SDGs in mind when developing projects and engaging on various topics, we have chosen to focus on five of the SDGs listed in the table below. We chose to prioritize these five SDGs based on our ability to adequately incorporate these goals within the projects under our mandate. Our projects at MAPC/MAARS are focused on establishing a platform for Aboriginal Peoples in the Maritimes to engage on topics such as aquatic resources, ocean management, commercial fishing and other natural resource management issues. Therefore, the SDGs that we have decided to prioritize, either directly pertain to the environment and can be a focus of one of our projects, or are related to people and can be an integrated component within our projects.

As of 2021, for the second year in a row, the world was no longer making progress on the SDGs. The devastating global impacts of Covid-19 and other crises have resulted in many issues, one of which is sustainable development being an afterthought. Prior to 2021, the world was making some progress but was still not on track to achieve the SDGs by 2030. In Canada, achieving these SDGs are of the utmost importance to Indigenous Peoples as many of the

MAPC/ MAARS Priority SDGs	UN Performance Indicators	MAPC/MAARS Action Items
#3: Good health and well-being	• Subjective well-being	• Consider the well-being of Indigenous communities when reviewing development proposals and environmental assessments • Advocate for Aboriginal Rights and Treaty Rights when involved in natural resource engagement sessions • Integrate components of Indigenous community well-being within natural resource project design such as by providing opportunities for communities to be involved in science and connect with nature • Investigate ways to protect natural spaces and species that are important for Indigenous communities through the Species at Risk Act (SARA) and other forums
#5: Gender equality	• Ratio of female-to-male average years of education received • Ratio of female-to-male labor force participation rate • Seats held by women in national parliament	• Consider prioritizing Indigenous girls, women, Two Spirit, Lesbian, Gay, Bisexual, Transgender, Queer, Questioning and Intersex Plus (2SLGBTQI+) individuals for internship and employment opportunities • When developing projects which utilize Aboriginal Traditional Knowledge, prioritize listening to Indigenous girls, women, and 2SLGBTQI+ individuals
#13: Climate action	• CO2 emissions from fossil fuel combustion and cement production	• Focus on projects which support decreasing CO2 emissions such as clean energy projects, coastal/ forest restoration projects
#14: Life below water	• Average area that is protected in marine sites important to biodiversity • Fish caught from overexploited or collapsed stocks • Fish caught by trawling or dredging • Fish caught that are then discarded	• Support the advancement of protected areas and advocate for Indigenous-led initiatives or projects • Support environmentally friendly fishing practices within the Indigenous Communal Commercial and Food, Social and Ceremonial fishery • Advocate for environmentally friendly fishing practices in non-Aboriginal fisheries
#15: Life on land	• Average area that is protected in terrestrial sites important to biodiversity • Average area that is protected in freshwater sites important to biodiversity • Red List Index of species survival • Permanent deforestation	• Support the advancement of protected areas and advocate for Indigenous-led initiatives or projects • Engage with partners on species at risk to support their conservation • Conduct conservation projects that are focused on species at risk

Table 1. MAPC/MAARS priority Sustainable Development Goals with the corresponding United Nations indictor and MAPC/MAARS action item which describes how we plan to incorporate the SDG within our projects.

issues that these goals seek to address are disproportionately felt by Indigenous Peoples. In a report on Indigenous Peoples and the SDGs in Canada by the National Collaborating Centre for Aboriginal Health, one of the recommendations was to develop Indigenous-specific SDG targets and indicators, including targets on community poverty, food security, health and well-being, education, gender equality, water and sanitation. The hope of these Indigneous-specific targets would be to directly improve the lives of Indigenous Peoples and their communities, as currently, not enough is being done in Canada or globally. While addressing some of these SDGs would be outside of the expertise of the existing MAPC/MAARS team, we are working to incorporate the goals that we can within our projects to the best of our ability.

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Story Credit: by Kaitlyn Curran, Environment and Biodiversity Advisor, Maritime Aboriginal Aquatic Resources Secretariate, 2022

Marine Spatial Planning & Offshore Renewable ENERGY IN THE MARITIMES

by KATE SPOONER

The ocean is a miraculous environment. It is home to thousands of species, influences global weather and temperature, and it is where various human activities take place on its surface and at its deepest depths. Shipping, offshore oil and gas, renewable energy, fishing and aquaculture, and recreational boating are just a few examples of the activities that occur within the ocean space. It is important that as human activity in the ocean intensifies, governments and communities incorporate planning processes to guide ocean use. One type of planning process is marine spatial planning. As a management process, marine spatial planning guides the use of marine spaces and resources while incorporating ocean conservation. A marine spatial plan is meant to guide where and when human activities take place within a designated ocean space, prioritizing a balance the growing demand for industry development with the need to protect the environment. In Canada, marine spatial planning has been led by the Fisheries and Oceans Canada (DFO) across five bioregions, one being the Bay of Fundy/Scotian Shelf. It is the hope of the government that through more efficient management of ocean spaces, which includes marine spatial planning efforts, Canada will be able to achieve national and international conservation targets while maintaining economic prosperity for those in marine industries.

While the Canadian government has yet to develop a marine spatial plan for Canada, it is important for governments, private marine developers, and citizens alike, to consider the spatial planning

Figure 1 DP Energy Tidal Turbine Prototype

processes for the marine regions where new offshore project developments are underway. There has been ongoing engagement with the public about offshore renewable wind and tidal energy projects in the Maritimes region. It will be crucial that governing bodies utilize concepts of marine spatial planning to consider how new developments in Canada, like offshore wind, will interact with other marine activities. To simplify the two concepts of marine spatial planning and offshore renewables, it is easiest to compare them to on-land urban planning. A well-designed city considers aesthetics and functionality and incorporates the need for vital community infrastructure, including: housing, transportation, recreation, and

Figure 2 Aerial View of Fundy Ocean Research Center for Energy (FORCE) in Parrsboro, NS

education, while considering where these anthropogenic components best operate. It is understood that certain land uses interact well together, such as residential areas and green space, and others have conflict such as an industrial area next to residential space. The same can be applied to the marine area through marine spatial planning. Certain human activities can coexist while others must be isolated. Relating back to offshore energy, a proposed offshore wind turbine farm should not coincide with shipping lanes; however, wind turbines could share the site with aquaculture pens. The reduction of sectoral conflicts benefits industries, conservation efforts and provide an opportunity for new collaborations.

Many countries, including Canada, are introducing new sustainable industry practices in the ocean in an attempt to maintain natural resources, protect species at risk and the environment as a whole, for generations to come. Of the numerous human activities taking place in the ocean, offshore renewable energy projects continue to grow in popularity as an industry that supports the advancement of sustainability efforts by contributing clean, reliable energy to a country's power supply. This growth won't continue without planning though; guidance and agreement are needed for offshore projects to thrive, and are requirements which marine spatial planning can facilitate.

Offshore renewable energy projects include: tidal energy, wave energy, river current and offshore wind. Both tidal and offshore wind are being explored for the Maritimes region, with tidal technology (see Figure 1) tests taking place in 2022

Figure 3 View of Tidal Turbine Berths at FORCE.

and beyond at the Fundy Ocean Research Center for Energy (FORCE) site in Minas Passage, Bay of Fundy (see Figures 2 and 3). In Atlantic Canada, the federal government has taken steps to explore the future of offshore wind power-generating projects by working with provincial, local and Indigenous governments to plan and conduct a regional assessment for areas offshore Nova Scotia. This assessment will define goals, objectives, geographic boundaries, activities, outcomes and governance structures for potential offshore wind projects in the region. While both offshore wind and tidal energy are in the early stages of development, there is limited time for marine planners to consider the interaction of offshore renewable energy industries with other activities in the ocean to better understand potential conflicts and benefits. For example, offshore wind development has begun off the coast of Newfoundland and Labrador and Nova Scotia. It will be a responsibility of the federal government to take a proactive approach guiding where these developments take place to limit political, economic and environmental conflicts in the future. And as marine spatial planning policy continues to progress into feasible practice, the sustainability of the ocean should remain the top priority of government to conserve marine space and the biodiversity within it.

Story Credit: by Kate Spooner, Marine Spatial Planning Facilitator, Maritime Aboriginal Peoples Council, 2022

COASTAL EROSION ON NCPEI WILDLIFE MANAGEMENT AREA & OUR PROTECTIVE WETLANDS

by CLARA JANE WOOD

Keska' tupkwan iapjiw (the land disappears forever…) Iapjiw aji'psutm (… though I am forever hopeful)

Avid readers of MAWQATMUTI'KW may recognize this property. The St. Chrysostome Wildlife Management Area (WMA) was introduced in the Fall-Winter 2021 Issue 13 on Page 88, discussing the NCPEI's stewardship plan for the large, untouched acreage. The article shared pictures of the WMA including a photo of its coastline surrounding the Egmont Bay, looking towards the WMA stream. The beach was a typical south-shore beach on PEI having red sands, lots of sandstone, driftwood, and occasional accumulations of river rocks. There were no dunes on this shoreline but kilometers of irregular banks that were no more than 4 feet high. These banks were covered in vegetation including rhizomes, salt-hardy shrubs, grasses, and standing deadwood/snags. The bank was home to countless birds, pollinators, and small mammals (we haven't observed them, but we see their tracks).

Today, we see an entirely different coastal topography than we originally saw our first summer in 2021.

During the early hours of September 24th, 2022, PEI was struck by the strongest hurricane it has seen in a long time. Many locals have called it the worst storm they've even seen on PEI in their lifetime. Hurricane Fiona severely impacted folks' wallets and nerves. We recognize that along with the irreversible damage to the environment, the damage to the people of the Wabanaki region (North-East Canada) has been tremendous, long lasting, and devastating.

As described in the first NCPEI Mawqatmuti'kw article, NCPEI is the proud landowner of a WMA in St. Chrysostome,

Photo credit: Clara Jane Wood

located within western PEI. This WMA is almost 300 acres made up of varying ecosystems including coast, wetland, freshwater and brackish streams, man-made plantations, and natural woodland. Eventually this natural area will be a large acreage used for land-based training and healing for NCPEI community members. NCPEI is currently using this land for research and monitoring efforts, including coastal erosion monitoring along the shoreline of Egmont Bay in the Northumberland Strait. Coastal erosion monitoring provides insights into how quicky and where coastlines are eroding, which is essential to know for erosion adaptation and/or mitigation efforts in the future. Our environmental team started monitoring the area in the summer of 2021.

Fast forward to the end of September 2022 and Eastern Canada is hit by “Fiona” – the strongest hurricane PEI has seen in decades. The storm surge rocked Islanders for 2-3 days, leaving nothing but devastation and frustrations behind. The strength of the hurricane happened to be of circumstance; the height of the storm surge occurred at the exact time that high tide had arrived. It is not lost on us the impact and damage Fiona has caused on our community, elders, children, and wallets. Saying this, we believe it also necessary to address the irreversible and extensive environmental damage Fiona has caused on the coastline of the WMA in St. Chrysostome, which could help paint the picture for other coastlines across PEI.

Coastal erosion monitoring efforts alongside naturally occurring wetland

Photo credit: Clara Jane Wood

ecosystems are strong adaptation and mitigation tools against coastal erosion, which is seriously relevant when facing an ever-increasing number of climate change related high energy storm systems. Both these tools are (directly and indirectly, respectively) being implemented in the St. Chrysostome Wildlife Management Area.

The method that our environmental team uses for taking coastal erosion measurements is called the Peg-Line method modeled after the UPEI Climate Lab methodology. This method is straightforward and can be done by anyone with coastal properties. The minimum materials to use are stakes (we use wooden, but you can use any resilient material), and a long measuring tape. Each location has two stakes (or pins); one pin is installed 5 meters from the clearest "bank" or where the sand meets clay/soil. The second pin is then installed another 5 meters back from the first stake (10 meters from the bank). This second stake provides a direction to line-up the first pin to. Using this method, whoever is measuring can make sure they are measuring from the same point every time. Measurements should be taken at regular intervals throughout the year with at least one year of monitoring to get meaningful results. We also recommend to GPS the locations of your pins, especially if the pins are within a grassy/shrubby area. In the WMA, locations for measuring were chosen in intervals along the coastline to get a larger idea of how the shoreline is eroding overall because not all areas will erode evenly or at the same time.

Photo credit: Clara Jane Wood

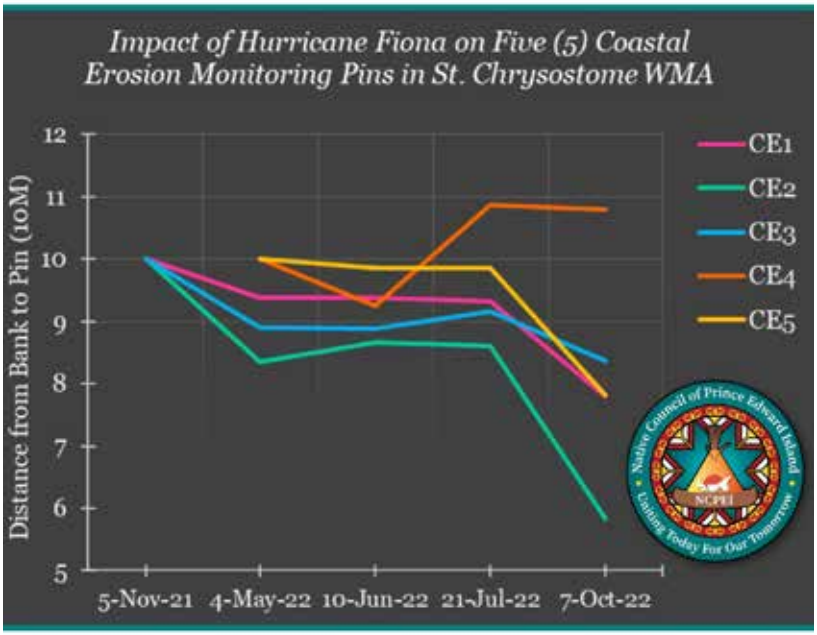

Figure 1: This line chart depicts the results of NCPEI's coastal erosion measurements from November 2021 to October 2022 within the St. Chrysostome Wildlife Management Area (WMA). Our five monitoring locations have been designated "CE1-5". Key dates are 7 October 2022, as that is the "post-Fiona" data and 4 May 2022 was the date CE4 and CE5 were partially installed. Increases in coastal area (such as CE4) could be due to increased vegetation, lateral sediment deposition, or human error. The biggest loss of land occurred at CE2 having ~ 2.77m of loss. The least impacted location was CE4 which depicts slight land formation. It is noted that the graph may be slightly misleading due to irregularity of dates/ times; this was due to a busy field season, and a last-minute hurricane.

We have been monitoring the WMA coastline since Summer 2021. We try to get out to take our measurements every month or sooner. From month to month, we would generally see 1-2 inches or less of land loss across our 5 measuring locations; understanding that our measurements could include human error. On Oct 7, 2022, the environmental team trekked out into the WMA to do a "post-Fiona" monitoring session. It wasn't long before we knew the coastline would be changed forever.

Like mentioned before, our stakes were originally placed 5 and 10 meters back from the bank of the shore. Currently, the first 5-meter pins are all gone. With wind and tidal energy, the 5-meter stakes must have blown or washed away. Please refer to Figure 1 to see the results of our coastal erosion monitoring, up until October 7, 2022. In short, erosion had occurred at an increased rate for four out of our five locations after hurricane Fiona when compared to previous coastal erosion measurements.

So – some land was lost – what can we learn from this extreme weather event, and why should we care? While it obviously decreases property values,

Figure 2: This aerial photo from Google Earth depicts the specific locations of the 5-meter pins and the 10-meter pins. Locations of pins were arbitrarily chosen and logged via Garmin GPS. Pins CE4 and CE5 were implemented on the 4 May 2022, and only one stake could be installed at the time.

Photo credit: Clara Jane Wood

erosion of land can increase sedimentation in waterways by removing important vegetation, roots, trees, and more which would grab hold of the soil particles to prevent them from eroding away. Increased sedimentation decreases the quality and quantity of habitat for aquatic species and animals. Erosion on PEI is an example of a positive feedback loop – where more erosion leads to more flooding due to the area having less water retaining qualities, and more flooding leads to more erosion and so on. On PEI, healthy beach ecosystems provide a buffer to salt water being washed up into the land beside it. Erosion increases the chance of "saltwater intrusion", where salt water can end up in freshwater systems including our drinking water. This is problematic because us and all other forms of life require fresh water to sustain and thrive. PEI has a high proportion of coast, with majority of the population living near the coast, making our chances for saltwater intrusion therefore even higher. Cumulative pressures from other freshwater consumption activities (consumer overconsumption and waste, agriculture, etc.) introduces additional threats to our singular freshwater aquifer. Sandy beaches are not the only ecosystems that provide erosion protection; wetlands are also amazingly productive areas that have a surprising amount of climate resilience.

As we continued to walk along the hurricane-damaged coast, we came across something that was pleasantly surprising – an unchanged wetland. For our team, it was an important learning moment as we had seen in person the stark contrast between a damaged beach ecosystem versus a relatively unaffected wetland. Many of our water quality measurements are taken along the freshwater stream that leads to Egmont Bay, and into the Northumberland Strait. This stream flows through a wetland and estuary. While we walked over the bank and looked through the remaining vegetation it looked as it did prior to the hurricane.

At first glance, the wetland looks bare and gloomy. It is a meadow of mostly grasses and seaweeds that have flowed up during high tide. Within the wooded area there are only a handful of toppled trees (which could be a great thing for roosting myotis sp. and birds). It looks unassuming, but this and other wetlands can absorb huge amounts of tidal and wind energy due to the characteristics of the soil, the abundance of rooting grasses and other salt-tolerant plants, and the amount of water already retained in the area. The fact that this ecosystem has the power to defend against flooding and storms is a magnificent justification as to why we, as stewards of our land, need to protect our wetlands and coastlines for us, the environment, and all generations to come.

Although devastating to see the land loss along the coast, it was a pleasure to be able to compare the two regions of coastline and wetland in person and through photos to see environmental theory come to life in a practical way. We'll be able to use this knowledge to better advocate for conservation of wetlands across Epekwitk including our very own in St. Chrysostome.

We hope you enjoyed reading this article. If you have any questions or inquiries, please feel to reach out to us via the contact information provided on our website "ncpei.com".

Nmu'ltes, until next time,

Story Credit: by Clara Jane Wood, Environmental Technician, Native Council of PEI, 2022.

A RIGHT TO A HEALTHY ENVIRONMENT

by Joshua McNeely

Bill S-5 (previously Bill C-28), Strengthening Environmental Protection for a Healthier

Canada Act, would, if passed, amend the Canadian Environmental Protection Act (CEPA). The majority of these amendments are concerning chemicals management, such as the Plan of Chemical Management Priorities, that serves as a "Watch List" of substances of potential concern, and would require the Minister to consider impacts to vulnerable populations and the cumulative effects of chemicals when conducting and interpreting the results of risk assessments. I won't go into detail here, but many are worried about other changes, such as repealing the requirement to "virtually eliminate" toxic substances found on Schedule I, or amending CEPA to better respond to the threats of genetically modified living organisms or electromagnetic radiation pollution. I'll provide links below to a couple of other organizations' submissions which go into detail on these amendments.

What I want to talk about today is Bill S-5's introduction of a new right into Canadian law – the right of every Canadian to a healthy environment. I also want to consider this Right to a Healthy Environment in the context of another preambular statement in S-5, the commitment to implementing the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP).

"Whereas the Government of Canada recognizes that every individual in Canada has a right to a healthy environment as provided under this Act"

"Whereas the Government of Canada is committed to implementing the United Nations Declaration on the Rights of Indigenous Peoples, including free, prior and informed consent".

A reference to UNDRIP, even in the preamble of an Act, in my mind carries a lot of promises, because those rights constitute the minimum standards for the survival, dignity and well-being of Indigenous Peoples. And I really like the Senate's addition to S-5 to include the term free,

prior, and informed consent (FPIC). Consent is one of the most powerful expressions of self-determination.

Despite these advancements, there are several shortcomings. For one, the Right to a Healthy Environment is expressed in a piece of federal legislation, not the Canadian Constitution, so there are serious questions about how much legal recourse Canadian's may have to defend this right. Second, Bill S-5 uses several modifiers to subject this right to other considerations, such as economics. Also, the right is not clearly spelled out in S-5 and left to be determined through the creation of an implementation plan. Implementation of the UNDRIP Act is also extremely vague at this time as many details of that Act are also left to the development of an implementation plan; which I might add that the off-reserve Indigenous Peoples have had little opportunity to provide input on so far.

I'm involved in the work at the UN, because the UN has been vital, especially for Indigenous Peoples, to articulate fundamental human rights, investigate rights violations and hold States accountable. Also, the nature by which international law comes about is one of consensus among States, or at least UN member States general goals of protecting the dignity and worth of the human person and reaffirming faith in fundamental human rights. So, for example, regarding Canada's 'NO' vote in 2007 on the adoption of UNDRIP, there was considerable pressures both within Canada and internationally for Canada to comply with it, because the human rights expressed within were already generally accepted long before UNDRIP. Canada did eventually adopt UNDRIP into national legislation on June 21, 2021.

At the international level, several documents have been adopted which draw on the interlinkages between the protection of the environment and the protection of human rights, such as a UN General Assembly Resolution 76/300 passed in August this year and a UN Human Rights Council Resolution 48/13 passed last year, both of which recognize that clean, healthy, and sustainable environments are fundamental human rights.

"[E]nvironmental degradation, climate change, and unsustainable development constitute some of the most pressing and serious threats to the ability of present and future generations to enjoy human rights, including the right to life. [T]he exercise of human rights, including the rights to seek, receive and impart information, to participate effectively in the conduct of government and public affairs and in environmental decision-making and to an effective remedy, is vital to the protection of a clean, healthy and sustainable environment."[i]

Here we see the two sides of what I believe to be complimentary rights: 1) protection of the environment is fundamental to meeting all other human rights, and 2) it is through exercising human rights that we are able to protect the environment.

With S-5 we also have what I believe to be at least a tenuous link between the protection of human rights and the protection of the environment via the references to UNDRIP and the right to a healthy environment. I'd like to see this recognition more explicitly in S-5, like in the UN General Assembly resolution; which Canada voted yes on.

If we are to work with what is currently in S-5, then the reference to UNDRIP should be interpreted as a tool for Indigenous Peoples to protect their rights, including their right to a healthy environment. Although UNDRIP does not contain the specific words "right to a healthy environment", it does contain numerous articles declaring Indigenous Peoples' rights to lands, territories, and resources, including the protection and sustainable development of those, as well as rights to their health and traditional medicines.

I believe the protection of Indigenous Peoples' rights is best done by Indigenous People themselves through their own representatives and institutions. Essentially, the control of lands, territories, and resources by Indigenous

i UN Human Rights Council. 48th Session, Resolution 48/13: The human right to a clean, healthy and sustainable environment. Oct. 18, 2021. A/HRC/RES/48/13

Peoples support the development of Indigenous institutions, which in turn express and protect Indigenous Peoples' rights. Indigenous Peoples' eco-centric worldview of interconnectedness and interdependency within our natural world requires that our expressions and protections of our human rights correspond directly, even indistinguishably, with environmental rights.

And by environmental rights, I'm not simply talking about a human right to a healthy environment, I also mean the concept existing in many Indigenous Peoples' customary laws that the environment, or Mother Earth, also has inalienable rights which we must respect. While UNDRIP does not contain any recognition of the rights of Mother Earth, Indigenous Peoples have adopted such a declaration.

"Just as human beings have human rights, all other beings also have rights which are specific to their species or kind and appropriate for their role and function within the communities within which they exist. The rights of each being are limited by the rights of other beings and any conflict between their rights must be resolved in a way that maintains the integrity, balance and health of Mother Earth"[ii]

Although S-5 does not explicitly define the right to a healthy environment, the link between the protection of human rights and the protection of the environment, is clearly drawn by the UN Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment; who has laid the groundwork for interpreting this right through a set of Framework Principles. calls for recognizing and protecting Indigenous Peoples rights to lands, territories, and resources, FPIC, protecting traditional knowledge and practices, and fair and equitable benefit sharing.

"States should ensure that they comply with their obligations to indigenous peoples and members of traditional communities, including by (a) recognizing and protecting their rights to the lands, territories and resources that they have traditionally owned, occupied or used; (b) consulting with them and obtaining their free, prior and informed consent before relocating them or taking or approving any other measures that may affect their lands, territories or resources; (c) respecting and protecting their traditional knowledge and practices in relation to the conservation and sustainable use of their lands, territories and resources; (d) ensuring that they fairly and equitably share the benefits from activities relating to their lands, territories or resources."[iii]

Any person familiar with UNDRIP would immediately note that the above are the pre-conditions for self-determination. I will also note that the recognition to Indigenous Peoples rights to self-determination; lands, territories, and resources, and granting/withholding their free, prior, and informed consent were the very things which Canada opposed at the time of UNDRIP adoption.

Several other international organizations have also grasped the importance of linking Indigenous Peoples' rights to environmental protection.

"On the one hand, their rights, territories and livelihoods are seriously threatened by the world's demographic pressure, compounded by the extractive industries' appetite for resources. A widespread lack of respect of their cultures and rights has resulted in many communities being decimated, dispossessed of their lands and forcibly relocated. On the other hand, scientists increasingly recognize what indigenous peoples have been voicing for decades: while holding much of the world's diversity in terms of culture, language and spirituality, indigenous peoples are also the stewards of natural resources and guardians of biodiversity. This has brought increased interest to indigenous peoples in the aftermath of the climate change negotiations during COP 21 in Paris 2015, in that indigenous

ii Universal Declaration on the Rights of Mother Earth. Apr. 22, 2010. World People's Conference on Climate Change and the Rights of Mother Earth. Cochabamba, Bolivia

iii UN Human Rights Council. 37th Session, Agenda Item 3. Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment. Jan. 24, 2018. A/HRC/37/59.

peoples hold some of today's answers to tomorrow's challenges."[iv]

I mentioned earlier that free, prior, and informed consent (FPIC) is a vital expression of self-determination. I've tried to briefly summarize a few points from the FAO Manual on FPIC:

Free: Not only is consent to be free of coercion, but the process by which consent is arrived at also must be free of expectations, short timelines, and other conditions imposed by the entity seeking consent.

Prior: Means that the timeline to provide consent is to be determined by Indigenous Peoples and the project-related information provided to Indigenous Peoples must be provided at the earliest possible stage to comply with those timelines. This may even mean information shared at the conceptualization or financing stages, as well as throughout a project's life-cycle.

Informed: Not only must the description of the activities be complete and accurate about their size, scope, pace, impact, duration, etc., it must also be delivered in a manner that is accessible and understandable, including language considerations. For example, engineered drawings may be excellent, but are inadequate to an Indigenous organization which does not employ an engineer who can interpret those drawings and engage with the project engineers. Also, when considering the process by which Indigenous Peoples arrive at consensus, other culturally appropriate means may be required to directly inform community members.

Consent: As I said, consent is one of the most powerful expressions of self-determination. Therefore, Indigenous Peoples retain full control of the extent to which they give, or withhold consent, including the right to give consent with conditions. Consent is also an on-going process which is influenced by a wide variety of environmental, social, economic, and political factors and Indigenous Peoples retain the right to revoke or modify their consent at any time.

I feel we haven't even scratched the surface of FPIC for the protection of the environment, but I'm glad the Senate has highlighted it in S-5, lest policy makers gloss over the reference to UNDRIP.

As I said earlier, S-5 kicks the definition of the right to a healthy environment down the road, by requiring an implementation plan vs defining what it is in CEPA. In addition, the UNDRIP Act itself is also fairly vague and much of its substance left to the development of an implementation plan. There will need to be a lot of discussion over the course of the next few years to try to put some meat on these bones thrown to us by Parliament.

Submissions on Bill S-5 by partner organizations:

Canadian Environmental Law Association: https://cela.ca/submissions-on-bill-s-5-an-act-to-amend-the-canadian-environmental-protection-act/

Nature Canada: https://sencanada.ca/Content/Sen/Committee/441/ENEV/briefs/Brief_NatureCanada_e.pdf

Prevent Cancer Now: https://preventcancernow.ca/taking-action/reform/canadian-environmental-protection-act/

CELA and Nature Canada also partnered to produce the webinar series Where's the Protection – Review and Reform of the Canadian Environmental Protection Act (which includes this presentation by the author): https://cela.ca/wheres-the-protection-webinar-series-cepa/

Many other briefs on S-5 can be found on the website for the Senate Standing Committee on Energy, the Environment and Natural Resources: https://sencanada.ca/en/committees/ENEV/Briefs/#?TabSelected=UPCOMING&filterSession=44-1&CommitteeID=1005&PageSize=250&SortOrder=DATEASC

iv UN Food and Agricultural Organization. Free Prior and Informed Consent: An indigenous peoples' right and a good practice for local communities – manual for project practitioners. 2016. https://www.fao.org/indigenous-peoples/our-pillars/fpic/en/

A COMPELLING REASON

Almost all of these aerators at the Boat Harbour effluent treatment facility's aeration "lagoon" are now turned off, but it wasn't long ago that they were running constantly to add oxygen to the water to prevent eutrophication. Locals and visitors to the area will remember the strong odours that permeated everything around them. During operation, the aerators created an alien landscape of machinery rising from brown froth and mist.

The pulp and paper mill has gone through a few owners over the years, all of which have deposited their industrial waste into Boat Harbour, as did the Chlor-alkali plant. Currently, the paper mill is sitting relatively dormant while the politics play themselves out. I think it's fair to say that nobody wants a repeat of the actions that led to this ongoing nightmare for so many. A remediation project is ongoing and there is a significant amount of research taking place to find the best solutions to cleaning up the (physical) mess.

There are many lessons to be learned from Boat Harbour, but we have to be willing to look at the whole picture and learn from the different experiences felt by so many people along the way.

History repeats itself endlessly for those who are unwilling to learn from the past
- Leon Brown

Page 97 top right: before clean-up 2020

Page 97 bottom right: after clean-up 2022

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The objective of IKANAWTIKET Environmental Incorporated is: to promote the preservation of the natural environment by educating and informing the public about environmental issues, biodiversity in the Maritime Provinces, Aboriginal culture, Aboriginal worldview, and traditional knowledge in relation to the environment.

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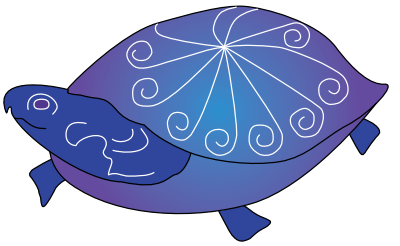

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More recently, online courses in ocean governance have provided a new way to offer training to individuals around the world. The next online course is provisionally scheduled for spring 2023. Another new offering has been a one-week workshop on Ocean Governance for Indigenous Peoples held in Halifax in December 2022. Planned for and with Indigenous Peoples from Mi'kma'ki, Wolastoqiyik and Peskotomuhkatik, this in-person event focused on key aspects of ocean and coastal governance with particular attention to Indigenous needs, perspectives and knowledge systems. Future workshops for Indigenous Peoples from other regions may follow. For details of our various programmes, please consult the Training section of the IOI-Canada website or contact ioi@dal.ca. *Photo credits: Mirella Leis*