

# Indigenous peoples and marine protected area governance: A Mi'kmaq and Atlantic Canada case study

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## Abstract

This research examines the potential challenges and opportunities for Mi'kmaq, the Indigenous peoples who have inhabited modern-day Nova Scotia and other areas of Eastern Canada for millennia, to play a greater role in marine protected area (MPA) governance in Canada. Given Canada's marine conservation objectives of 30% by 2030, there is a growing need for decisions affecting the establishment of MPAs to respect Indigenous rights, values, and knowledge. Using the Eastern Shore Islands (ESI) in Nova Scotia, Canada, an area of interest for MPA establishment, as a case study, we conducted 17 semi-structured interviews with both Mi'kmaq and non-Mi'kmaq participants involved in the ESI consultation processes. We used content analysis to identify key themes that respondents perceived to be affecting Mi'kmaq involvement in the federal MPA governance processes. Barriers to overcome included those deemed to be systemic within the current decision-making processes; limited understanding of Mi'kmaq culture, governance, and rights; limited clarity of Mi'kmaq rights, particularly those resulting in fisheries conflicts; and limited capacity. Opportunities highlighted the importance of meaningful consultation and understanding of Indigenous worldviews as well as the need for alternative approaches to state-led/top-down governance to improve Mi'kmaq participation in MPA governance in Atlantic Canada.

**Key words:** marine protected areas, Two-Eyed Seeing, Indigenous rights, Mi'kmaq governance, Atlantic Canada, marine conservation



Citation: Warrior M, Fanning L, and Metaxas A. 2022. Indigenous peoples and marine protected area governance: A Mi'kmaq and Atlantic Canada case study. FACETS 7: 1298–1327. doi:[10.1139/facets-2021-0128](https://doi.org/10.1139/facets-2021-0128)

Handling Editor: Nicole L. Klenk

Received: August 25, 2021

Accepted: June 13, 2022

Published: October 13, 2022

Note: This paper is part of a collection titled “Ärramät, the intersections of biodiversity conservation and Indigenous health and well-being”.

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Published by: Canadian Science Publishing

## Introduction

Marine protected areas (MPAs) are a well-recognized, effective conservation tool used to address biodiversity loss and the resulting impacts on social, economic, and cultural well-being ([Millennium Ecosystem Assessment 2005](#); [Dudley 2008](#); [Sala and Giakoumi 2018](#)). In the past two decades, international biodiversity and conservation initiatives (e.g., Aichi Target 11) have facilitated the accelerated rate of MPA implementation globally ([Maestro et al. 2019](#)). In Canada, MPA coverage has increased from 1% in 2015 to 8.9% in 2019 ([DFO 2020](#)). This trend is likely to continue with Canada's recent announcement of an MPA target of 25% by 2025 and 30% by 2030 ([Government of Canada 2019](#)).

With the affirmation of Indigenous rights in Canada's [Constitution Act 1982](#) (s. 25 and s. 35), and the recent passing of federal legislation ([UNDRIP Act 2021](#)) to implement the 2007 United Nation

Declaration for the Rights of Indigenous Peoples (UNDRIP) (UNGA 2007), the Canadian federal government *must* include Indigenous peoples and respect Indigenous rights in MPA governance. While MPAs may protect important resources for Indigenous communities, they may also restrict access, infringing on Indigenous rights and disproportionately affecting Indigenous peoples due to their high dependence on marine resources for livelihoods, sustenance, and cultural integrity (Ban and Frid 2018; Bennett et al. 2018; Eckert et al. 2018). The recognition and respect for Indigenous rights as affirmed in UNDRIP are increasingly being included in MPA management and governance around the world (Borrini-Feyerabend et al. 2013; WCEL 2019). This shift from a state-led, imposed approach to collaborative processes, co-governance agreements, and Indigenous-led approaches can facilitate a greater role of Indigenous peoples in decision-making (Bickford 2017). However, Indigenous peoples have been “rarely involved in MPA governance or management” (Ban and Frid 2018, p. 5) and still have limited recognized decision-making authority (WCEL 2019). With the ongoing pressure to increase MPA protection and the push for Indigenous rights recognition in Canada, there is added momentum for change that could improve Indigenous participation in MPA governance and provide opportunities for Indigenous values, interests, and knowledge to meaningfully inform the MPA process. Being proactive in finding ways to address this gap and facilitate improved Indigenous participation in MPA decision-making is therefore of utmost importance and urgency.

Using the Eastern Shore Islands (ESI) in Nova Scotia, Canada, an area of interest (AOI) for MPA establishment, our research examines the potential challenges and opportunities for Mi’kmaq, the Indigenous peoples who have inhabited modern-day Nova Scotia and other areas of Eastern Canada for millennia, to play a greater role in MPA governance in a way that respects Indigenous rights, values, and knowledge while meeting Canada’s marine conservation objectives. We conducted 17 semi-structured interviews with both Mi’kmaq and non-Mi’kmaq participants involved in the ESI consultation processes undertaken by the Department of Fisheries and Oceans (DFO). In this paper, we discuss mechanisms that could be implemented in the *Oceans Act* MPA process to facilitate the ability for Mi’kmaq to play a greater role in MPA governance, respecting their right to self-determination, and their values, interests, and knowledge in the MPA process.

This research was done in collaboration with Kwilmu’kw Maw-klusuaqn Negotiation Office, a Mi’kmaq organization that supports the Assembly of Nova Scotia Mi’kmaq Chiefs and Mi’kmaq communities in consultations and negotiations (KMKNO 2021). Kwilmu’kw Maw-klusuaqn Negotiation Office guided the research questions and reviewed the research proposal and interview questions. The research proposal underwent both Tri-Council Ethics approval (see [Supplementary Material A](#)) and Mi’kmaq Ethics Watch review (see [Supplementary Material B](#)), the review process undertaken by Mi’kmaq for all research conducted with Mi’kmaq. All participants signed a consent form, which adheres to free, prior, and informed consent principles (see [Supplementary Material C](#)). We also want to raise awareness among our readers that our study was conducted in Mi’kma’ki, the ancestral and unceded territory of the Mi’kmaq.

## Setting the context

### MPA governance approaches in Canada

MPAs in Canada are established primarily by three federal agencies, DFO, Environment and Climate Change Canada, and Parks Canada. Provinces and territories may also create MPAs within their jurisdiction (the seabed and the resources below the seabed in “inland waters” as defined in the [Oceans Act 1996](#)), but federal cooperation and legislation are required to protect the water column in inland waters (BC Parks 2007).

MPAs are identified through a network planning process but are implemented on a case-by-case basis by the relevant authority and legislation ([Government of Canada 2011](#)). For MPAs established under the *Oceans Act* (*Oceans Act* MPAs), the Minister of Fisheries and Oceans is responsible for coordinating and implementing this process in collaboration with stakeholders and Indigenous peoples (section 35(2), section 31 of *Oceans Act 1996*). This process follows a “top-down” governance approach where decision-making authority, responsibility, and power are retained by the Canadian federal government ([Government of Canada 2011](#)).

## Mi'kmaq governance

Mi'kmaq governance and knowledge system are interconnected and founded on Mi'kmaq beliefs, values, language, and knowledge ([Prosper et al. 2011](#); [McMillan and Prosper 2016](#)). Mi'kmaq Ecological Knowledge (MEK) “includes the collection and adaptation of knowledge that Mi'kmaq people have with all components of the natural environment and the interrelationships that exist between all life forms from a unique historical, cultural and spiritual perspective” ([ANSMC 2007](#), p. 7). Like other forms of Indigenous knowledge, MEK is holistic, dynamic, experiential, and intuitive and is encompassed within spiritual and cultural values. Knowledge is transferred intergenerationally and orally through storytelling, practical teachings, and cultural practices ([Berkas 2012](#); [McMillan and Prosper 2016](#)). Two key principles that are inherent in Mi'kmaq governance are *Msit no'kmaq* and *Netukulimk* ([Barsh 2002](#); [Denny and Fanning 2016a](#)). *Msit no'kmaq* is an epistemological concept whereby all living and non-living components are interconnected and all beings are considered as kin ([Denny and Fanning 2016a](#); [Prosper et al. 2011](#)). *Netukulimk* is a Mi'kmaq sustainability principle that “... guide[s] individual and collective beliefs and behaviours in resource protection, procurement, and management to ensure and honour sustainability and prosperity for the ancestors, and present and future generations” ([Prosper et al. 2011](#), p. 1).

While Mi'kmaq have their own governance structure, laws, processes, institutions, and customs, Mi'kmaq do not have full autonomy to make unilateral marine management decisions that apply to all Canadian citizens, nor does the Canadian government recognize Mi'kmaq authority and laws ([Denny and Fanning 2016a](#)). Colonial laws, institutions, and processes restrict Mi'kmaq autonomy and decision-making power. In Canadian MPA processes, Mi'kmaq governance currently occurs within a state-led framework, which is supposed to reflect adherence to Aboriginal and treaty rights. *Etuaptmumk* or “Two-Eyed Seeing”, coined by Mi'kmaq Elder Albert Marshall, is understood as learning to use the strengths of both Indigenous and western ways of knowing ([Bartlett et al. 2012](#)) and has been increasingly recognized as a tool to respect different knowledge systems in informing resource management decision-making.

## Mi'kmaq Aboriginal and treaty rights

Mi'kmaq Treaty rights are based on the negotiated Peace and Friendship Treaties (1725–1779) signed between Mi'kmaq peoples and the British Crown ([Wallace 2018](#); [Nova Scotia Archives 2020](#)). How Aboriginal rights and treaty rights are defined and exercised continue to be determined through the Canadian court system. We use the terms *Aboriginal* and *Indigenous* interchangeably to refer to the original inhabitants of the land that is now called Canada and include the Mi'kmaq. However, the term *Aboriginal* is used specifically in a legal context to be consistent with the legal text and rulings. As per [R. v. Sparrow \(1990\)](#), Aboriginal peoples have the right to fish for Food, Social, and Ceremonial purposes. Food, Social, and Ceremonial fisheries were ruled to take precedence over other fishing activities, except when conservation is of concern ([R. v. Sparrow 1990](#)). In [R. v. Marshall \(1999\)](#), the *Marshall* decision affirmed that Mi'kmaq have the “right to hunt, fish and gather in pursuit of a ‘moderate livelihood.’” Additionally, the Canadian government has a fiduciary “duty to consultation with and, if possible, accommodate” ([R. v. Haida 2004](#); [R. v. Taku River 2004](#)) where any

actions/activities have the potential to infringe upon Aboriginal or treaty rights directly or indirectly. Defining what constitutes a “duty to consult” is ongoing as Indigenous peoples continue to challenge the consultation processes adequacy in the Canadian court system (Gray 2016; Singleton 2009).

## Eastern Shore Islands case study

The ESI AOI case study provided an opportunity (1) to gain an understanding on how an *Oceans Act* MPA process may affect Mi’kmaq Aboriginal and treaty rights and (2) to provide new insights on improvements in Indigenous participation in MPA governance while respecting rights, values, and knowledge. The ESI AOI remains the first proposed large coastal MPA in Atlantic Canada and was in its early stages of the *Oceans Act* MPA process at the time of the research. This provided a unique opportunity to observe and participate in the engagement and consultation processes while the MPA process unfolded. The ESI AOI was the first proposed MPA site to have a designated Mi’kmaq-Crown consultation process, which provided further opportunity to understand key Mi’kmaq concerns and interests.

On 22 March 2018, DFO announced the ESI as an AOI identified through the DFO-led Scotian Shelf Network Planning process (DFO 2018b). The ESI AOI site extends northeast of Halifax, to a rural area of Nova Scotia from Clam Bay to Liscomb Point, and seaward from the low tide line to 25 km offshore, encompassing a total area of 2000 km<sup>2</sup> (DFO 2019a) (Fig. 1). The ESI site is an archipelago with island density three times greater than anywhere else in the Scotian Shelf Bioregion, the region over which DFO-Maritimes has jurisdiction. The area has high biological diversity, supporting a range of habitats and species including eelgrass beds, kelp beds, and saltmarshes, which are important for several invertebrates, fishes, and marine birds (DFO 2019a). The ESI area population is over 16 000 people (Rainville et al. 2016). It includes one Mi’kmaq reserve in Sheet Harbour with 25 individuals who are members of the Millbrook First Nation (Statistics Canada 2016). The ESI coastal communities are highly dependent on marine-based activities especially the commercial lobster fishery (DFO 2019b). The fear of fishing restrictions, primarily from some local commercial fish harvesters, generated considerable opposition within the ESI area, resulting in the creation of an association of Eastern Shore communities.

The AOI announcement initiated formal consultation and engagement processes that included community open houses, a community newsletter, a federal-provincial consultation table, a multi-stakeholder Advisory Committee, a Mi’kmaq-Crown consultation table (referred to as the Oceans Working Group with the Crown represented by DFO), and an Eastern Shore Fishermen’s Protective Association Working Group (DFO 2021a). The Mi’kmaq-Crown consultations followed the 2010 Mi’kmaq-Nova Scotia-Canada Terms of Reference. The Terms of Reference clearly outlines the consultation process for all parties where Crown governments are making decisions that may adversely impact Mi’kmaq Aboriginal and treaty rights (“Terms of Reference for a Mi’kmaq-Nova Scotia-Canada Consultation Process” 2010).

Since 15 August 2019, the ongoing engagement has stalled. However, the ESI AOI status remains open until December 2025 (DFO 2021a).

## Methodology

The ESI AOI case study is a multi-use multi-user coastal area. As such, we targeted both non-Mi’kmaq and Mi’kmaq individuals involved in the ESI MPA process to obtain a well-rounded understanding of perceived challenges and opportunities facing Mi’kmaq regarding the current MPA process. We deemed this important to gain a better understanding of the diversity of perceptions, to identify areas of commonalities and differences in perceptions, and to use this knowledge to inform potential recommendations based on the study findings.



Fig. 1. Eastern Shore Islands area of interest (DFO 2021b).



Table 1. Participant groupings and number of interview participants.

Participant groups		Number of participants	Number of interviews	Advisory committee	Oceans Working Group	Other <sup>c</sup>
Non-Mi'kmaq	DFO <sup>a</sup>	3	1	1	1	
	Community Organization	3	3	3		
	ENGO & Academia	5	5	5		
	Public <sup>c</sup>	2	2			2
Mi'kmaq	Mi'kmaq <sup>a,b</sup>	7	6	2	4	
Total		20	17	11	5	2

<sup>a</sup>Refers to an interview in which more than one participant was present.  
<sup>b</sup>Refers to participants who are Mi'kmaq and (or) work for Mi'kmaq organizations, regardless of identifying as Mi'kmaq.  
<sup>c</sup>Refers to participants who did not want to be identified within a participant group, was an observer, or participated in other working groups (e.g., Eastern Shore Fishermen's Protective Association Working Group).

We conducted 17 stakeholder and rightsholder (Mi'kmaq) semi-structured interviews with 20 participants (some individuals chose to interview as a group) between November 2019 and January 2020 (Table 1). All participants who were interviewed were knowledgeable of the ESI process and were either members of an advisory committee, working group, or consultations or an ESI advisory observer. Given the small pool of potential participants, demographic data are not provided to comply with anonymity requirements. Stakeholder refers to any individual or group who is involved in, affected by, or has current or future interests in the proposed MPA. Here, "stakeholder participants" refer to ESI Advisory Committee participant groups. Rightsholders are "actors who are socially endowed with legal or customary rights with respect to land, water, and natural resources" (Borrini-Feyerabend et al. 2013, p. 15) and refer to Mi'kmaq. Mi'kmaq participants include Mi'kmaq and non-Mi'kmaq individuals who work for Mi'kmaq organizations.

Given the focus of the study and time and resource limitations, participant recruitment involved purposive sampling and snowballing methodologies of those who were knowledgeable of or participated in the ESI MPA process. The targeted participants were either ESI advisory committee members, ESI working group members, Mi'kmaq-Crown consultation table members, and (or) advisory committee observers. The lead author recruited individuals by attending ESI Advisory Committee and Mi'kmaq-Crown consultations. Additionally, Kwilmu'kw Maw-klusuaqn Negotiation Office suggested Mi'kmaq individuals as potential participants. All participants had the opportunity to recommend additional individuals using snowballing techniques (Lewis-Beck et al. 2003). Interviews stopped when no additional candidates showed interest within the study time frame.

Interviews solicited information about the opportunity and challenge for Mi'kmaq values, knowledge, and interests to inform the Oceans Act MPA process (Appendix A). The lead author conducted in-person, over the phone, and virtual (e.g., Zoom) interviews that ranged from 30 to 120 minutes. Prior to the interview, a consent form that adhered to free, prior, and informed consent ethics principles (Supplementary Material C) and interview questions were provided to each participant. The questionnaire contained definitions on MEK, Mi'kmaq values (*Netukulimk* and *Msit no'kmaq*) and MPA governance to ensure a common understanding (Appendix A). The interview questions were provided ahead of time to address consideration of "informed consent" and to provide an opportunity for participants to reflect to improve response quality. Each interview was recorded and transcribed

manually. Transcriptions were sent back to the participant to review and respond to any clarification questions, reducing potential data misinterpretation (Mero-Jaffe 2011).

Interview data were analyzed using qualitative content analysis (Hsieh and Shannon 2005). The transcriptions were reviewed several times to manually identify codes (key words) reflecting core topics or ideas that informed sub-theme and theme development. The data analysis required contextual understanding to identify core themes. The themes reflected as many sub-themes as possible to ensure that participant views were comprehensively reflected in the results. To quantify the response consistently, the lead author developed a “coding rationale sheet” that explained what was included or not included in each category (Tables B1–B2, Appendix B). The response frequency was calculated according to the rationale sheet. The quantitative results were calculated based on the total number of interviews and not the number of total participants as there was consensus among individual participants within a group interview.

The criterion of participants’ level of knowledge/experience of the ESI MPA process resulted in a small sample size ( $n = 17$ ). Other factors limiting successful recruitment may be attributed to fisheries-related conflicts, MPA support, time, and lack of participant interest. While participants were recruited from a diversity of stakeholder groups, it is important to note that the perspectives obtained from the research cannot be inferred to represent the views of any stakeholder group. Despite the small sample size and given the small pool of potential participants, a sample size of 15–20 individuals is considered within the acceptable range for qualitative research (Guest et al. 2006; Palinkas et al. 2015). Every response within each theme and sub-theme is assumed to have equal weight. Several attempts to solicit participation from non-Indigenous fishers who were knowledgeable of the process were unsuccessful. This data gap was compensated for by accessing and reading minutes of public fisheries sector–DFO consultation meetings (DFO 2018a, 2021a) and through interviewee-fisher experiences. This augmented context helped in interpreting the results by providing additional insight on fisheries conflict and identifying fishers concerns and interests.

Results

Identified challenges in the current MPA process

Challenges were defined as any process, mechanism, activity, or pressure perceived to prevent (i) Mi’kmaq participation or (ii) Mi’kmaq knowledge, interests, and values from informing the MPA process. Based on content analysis, three major thematic challenges were identified: systemic barriers (42%), lack of understanding (21%), and fisheries conflicts (20%). Two additional themes, capacity and Mi’kmaq absence, also emerged as noteworthy but with a lower overall frequency (11% and 5%, respectively) (Table 2). Both Mi’kmaq and non-Mi’kmaq participants, primarily the

Table 2. Frequency of participant responses for challenges identified in the current marine protected area process.

Themes	Mi’kmaq	Non-Mi’kmaq				All participants
		Comm. Org.	DFO	ENGO & Academia	Public	
Systemic barriers	46%	7%	9%	33%	5%	42%
Lack of understanding	39%	23%	5%	21%	13%	21%
Fisheries conflicts	39%	17%	5%	22%	17%	20%
Capacity	46%	6%	6%	43%	0%	11%
Mi’kmaq absence	13%	33%	0%	47%	7%	5%

Environmental Non-Governmental Organization (ENGO) and Academia groupings, identified capacity limitations as a contributing factor preventing Mi'kmaq participation in MPA processes. These included consultation, engagement, data collection (science or MEK), and MPA management and decision-making (e.g., ability to lead MPA processes and co-govern). Mi'kmaq absence referred to the perceived Mi'kmaq absence in the advisory committee and the perceived Mi'kmaq community absence within the ESI AOI boundary. The presence of the small Mi'kmaq Sheet Harbour reserve was not acknowledged in the interviews. Two non-Mi'kmaq participants noted that the lack of an established Mi'kmaq community within or near the ESI AOI boundaries may have influenced the non-Mi'kmaq communities' acceptance and legitimacy of the Mi'kmaq as a primary decision-making authority in the MPA process.

Systemic barriers

Systemic barriers referred to the identified challenges pertaining to the organization of the governing system. These included federal governmental organization, structure, and procedures that were seen to impede Mi'kmaq participation. The five sub-themes included inadequate processes (42%), power imbalances (19%), legislation (15%), knowledge valuation (14%), and trust (11%) (Table 3).

Among the five sub-themes, inadequate processes was identified as the most prominent challenge (41%) with participants from the Mi'kmaq (38%) and ENGO and Academia groupings (36%) highlighting it most frequently (Table 3). Both non-Mi'kmaq and Mi'kmaq participants noted the current governance framework was fundamentally inadequate to support meaningful Mi'kmaq MPA participation. The governance structure was perceived to be highly fragmented and siloed with little communication between and within federal departments/agencies and regional offices. The frustration with the lack of departmental organization and coordination was reflected by a Mi'kmaq participant who observed the following:

*DFO is like a monster and it doesn't know its feet from its hands or its brain from its hands, there is so many moving parts—it doesn't know what this arm is doing and this leg doesn't know what this leg is doing, so at the end of the day it doesn't make any sense because [DFO departments and regions] don't talk to each other—a ton of branches for Aboriginal fisheries from Gulf to Maritimes. [DFO] are just so disorganized—[DFO] [doesn't] know what is going on in other regions ... (M1)*

The second most prominent sub-theme overall was power imbalances (19%) (Table 3). Participant comments centred around perceptions of DFO favouritism toward industry groups, particularly the fishing industry. Mi'kmaq participants perceived power imbalances between Mi'kmaq and local

Table 3. Frequency of participant responses for systemic barriers identified in the current marine protected area process.

Theme and sub-themes	Mi'kmaq	Non-Mi'kmaq				All participants
		Comm. Org.	DFO	ENGO & Academia	Public	
Systemic barriers	46%	7%	9%	33%	5%	42%
Inadequate processes	38%	4%	11%	36%	7%	41%
Power imbalances	68%	8%	0%	24%	0%	19%
Legislation	19%	10%	29%	38%	5%	15%
Knowledge valuation	36%	16%	5%	42%	0%	14%
Trust	86%	0%	0%	7%	7%	11%



fishers, and Mi'kmaq and DFO. Power imbalances between DFO and Mi'kmaq were viewed as a key contributing factor limiting Mi'kmaq ability to influence MPA decision-making. One Mi'kmaq participant expressed doubt about the conservation purpose behind the establishment of MPAs:

*... it's all about gains for themselves—making a good life for themselves—they [non-Indigenous fishers] don't care about the generations coming ... it's a conservation area for what they see fit—if there is a lucrative lobster region—they [DFO] will allow that fishery to continue—so they will cater to industry and always cater to the industry. (M1)*

Some non-Mi'kmaq participants in the ENGO and Academia and Community Organization groupings (24%) expressed similar perceptions of fishery favouritism. They noted the power imbalances within the ESI AOI process for those in non-fishery stakeholder groups who felt their voices were not being heard. However, non-Mi'kmaq participants rarely mentioned power imbalances between Mi'kmaq and the Canadian government as a challenge.

In terms of legislation as a barrier, participants felt that the current governance approach leaves little room for Indigenous peoples to assert their interests and obtain autonomy and agency. It was noted that DFO officials must work within their mandates and legislation, where the ultimate decision-making power rests with the Minister. As a DFO participant stated, the *Oceans Act* does not explicitly support any delegation of decision-making power or authority:

*... Oceans Act applies to everything we do ... and there is nowhere in the Act that says that the Minister can delegate to a First Nations or to Industry. (Cr6)*

There was also the mention of Ministerial discretion and the notion that the Minister can rescind any degree of negotiated power or decision at any time, thus undermining “true” power in decision-making by other parties. Additionally, Mi'kmaq participants noted limitations due to the jurisdictional scope of the *Oceans Act* whereby “drawing lines in the sand” between marine, coastal, and terrestrial landscapes do not reflect natural processes nor align with the Mi'kmaq worldview.

Importantly, with respect to knowledge valuation, a Mi'kmaq and a non-Mi'kmaq participant (Public grouping) expressed some concern about the scope of the MEK Study (MEKS). The MEKS was criticized for having a large focus on the historical and contemporary use of an area with limited information on cultural components and values. This limited scope and the lack of ability to share the MEKS content, even among Mi'kmaq communities, were viewed as limiting the MEKS's educational potential intergenerationally and publicly. As a Mi'kmaq participant noted:

*... we don't get to see everyone's reports [MEKS] —there seems to be a focus on traditional use and less so on values and what the cultural components are—a lot of geology, a lot of old, old history but nothing that really tells anybody about who we are? What we believe in? That is a big gap that we have—so the cultural content can be very limited. (M14)*

Lastly, all above sub-themes contributed to an understanding of the current level of trust as a significant systemic barrier (Table 3). Most Mi'kmaq participants (86%) flagged a demonstrated lack of trust within Mi'kmaq-DFO relations, between the Mi'kmaq and non-Mi'kmaq fishing industry, and even the trust of either science or MEK in informing decision-making.

## Lack of understanding

The lack of understanding of Mi'kmaq culture, knowledge, values, governance structure, and rights was noted as the second most prominent challenge to better enable Mi'kmaq values, knowledge,

Table 4. Frequency of participant responses for lack of understanding identified in the current marine protected area process.

Theme and sub-themes	Mi'kmaq	Non-Mi'kmaq				All participants
		Comm. Org.	DFO	ENGO & Academia	Public	
Lack of understanding	39%	22%	4%	21%	13%	21%
Mi'kmaq rights	25%	25%	5%	20%	25%	30%
Mi'kmaq culture, values, & knowledge	32%	26%	5%	21%	16%	28%
Differences in worldviews	58%	11%	5%	26%	0%	28%
Mi'kmaq governance structures	44%	33%	0%	11%	11%	13%

and interests to inform MPA governance. This theme included how differences of worldviews influenced Mi'kmaq participation. Mi'kmaq (39%), Community Organization (22%), and ENGO and Academia participants (21%) cited the lack of understanding most frequently. In comparison, based on the response frequency (4%), DFO participants did not perceive a lack of understanding as important. Mi'kmaq participants highlighted the differences in worldview more frequently than all other groups, whereas the understanding of Mi'kmaq rights was identified more evenly across all groups except for DFO participants (Table 4).

The lack of understanding of Mi'kmaq culture, values, and knowledge referred not only to the knowledge itself but to how Mi'kmaq knowledge and values were enacted and (or) applied. The most notable example was the lack of understanding of how Mi'kmaq values can play a role in influencing harvesting behaviours and practices, particularly by the fishing industry. The understanding of Mi'kmaq values was strongly interconnected with that of Mi'kmaq Treaty rights, particularly the right to a “moderate livelihood”, and how these rights are exercised. The perception of the Mi'kmaq right to fish by the Eastern Shore Fishermen’s Protective Association was shared by a participant from the Community Organization grouping:

... the Eastern Shore Fishermen’s Protective Association interpretation of that is, in pursuit of a moderate livelihood, we can fish being Mi'kmaq whenever we want, wherever we want and with how many traps we want and not bound by the DFO rules and regulations ... (C9)

While another participant from the Community Organization grouping recognized that Mi'kmaq had the right to fish, there was also the perception that by exercising those rights, the Mi'kmaq would potentially jeopardize the stock:

... [rights have been] deemed by the courts and [therefore] have got to be recognized but at the same time there has to be some kind of fairness too within the MPA—can’t have one group with rights potentially destroying the effectiveness of the MPA. (C12)

The quotes illustrate a lack of understanding of Mi'kmaq rights. The assumption that Mi'kmaq would continue to exploit the resource if there was a conservation concern indicated a lack of understanding of DFO’s authority to infringe on rights for the purpose of conservation and the Mi'kmaq principle of *Netukulimk*.

Fisheries conflicts

Fisheries conflicts as a theme emerged as a key challenge to Mi'kmaq participation (Table 5). Sub-themes included fisheries rights (42%) (e.g., conflicts between Mi'kmaq and non-Mi'kmaq fishers

Table 5. Frequency of participant responses for fisheries conflicts identified in the current marine protected area process.

Theme and sub-themes	Mi'kmaq	Non-Mi'kmaq				All participants
		Comm. Org.	DFO	ENGO & Academia	Public	
Fisheries conflicts	39%	17%	5%	22%	17%	20%
Fisheries rights	63%	7%	4%	11%	15%	42%
Fisheries access	9%	27%	5%	41%	18%	34%
Clarity of rights	40%	20%	7%	13%	20%	24%

and the potential for MPAs to impede fisheries access and infringe upon rights), fisheries access (34%) (e.g., inequitable distribution of costs and benefits, non-Mi'kmaq–Mi'kmaq non-rights–based fishery conflicts), and clarity of rights (24%) (e.g., lack of clarity surrounding a “moderate livelihood” or understanding of how rights are exercised). All participant groupings referred to fisheries conflicts to varying degrees. DFO highlighted fisheries conflicts the least across all sub-themes (5%). Mi'kmaq participants identified rights conflicts as the primary fisheries conflict (63%) and repeatedly highlighted the need to respect Mi'kmaq fishing rights and the importance to maintain MPA access. They noted that preventing access was disrespecting Mi'kmaq rights and therefore a rights infringement. This sentiment was expressed by one Mi'kmaq participant:

... Where the real consultations need to take place is [implementing the Marshall decision]—we are having issues with that [implementing Marshall] and I have issues with that because it undermines the process and our ability for Mi'kmaq to exercise our rights in certain areas—if [DFO] block them off, it is infringement ... (M1)

In addition, Mi'kmaq participants referenced “stream side conflicts” with non-Indigenous fishers as an ongoing issue but did not view fisheries access as a notable challenge. However, non-Indigenous fishers feared the MPA could potentially restrict their access, resulting in an unequal distribution of costs and benefits among non-Indigenous and Indigenous fishers and between communities. The concepts of “fairness” and “equity” were mentioned frequently in the interviews when speaking about fisheries conflicts.

Identified opportunities

Opportunities were defined as any process, mechanism, or activity that was perceived to either (i) improve Mi'kmaq participation or (ii) improve the ability for Mi'kmaq knowledge, values, and (or) interests to inform the MPA process and MPA governance. Two major opportunity themes and six sub-themes were identified. The first theme focused on opportunities that could be employed within the current state-led MPA process (55%), and the second theme focused on alternative governance approaches to the state-led MPA process (45%). Identified opportunities in the current MPA process and governance structure include Mi'kmaq consultation (54%), the adoption of Mi'kmaq concepts and approaches such as *Netukulimk* and *Etuaptmumk* (Two-Eyed Seeing) (24%), the MEKS (24%), and Mi'kmaq language incorporation (16%) (Table 6). Alternative approaches included co-governance and Indigenous-led approaches.

Identified opportunities in the current MPA process

Within the current MPA process and governance framework, both Mi'kmaq (65%) and DFO participants (20%) considered consultation tables as a valuable forum to create the space for deliberate dialogue and to foster learning, knowledge sharing, relationship-building, understanding, and trust

**Table 6.** Frequency of participant responses for potential opportunities to improve Mi'kmaq values, interests, and knowledge in marine protected area decision-making.

Theme and sub-themes	Mi'kmaq	Non-Mi'kmaq				All participants
		Comm. Org.	DFO	ENGO & Academia	Public	
<b>Current MPA process</b>						<b>55%</b>
Consultation	65%	6%	20%	6%	3%	54%
Mi'kmaq approaches & principles	43%	21%	21%	14%	0%	24%
MEKS	44%	11%	33%	0%	11%	16%
Mi'kmaq language	33%	0%	33%	33%	0%	5%
<b>Alternative governance approaches</b>						<b>45%</b>
Co-governance	53%	14%	7%	25%	0%	60%
Indigenous-led governance	26%	0%	5%	68%	0%	40%

(Table 2). Mi'kmaq participants emphasized the importance of meaningful consultation and the need to follow consultation protocols such as the Mi'kmaq-Canada-Nova Scotia Terms of Reference more often than other participant groups. Mi'kmaq participants further noted that the “duty to consult” requires Mi'kmaq-Crown consultations separate from stakeholder processes including multi-stakeholder advisory committees. Both Mi'kmaq and non-Mi'kmaq participants agreed that Mi'kmaq communities need to be consulted directly and that consultation should be driven by communities’ needs and interests.

The second highest identified opportunity (24%) was to encompass or adopt Mi'kmaq approaches and principles such as *Netukulimk*, *Msit no'kmaq*, and *Etuaptmumk*. Mi'kmaq (43%), Community Organization (21%), and DFO (21%) participants identified Mi'kmaq approaches and principles as tools to inform the MPA process, management, and governance (Table 6). Their adoption was viewed as an opportunity to reflect Mi'kmaq values and simultaneously improve conservation outcomes. A non-Indigenous Community Organization participant spoke about the importance of valuing Indigenous knowledge similarly to western science and adopting a Two-Eyed Seeing approach to better value knowledge and the benefits to conservation:

... I think [Indigenous knowledge and Two-Eyed Seeing] are critical when talking about conservation, I think [they provide a] fuller view of conservation and sustainability and a way of seeing the world that has to be incorporated. (C16)

The MEKS was identified as a public educational tool to illustrate areas of cultural significance by demonstrating the connections of people and place (Table 6). For example, sharing place-name information is reflected in the following DFO quote:

[The MEKS shows] how Mi'kmaq have been there for millennia and combines the lists of place-names ... [it is] an important piece to remind the public ... that the Mi'kmaq have been there, and this is an important area for them, [it] helps bring that information to the forefront and facilitate learning. (Cr6)

Similarly, Mi'kmaq, DFO, and ENGO and Academia participants identified Mi'kmaq language (5%) as another tool to highlight the Mi'kmaq people-place connection, albeit less frequently than the MEKS (16%) (Table 6). Participants suggested Mi'kmaq language and place-names could be woven

into management plans and signage and was an opportunity to take a more holistic approach and to facilitate Mi'kmaq participation in MPA governance. The following quote from a Mi'kmaq participant highlighted the importance of language and the interconnections between language and conceptualizing governance:

*... using Mi'kmaq language and in Mi'kmaq territory within agreements and within governance and conceptualizing governance is really, really critical ... because ... our ideas, our culture, our ways of being as individuals and societies is really encapsulated in our language but incorporating language into the ways that governance of an area ... can really change how people approach their role within that [governance]. (M15)*

## Alternative governance approaches

Participant responses highlighted the need to move away from a top-down, hierarchical governance approach to improve Mi'kmaq participation in MPA governance. The two key alternative governance approaches identified included co-governance (60%) and Indigenous-led governance (40%) (Table 6). In terms of co-governance, participant responses spoke to the need for MPAs to be co-developed, co-managed, co-governed MPAs or to an MPA process that required Mi'kmaq participation throughout. Indigenous-led processes included any statement that referenced an MPA establishment process that was Mi'kmaq or Indigenous driven, community-led, used a “bottom-up” approach, including explicit reference to Indigenous Protected and Conserved Areas (IPCAs).

Mi'kmaq participants repeatedly mentioned the need to co-develop, co-manage, and co-govern MPAs (53%). In contrast, DFO, Community Organization, and ENGO and Academia participants noted co-governance less frequently with 7%, 14%, and 25% response frequencies, respectively (Table 6). DFO participants acknowledged potential Mi'kmaq roles throughout the MPA process, including consultation, day-to-day management, and decision-making. When speaking about co-governance, both Mi'kmaq and DFO participants focused on the sharing of power between these two groupings. Mi'kmaq participants felt that Mi'kmaq are key decision-makers where MPA development is done in partnership with Mi'kmaq. Some Mi'kmaq participants suggested Mi'kmaq should have 51% of decision-making authority to ensure that DFO does not make decisions without their consent. In contrast, the ENGO and Academia and Community Organization participants emphasized the need for greater devolution of power to local communities, including Mi'kmaq and non-Mi'kmaq community members. The need for DFO to share power with stakeholders and rightsholders is illustrated by the following ENGO and Academia participant quote:

*Co-management or co-governance arrangement with community (particularly fish harvesters) and rightsholders ... [where] ... the stakeholders including the community, [the people who are going to be most impacted], and rightsholders, all need to be actively involved from the very beginning of the process, involved in decision-making, and management of the site once it gets established. (E11)*

Moving beyond co-governance, Mi'kmaq, DFO, and ENGO and Academia participants identified Indigenous-led MPAs as an opportunity to improve Mi'kmaq participation in MPA governance (Table 6). ENGO and Academia participants (68%) repeatedly mentioned the need to move toward Indigenous-led conservation approaches not only because “it is the right thing to do” but because it was noted as a key mechanism to reach conservation targets and protect biodiversity. Although all Mi'kmaq viewed Mi'kmaq as requiring an elevated decision-making role based on their constitutionally recognized rights, IPCAs were identified less frequently (26%) by Mi'kmaq participants when compared to all other opportunity categories.



## Discussion

### Importance of consultation

Enhancing the current consultation process emerged as the primary opportunity to facilitate the ability for Mi'kmaq values, interests, and knowledge to inform MPA decision-making. Consultation and engagement processes are part of how Indigenous peoples and stakeholders “have their say” within a governance system, thus these relationships are an integral part in effective governance. Eversole (2003) states “good governance depends upon participation and participation rests upon principles of power, motivation, legitimacy and trust” (as cited in Lee and Tran 2016, p. 85). Meaningful consultation forums provide the opportunity to facilitate relationship-building and understanding, which are critical for facilitating trust and legitimacy. Mi'kmaq participants emphasized the importance of following consultation protocols and ensuring Mi'kmaq are involved early and throughout the process. The call for improvement is consistent with previous reports and studies regarding inadequate consultations between DFO and Indigenous peoples of Canada (ANSMC and KMKNO 2018; Boyd and Lorefice 2018; Gray 2016). To many First Nations, meaningful consultation and engagement goes beyond the legal requirement of the “duty to consult” to “being a part of major decisions” (Boyd and Lorefice 2018, p. 584). This finding highlights improvements in the quality of the MPA decision-making process not only depend on facilitating Mi'kmaq input but are inextricably linked to the degree of receptivity and use of Indigenous knowledge and understanding of Mi'kmaq values and interests to inform decision-making (ANSMC and KMKNO 2018).

Participants also highlighted that consultation and engagement provide an opportunity for knowledge sharing, learning, and building relationships. In the Canadian Arctic, consultation and engagement forums through open dialogue provided an opportunity to facilitate knowledge sharing, social learning, mutual understanding, and relationship-building (Durand 2020). However, for the sharing of knowledge to occur and for mutual understanding to be achieved “all parties must be willing to engage and collaborate” (Smyth and Isherwood 2016, p. 321) and adequate resources must be available (Durand 2020). In the ESI MPA process, with separate consultation (Oceans Working Group) and engagement (Advisory Committee, Stakeholder Working Group) tables, little dialogue or information sharing occurred, impeding broader benefits of sharing knowledge such as learning and understanding. While the ‘duty to consult’ with Mi'kmaq requires a separate process from stakeholder engagement, the concerns of all affected groups, Mi'kmaq and non-Mi'kmaq, need to be shared to facilitate building relationships, mutual understanding, social learning, respect, and trust.

### Need for an alternative governance approach

The results indicate that the current mechanisms and governance structure are perceived to be inadequate for improving Indigenous participation in MPA governance. The emergence of shared governance and Indigenous-led approaches is consistent with Canada’s commitment to implement UNDRIP and provides an enhanced opportunity to restore Indigenous governance structures, revitalize Indigenous knowledge systems, reinvigorate community empowerment, and assert Indigenous rights (Rist et al. 2019; Smyth and Isherwood 2016; Tran et al. 2020a). For co-governed MPAs, success includes clear conflict resolution measures, recognition of Indigenous laws and authority by the state, negotiated agreements where Indigenous peoples have at least equal representation within the governing body, and supporting legislation (WCEL 2019). In Canada, the leading examples of co-governed MPAs exist in northern British Columbia (e.g., Gwaii Haanas, SGaan Kinghlas-Bowie Seamount MPA) and the Arctic (e.g., Tuallurtip Imanga National Marine Conservation Area (Tallurutip Imanga National Marine Conservation Area Inuit Impact and Benefit Agreement 2020), Tarium Nirtutait MPA (DFO and FJMC 2013), Ninginganiq National Wildlife Area) (WCEL 2017, 2019).

Currently, the *Oceans Act* does not include provisions to grant authority to Indigenous governing bodies nor are there formal mechanisms to support the establishment and recognition of IPCAs (Tran et al. 2020b). Both challenges were recognized by Mi'kmaq and non-Mi'kmaq participants in our study. The overarching authority of the Minister to rescind decisions can undermine the legitimacy of Indigenous peoples as partnered decision-makers even in co-management agreements. For example, the Minister overturned a decision by a co-governing body in British Columbia to temporarily close the herring fishery in 2014 due to concerns about stocks (von der Porten et al. 2016). Thus, there is a need for formal mechanisms or amendments to current legislation that improve the authority of co-governing or Indigenous governing bodies in MPA governance. While efforts to address this are underway as several pieces of Canadian legislation have undergone amendments in the last few years that have included Indigenous-related provisions (e.g., *Impact Assessment Act 2019*; *Fisheries Act 1985* [amended in 2019]), they are not without criticism and are consistent with those raised in our study (Claxton 2019; Eckert et al. 2020). Provisions that address similar concerns could be included in Canada's *Oceans Act* to provide a better legal foundation that support MPAs that respect Indigenous rights, knowledge, and laws and the creation of IPCAs.

In Australia, IPCAs have provided significant benefits to Aboriginal communities, including improving generational knowledge transfer, revitalizing language, reinvigorating the use of traditional practices, providing training and employment opportunities, and renewing community interest in caring for the land (Rist et al. 2019; Szabo and Smyth 2003). Our study suggests that Mi'kmaq participants were currently more supportive of pursuing co-governance opportunities than IPCAs. However, this may reflect a recognition of the need to enhance capacity and for Canada to develop the necessary policy environment to support IPCAs, rather than a long-term preference for co-governance. In a recent report on perspectives regarding terrestrial IPCAs, Mi'kmaq interviewed in Cape Breton, Nova Scotia, noted that IPCAs may provide opportunities for protecting Mi'kmaq rights, reform policies and legislation, and provide equitable benefits while meeting conservation commitments (UINR 2020). However, a lack of trust in the designation process was also noted, consistent with our findings. Given the potential benefits that may arise from implementing IPCAs, a better understanding of Mi'kmaq community interest, governance capacity, and the requisite supporting mechanisms is needed.

### Lack of understanding of Mi'kmaq culture, governance, and rights

Similar to our findings, a recent review of 70 submissions from Aboriginal organizations, industry representatives, and DFO officials on how to improve the DFO's consultation process cited concern among Indigenous communities for the lack of cultural awareness within federal organizations and the private sector (Gray 2016). The review also identified a need for better cultural awareness training and education on Indigenous rights and treaty rights. Misunderstandings focused on how Mi'kmaq Treaty rights are exercised (e.g., right to a moderate livelihood) coupled with a lack of understanding for the concept of *Netukulimk*. Non-Indigenous fishers expressed concern for conservation of the stock if Mi'kmaq fishers do not have to abide by the same regulatory regime as commercial fishers (Bundale 2020). The underlying assumption is that Mi'kmaq would continue to fish if the population is at risk. This assumption was repudiated in the following quote obtained in research conducted by Denny and Fanning (2016b) on Mi'kmaq practices over the harvesting of Atlantic salmon, an endangered species in Nova Scotia:

*For the Mi'kmaq, it is the initial quantity of salmon in the pool that determines whether or not salmon will be removed and, if present, how many. Only a certain number of salmon will be harvested from a pool and once fished, the pool will not be fished again that season. Fishers move from pool to pool, carefully selecting their catch and moving on to a new pool if more salmon are required. There is no set removal rate. There is an understanding that not all*

*salmon are to be removed from the pool, and only to remove what is needed.* (Denny and Fanning 2016b, p. 10)

The quote highlights the importance of sharing knowledge between Mi'kmaq and non-Mi'kmaq to improve understanding of Mi'kmaq practices guided by the principle of *Netukulimk*. Lack of awareness of Mi'kmaq governance structures, laws, and management protocols also foster the perception among non-Indigenous participants that if Mi'kmaq are not subject to imposed government regulations, they are not being governed by any regulation. Further, as our research showed, the lack of understanding of Indigenous rights contributed to fisheries conflicts, which have significantly influenced the MPA consultation and engagement process.

One identified mechanism to facilitate Mi'kmaq cultural understanding was the use of Mi'kmaq language in MPA management plans. Interview participants noted that language is an important part of conceptualizing governance. This is not a new or isolated observation and is seen as an important component in understanding and protecting Indigenous cultural integrity (Giles et al. 2016; GNWT 2005; TRC 2015). For example, to Indigenous communities in the Northwest Territories:

*... language ... create[s] a shared belief in and understanding of the world and our relationship to it: languages are about our—identity—who we are and how we understand and interact with each other and the world around us.* (GNWT 2005, p. 2)

Additionally, language can be used to teach younger generations and the public about Mi'kmaq culture. In Eskasoni, a Mi'kmaq community in Cape Breton, Nova Scotia, the importance of using the Mi'kmaq language to share knowledge on eel harvesting was deemed critical due to the unique connection of words to place and specific eeling practices (Giles et al. 2016). The use of Indigenous language as a naming convention for an MPA site is a means of recognizing Indigenous territories and connecting people to place, highlighting the cultural significance of a particular region (e.g., Gwaii Hannas “Islands of Beauty” in *Xaayda kil*, the language of the Haida People resident to Haida Gwaii, British Columbia).

## Need to create mechanisms valuing Mi'kmaq knowledge

Our results identified a need to develop formal mechanisms and cross-cultural approaches to improve the respectful contribution of Mi'kmaq knowledge and values in the MPA process. As DFO participants noted, it is the “*how*” that is one of the biggest struggles for Mi'kmaq knowledge and values to inform MPA governance. For example, the perception of many non-Indigenous scientists and government managers around Indigenous knowledge is that it can be used to educate and inform resource management decisions (Berkes et al. 2000; Menzies and Butler 2006). However, as noted by Latulippe (2015), this frame “can neglect the lived or active dimension of TK [Traditional Knowledge] and its interrelated ecological, socio-political, and spiritual dimensions” (p. 120). The opportunity for any context-specific MEK to meaningfully contribute to MPA governance first requires an acknowledgement that Indigenous knowledge cannot be extracted from its context and from the people that hold that knowledge (Whyte 2013). To facilitate this, Whyte (2013) suggests that a collaborative frame is needed “to continually learn from one another about how each approaches the very question of ‘knowledge’ in the first place, and how these different approaches can work together to better steward and manage the environment and natural resources” (p. 2). Through the interviews, two key potential mechanisms to facilitate an MPA governance approach that encompasses Mi'kmaq values and knowledge systems were identified. These mechanisms include adopting a Mi'kmaq approach (e.g., *Etuaptmumk* and *Netukulimk*).

An *Etuaptomuk* approach has been used in several resource management applications (Abu et al. 2019; Mantkya-Pringle et al. 2017), increasingly so within fisheries research and management (Giles et al. 2016; Reid et al. 2021). In Nova Scotia specifically, Mi'kmaq approaches and principles such as *Etuaptomuk* and *Netukulimk*, have successfully informed resource management plans, providing opportunities for knowledge co-production and social learning (Denny and Fanning 2016b; Popp et al. 2019). McMillian and Prosper (2016) argue that *Etuaptomuk* is “one of the most productive capacity building strategies in Atlantic Canada ... [and] ... provides a decolonizing approach for knowledge creation, mobilization and translation ... producing a common ground for co-existence and co-learning” (p. 640). Adopting a Two-Eyed Seeing approach will not be without challenges. There is still a lack of supporting evidence that this approach will lead to successful outcomes or truly lead to the equal valuation of knowledge systems in marine management (Reid et al. 2021), and there is still uncertainty on “how” to apply an *Etuaptomuk* approach in MPA management and governance. Additionally, there are several logistical (e.g., capacity, lack of formal processes), conceptual (e.g., differences in worldviews), and relation-based (e.g., mistrust) considerations and challenges that need to be addressed. Further research will be required for determining how best to apply *Etuaptomuk* and *Netukulimk* in MPA governance.

## Need for clarity of Mi'kmaq inherent and treaty rights

Conversations surrounding fisheries access have dominated the ESI AOI and Oceans Working Group for both Mi'kmaq and non-Mi'kmaq users. Even in other regions where there was limited fishery-MPA overlap, the opposition to potential restriction on fisheries access or impact on exercising fishing rights and privileges was strong (Guénette and Alder 2007). Additionally, how Mi'kmaq Treaty rights are exercised strongly suggests that fisheries conflict was not just about understanding the rights but also how the rights might impact access or livelihoods. It is no surprise that in the ESI region, where the local community is highly dependent on fisheries for their economic security (DFO 2019b), fisheries access dominated the discussion. Closely associated with access was the distribution of the fishery catch between Mi'kmaq and non-Mi'kmaq fishers. Previous studies have also found that the distribution of costs and benefits played a pivotal role in MPA success and was a key factor underpinning many conflicts associated with MPAs (Singleton 2009). The premise is that to obtain stakeholder support, there needs to be a perceived benefit increasing the willingness to participate and comply with MPA regulations (Dehens and Fanning 2018).

## Conclusion

This research aimed to identify potential mechanisms to facilitate a significant role for Mi'kmaq in MPA governance in a way that respects Indigenous knowledge, values, and rights. Several of our findings are important in improving Mi'kmaq participation in MPA governance. First, we reiterate the importance of consultation as an integral part of the process where Mi'kmaq can assert their rights and be involved in decision making. Second, we identified a need for an alternative approach to marine conservation as the current mechanisms and processes were perceived as inadequate for recognizing Indigenous rights. There was an interest in moving toward shared governance and Indigenous-led MPAs. However, more investigation is needed to identify appropriate structures, mechanisms, and implementation of co-governance and IPCAs in Nova Scotia. Third, we identified a considerable lack of understanding of Mi'kmaq culture and underlying worldviews that limit the ability of the Mi'kmaq to assert their rights in marine conservation. The lack of understanding undermines the consultation and engagement processes by impacting relationship-building and trust. These are integral to knowledge sharing and achieving the benefits that are acquired through deliberate, respectful dialogue. Fourth, we found an absence of mechanisms to facilitate knowledge sharing and Mi'kmaq concepts and values such as *Netukulimk*, *Msit no'kmaq*, and *Etuaptomuk* in a way that respected the knowledge holder and knowledge integrity. Lastly, we highlighted there is a need for

clarity around sovereignty and Indigenous rights, particularly Mi'kmaq Treaty rights due to the extent of existing fisheries conflicts in Nova Scotia. The inclusion of conflict resolution mechanisms and an analysis on the distribution of costs and benefits among local communities, fishers, and Mi'kmaq would help to reduce fisheries conflicts.

Our study highlights a critical and urgent need to address Indigenous rights and marine conservation concurrently. Finding ways to implement MPAs while respecting Indigenous rights do not have to be delayed while longer-term systemic changes occur. There are tools and means available to make tangible changes while other legal frameworks are being developed to ensure a better legal foundation for stronger Indigenous governance in MPAs. Identifying and developing mechanisms that both support local and Mi'kmaq communities and reduce fisheries conflicts should be integral components of marine conservation initiatives. Our research has highlighted enhanced social acceptance of Indigenous rights, culture, and knowledge through greater awareness and understanding, which can accelerate improved Mi'kmaq involvement in MPA decision-making.

## Relevant subject areas

Conservation and Sustainability, Science and Policy

## Competing interests

The authors have declared that no competing interests exist.

## Acknowledgements

The authors acknowledge the participation and support of Kwilmu'kw Maw-klusuaqn Negotiation Office and thank the interview participants for sharing their perspectives, knowledge, and experiences in the MPA process. Research funding was provided through the Canadian Healthy Oceans Network and its Partners: Department of Fisheries and Oceans Canada and INREST (representing the Port of Sept-Îles and City of Sept-Îles).

## Author contributions

MW and LF conceived and designed the study. MW performed the experiments/collected the data. MW analyzed and interpreted the data. MW, LF, and AM drafted or revised the manuscript.

## Data availability statement

All relevant information and data are within the paper, the Appendices, and (or) in the Supplementary Material.

## Supplementary material

The following Supplementary Material is available with the article through the journal website at doi:[10.1139/facets-2021-0128](https://doi.org/10.1139/facets-2021-0128).

Supplementary Material A

Supplementary Material B

Supplementary Material C



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## Appendix A

### Interview questions

#### Background information

##### **Mi'kmaq knowledge and resource governance concepts**

Mi'kmaq Ecological Knowledge (MEK) “includes the collection and adaptation of knowledge that Mi'kmaq people have with all components of the natural environment and the interrelationships that exist between all life forms from a unique historical, cultural and spiritual perspective” (KMKNO 2021). MEK encompasses the holistic worldview of the Mi'kmaq whereby people share a cultural and spiritual connection between all living things within their surrounding environment and understand the interconnections and interdependence of social-ecological systems (McMillan and Prosper 2016). Mi'kmaq have two concepts that demonstrate this connection and sustainable management of resources: *Msit no'kmaq* and *Netuklimk*.

*Msit no'kmaq* means “all my relations” (Denny and Fanning 2016). It is an epistemological concept whereby all living and non-living components within a social-ecological system are interconnected, all life and objects are considered as kin (Prosper et al. 2011).

*Netuklimk* is a concept that “guide[s] individual and collective beliefs and behaviors in resource protection, procurement, and management to ensure and honour sustainability and prosperity for the ancestor, and present and future generations” (Prosper et al. 2011, p. 1). Community members demonstrate this concept by giving thanks to the creator, prohibiting waste, and “taking only what you need” (Barsh 2002; McMillan and Prosper 2016).

These two concepts are ethical concepts that guide Mi'kmaq resource governance decisions.

**Governance:** “... the interactions among structures, processes, and traditions that determine direction, how power is exercised, and how the views of citizens or stakeholders are incorporated into decision-making” (Dearden et al. 2005, p. 89). MPA governance therefore includes the development and management of MPAs, and the consultation and decision-making processes within those.

#### **Research questions to respondents**

1. Can you briefly describe the current processes in place for the Eastern Shore Islands AOI for getting scientific, stakeholder, and Indigenous input?
  - a. Can you elaborate on the scientific advisory process? Participants? Time frame?
  - b. Can you elaborate on the stakeholder consultation process? Participants? Time frame?
  - c. Can you elaborate on the Nation-to-Nation process? Participants? Time frame?
2. Who do you think should be involved within MPA governance? (i.e., within the consultation and decision-making processes, in the development of MPAs, in the management of MPAs) (1)
3. What do you see as the role of Mi'kmaq within MPA governance? (i.e., within the consultation and decision-making processes, in the development of MPAs, in the management of MPAs) (1)
  - a. Are there opportunities or any interest for Mi'kmaq to initiate the MPA process?
4. What is the government's role/responsibility in including Mi'kmaq within MPA governance? (1)
5. What mechanisms do you see in place that facilitate the integration of Mi'kmaq values, interests, and knowledge within MPA governance? (3)

6. Do you think these mechanisms or processes are adequate? Why/why not? (3)
  - a. If not, how might it be improved? (3)
7. Where do you see opportunities to integrate Mi'kmaq values, interests, and knowledge within MPA governance, if any? (In general or using the context of ESI AOI) (2)
8. Do you see the value in integrating Mi'kmaq values, interests, and knowledge within MPA governance, if any? (In general or using the context of ESI AOI) (2)
9. What challenges or barriers do you see to integrating Mi'kmaq values, interests, and knowledge within MPA governance, if any? (In general or using the context of ESI AOI) (2)
10. Are there any other comments that you would like to make that were not covered in the previous questions?

Appendix B

Coding rationale sheet

Table B1 and Table B2 identify the coding rationale for each theme and sub-theme used when reviewing transcripts. Once general themes were identified, the transcripts were reviewed again to identify sub-themes. To quantify response frequency for each sub-theme, the reviewer noted what types of comments

Table B1. The “opportunity” theme and sub-themes coding rationale.

Opportunities within current governance
Consultation
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Spoke explicitly about Mi’kmaq consultation as an opportunity to improve Mi’kmaq participation, or the ability for Mi’kmaq principles and knowledge to inform the process</li><li>Emphasized the importance of Mi’kmaq consultation in order for MEK or principles to inform MPA processes</li><li>Mentioned Mi’kmaq TOR and (or) working group</li><li>Emphasized the importance of ongoing discussions and conversations with Mi’kmaq</li><li>Expressed frustration with the lack of Mi’kmaq consultation</li></ul>
MEKS
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Mentioned MEKS as an opportunity to gather information/gather knowledge, a learning tool, or tool to facilitate mutual understanding</li></ul>
Language
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>The importance of language in facilitating learning and understanding either Mi’kmaq or generally</li></ul>
Mi’kmaq concepts/approaches
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Netukulimk as a tool in MPA governance and (or) MPA process to facilitate the ability for values, knowledge, and interests to inform MPAs</li><li>Two-Eyed Seeing approach to facilitate the ability for values, knowledge, and interests to inform MPAs</li><li>Any other reference to a Mi’kmaq approach, principle, or concept</li></ul>
Alternative governance
Co-governance
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Co-governance, co-management, community-based process with Mi’kmaq</li><li>That Mi’kmaq should be involved throughout the process including management and decision-making</li><li>Co-developed MPA process with Mi’kmaq</li></ul>
Indigenous-led
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Mi’kmaq-/Indigenous-driven/led process</li><li>Mi’kmaq/Indigenous community-based/bottom-up approach</li><li>Indigenous protected and conserved areas</li></ul>
Other
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"><li>Any suggested alternative approach to the current top-down process (e.g., Marine Spatial Planning, Integrated Coastal and Ocean Management, Marine Environmental Quality)</li></ul>

**Table B2.** The “challenges” theme and sub-themes coding rationale.

<b>Challenges within the current governance system</b>
<b>Systemic barrier</b>
<b>Crown governance structure</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Top-down governance structure issues</li> <li>• Department structural issues (e.g., siloing departments)</li> </ul>
<b>MPA process inadequacies</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Explicit indication or comment related to inefficiencies or barriers with the process itself</li> <li>• Issues related to how MEKS informs the MPA process and what information is provided within the MEKS</li> <li>• Lack of communication between tables (e.g., negotiation tables, MPA advisory, and other working groups)</li> <li>• Inherent bureaucratic challenges (e.g., decision-making time, governmental language)</li> <li>• MPA process is fragmented</li> <li>• Inadequate consultation processes (Mi'kmaq-DFO)</li> <li>• Lack of formal mechanisms (any indicator or comment that pertains to having a formal process that impeded the ability for Mi'kmaq to fully participate within the process) (e.g., dispute resolution processes, formal process for MEK to inform MPAs alongside science)</li> </ul>
<b>Legislation</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Legislation or legislation components that do not allow for or facilitate co-management, the creation of IPCAs, or do not align with Mi'kmaq worldview (e.g., land-coastal-marine interconnections)</li> <li>• Ministerial discretion</li> <li>• Mention of the inability to devolve power</li> </ul>
<b>Indigenous knowledge valuation</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Explicit or implicit mention of knowledge undervaluation</li> <li>• Expressed frustration with knowledge undervaluation</li> <li>• The undervaluation of cultural values and (or) overvaluation of ecological values and biological indicators</li> </ul>
<b>Power imbalances</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Catering to industry or prioritization of industry or stakeholder groups</li> <li>• “Loudest voices being heard”</li> <li>• Conflicts between conservation and industry</li> <li>• Power imbalances between government and Indigenous peoples</li> </ul>
<b>Trust</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Trust between Mi'kmaq community, Mi'kmaq-DFO, Mi'kmaq-fishers, Mi'kmaq and science (Note: did not include participant comments related to mistrust between community-DFO or fisheries-DFO)</li> </ul>
<b>Fisheries conflicts</b>
<b>Fisheries access</b>
Statements/comments were counted each time participants referred to the following elements:
<ul style="list-style-type: none"> <li>• Fear of fisheries access loss (contributes to overall fisheries conflicts between Mi'kmaq and non-Mi'kmaq fishers)</li> <li>• MPA impeding fisheries access, which can undermine the process</li> <li>• Issues surrounding fairness and equity or equitable distribution of resource access</li> </ul>

*(continued)*



Table B2. (concluded)

### Mi'kmaq rights

Statements/comments were counted each time participants referred to the following elements:

- Conflicts between non-Mi'kmaq fishers and Mi'kmaq fishers or rights-based fishery conflicts
- Lack of respect for Mi'kmaq rights
- The need to respect Mi'kmaq rights within the MPA process

### Clarity/understanding rights

Statements/comments were counted each time participants referred to the following elements:

- Lack of understanding of how fishing rights are exercised and is related to fisheries conflicts
- Lack of clarity on how “moderate livelihood” is defined and how that contributes to the fisheries conflicts

### Lack of understanding

#### Mi'kmaq culture/values/knowledge/governance

Statements/comments were counted each time participants referred to the following elements:

- That illustrate a lack of understanding of Mi'kmaq culture, values, and knowledge (e.g., assuming Mi'kmaq will overharvest the stock)
- That illustrate or imply a lack of understanding how Mi'kmaq harvest or conduct cultural practices or use the resources (e.g., assumption that when there is no Mi'kmaq community presence that Mi'kmaq do not use the area)
- Direct statements that there is a lack of understanding

#### Mi'kmaq governance structure

Statements/comments were counted each time participants referred to the following elements:

- A misunderstanding of how Mi'kmaq fisheries decisions are made (e.g., not a “free for all” and there are rules that Mi'kmaq individuals abide by as part of their won governance systems and laws”)
- Mi'kmaq governance structure

#### Mi'kmaq rights

Statements/comments were counted each time participants referred to the following elements:

- Direct or indirect statements that illustrated a lack of understanding of rights (e.g., free, prior, and informed consent as veto power)
- Perceived Mi'kmaq as having “special treatment” versus being seen as rightsholders
- Perceived Mi'kmaq as stakeholders versus rightsholders

#### Differences of worldviews

Statements/comments were counted each time participants referred to the following elements:

- Direct statements about worldview differences
- Language used when speaking of resources from a utilitarian perspective
- Difficulties with comparing or integrating western and Indigenous knowledge systems

#### Mi'kmaq presence at advisory

Statements/comments were counted each time participants referred to the following elements:

- Lack of Mi'kmaq presence at the advisory table or an unawareness of Mi'kmaq representatives at the advisory table

#### Capacity

#### Funding/support

Statements/comments were counted each time participants referred to the following elements:

- Explicit reference to funding
- Lack of capacity assumed to be funding

#### Personnel

Statements/comments were counted each time participants referred to the following elements:

- Lack of personnel to be involved in the process (e.g., consultation process, gathering information, manage MPAs, govern MPAs)
- Lack of technical expertise to fully participate

were included under each sub-theme to ensure that similar comments were counted in the same category for each interview. Each time additional criteria were added in any sub-theme, transcripts were re-reviewed to ensure that the response frequency remained consistent. The transcript reviewer counted how many times an idea or phrase, not individual words, was brought up that fitted into each category.