

**Fisheries  
and Oceans  
Canada  
Maritimes  
Region**



FIRST-GENERATION

# Marine Spatial Plan

Scotian Shelf and Bay of Fundy  
2024



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# Acronyms

<b>ACOA</b>	Atlantic Canada Opportunities Agency
<b>ACT</b>	Atlantic Coordination Table
<b>ADA</b>	Aquaculture Development Area
<b>AMP</b>	Aquaculture Management Program
<b>AOI</b>	Area of Interest
<b>BES</b>	Blue Economy Strategy
<b>CAN-EWLAT</b>	Canadian Extreme Water Level Adaptation Tool
<b>CCG</b>	Canadian Coast Guard
<b>CCVE</b>	Climate Change Vulnerability Evaluation
<b>CEPI</b>	Collaborative Environmental Planning Initiative
<b>CFRN</b>	Canadian Fisheries Research Network
<b>CIM</b>	Cumulative Impact Mapping
<b>CIOOS</b>	Canadian Integrated Ocean Observing System
<b>CIVI</b>	Coastal Infrastructure Vulnerability Index
<b>CMAR</b>	Centre for Marine Applied Research
<b>CNSOER</b>	Canada-Nova Scotia Offshore Energy Regulator
<b>CNSOPB</b>	Canada-Nova Scotia Offshore Petroleum Board
<b>CSAS</b>	Canadian Science Advisory Secretariat
<b>CWS</b>	Canadian Wildlife Service
<b>CWTDB</b>	Canadian Wind Turbine Database
<b>DFO</b>	Fisheries and Oceans Canada
<b>EAM</b>	Ecosystem Approach to Management
<b>EBM</b>	Ecosystem-Based Management
<b>EBSA</b>	Ecologically and Biologically Significant Area
<b>ECCC</b>	Environment and Climate Change Canada
<b>ENGO</b>	Environmental Non-Governmental Organization
<b>ESA</b>	Ecologically Significant Area
<b>FGP</b>	Federal Geospatial Platform
<b>FSC</b>	Food, Social, and Ceremonial
<b>G&amp;C</b>	Grants and Contributions
<b>GIS</b>	Geographic Information System
<b>IAAC</b>	Impact Assessment Agency of Canada
<b>IOM</b>	Integrated Oceans Management
<b>IPCA</b>	Indigenous Protected and Conservation Areas

<b>KMKNO</b>	Kwilmu'kw Maw-klusuaqn
<b>MAPC</b>	Maritimes Aboriginal Peoples Council
<b>CMM-MCG</b>	Confederacy of Mainland Mi'kmaq – Mi'kmaq Conservation Group
<b>MGMSF</b>	Marine Geoscience for Marine Spatial Planning
<b>MEQ</b>	Marine Environmental Quality
<b>MPA</b>	Marine Protected Area
<b>MPC</b>	Marine Planning and Conservation
<b>MSC</b>	Marine Stewardship Council
<b>MSDI</b>	Marine Spatial Data Infrastructure
<b>MSP</b>	Marine Spatial Planning
<b>MTI</b>	Migmawe'I Tplu'taqnn Incorporated
<b>NBAPC</b>	New Brunswick Aboriginal Peoples Council
<b>NCNS</b>	Native Council of Nova Scotia
<b>NHQ</b>	National Headquarters
<b>NMCA</b>	National Marine Conservation Area
<b>NRCan</b>	Natural Resources Canada
<b>NSDFA</b>	Nova Scotia Department of Fisheries and Aquaculture
<b>OECM</b>	Other Effective area-based Conservation Measure
<b>ORE</b>	Offshore Renewable Energy
<b>ORER</b>	Offshore Renewable Energy Regulations
<b>OPP</b>	Oceans Protection Plan
<b>OUCA</b>	Ocean Use Compatibility Analysis
<b>OWE</b>	Offshore Wind Energy
<b>PCA</b>	Parks Canada Agency
<b>RRA</b>	Rights Reconciliation Agreements
<b>SAR</b>	Species at Risk
<b>SDM</b>	Species Distribution Model
<b>SEACAT</b>	Strategic Ecosystem/Activity Compatibility Assessment Tool
<b>TC</b>	Transport Canada
<b>TRC</b>	Truth and Reconciliation Commission of Canada
<b>UINR</b>	Unama'ki Institute of Natural Resources
<b>UNDRIP</b>	United Nations Declaration on the Rights of Indigenous Peoples
<b>UNESCO</b>	United Nations Educational, Scientific, and Cultural Organization
<b>WNNB</b>	Wolastoquey Nation of New Brunswick



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# 1

## Introduction

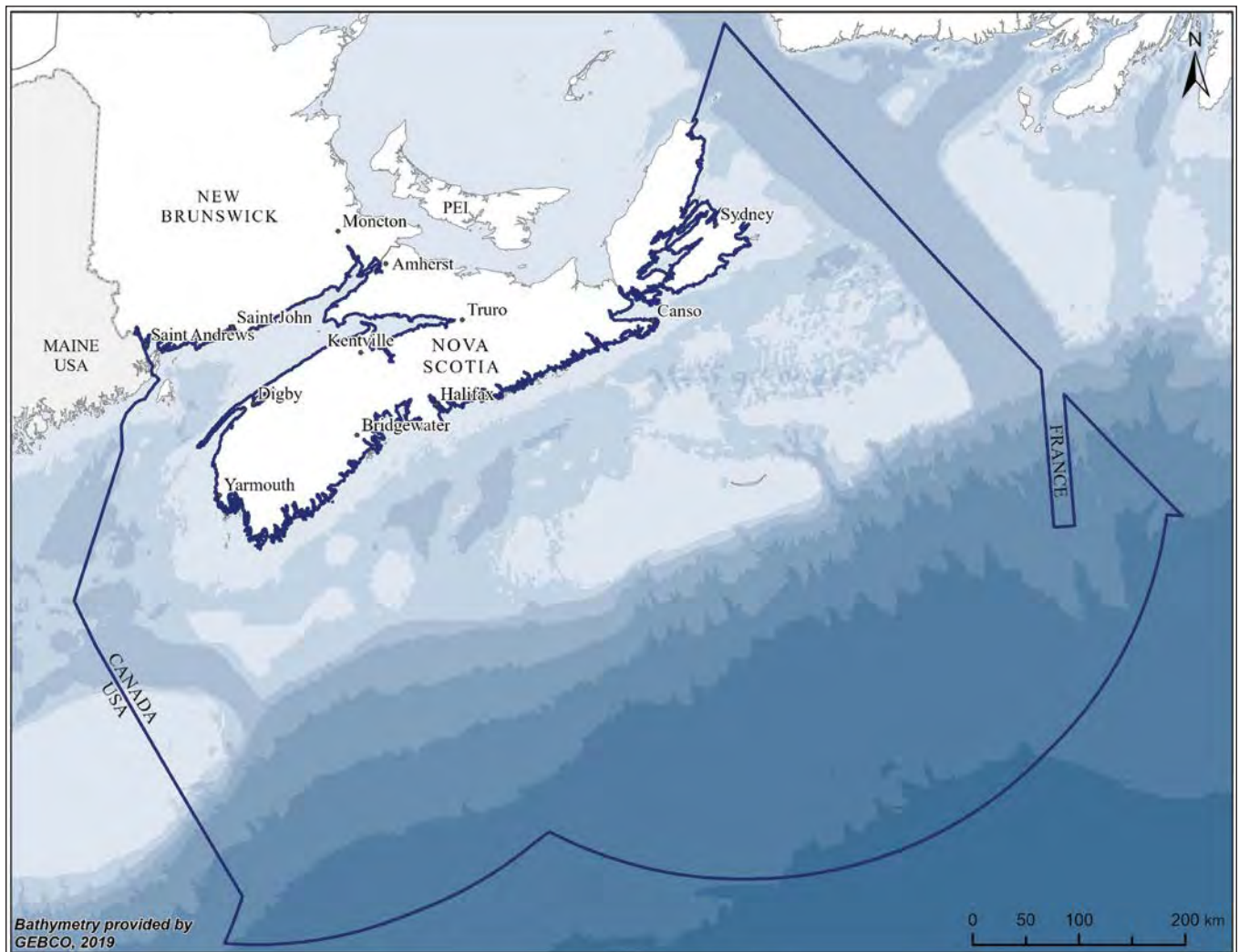
### 1.1 Purpose

The purpose of this document is to describe the approach that is being taken to help advance marine spatial planning (MSP) in the Maritimes Region of Fisheries and Oceans Canada (DFO), which is also known as the Scotian Shelf and Bay of Fundy planning area. This area includes the Bay of Fundy, the Atlantic Coast, and the offshore Scotian Shelf as shown in [Figure 1](#). DFO has been given the authority under Canada's *Oceans Act* to advance marine planning in Canada on behalf of the federal government.

As prepared by DFO, this document reflects international guidance for advancing MSP programs and the initial interests and involvement of a range of Indigenous organizations, government departments, and stakeholders. The approach taken for advancing MSP in this document reflects

the lessons learned and the evolution of the ocean and coastal management work within the Maritimes Region over the past 20 years. It is acknowledged that the planning area for this work corresponds to the ancestral and unceded territories of the Mi'kmaq, Wolastoqey and Peskotomuhkati peoples.

In Canada, marine spatial planning is still in its early stages as a tool to implement integrated oceans and coastal management. While this is largely a DFO document now, it is hoped that others will see their interests reflected in it and the benefits of the approach being taken. It is further hoped that shared ownership will develop over time. Ongoing participation and input from the diverse range of marine stakeholders and rights holders will strengthen this work going forward and ensure that a range of social, cultural, economic, and ecological interests can be supported.



**FIGURE 1** Planning area boundaries for the Scotian Shelf and Bay of Fundy Marine Spatial Plan.

This Plan is meant to guide, and not replace, the current sector-by-sector planning and management that takes place within the marine environment by a wide variety of government departments. There are no regulatory powers associated with this Plan. Instead, the Plan is more strategic in nature and aims to add value to existing planning and decision-making processes through the provision of timely and accessible information, spatial analysis, decision-support tools, governance arrangements, collaboration, communications, and capacity support. A concerted effort has been made to focus on the practical benefits of MSP which can include supporting economic opportunities, reducing conflicts with siting new activities, making better decisions, improving awareness and understanding of oceans issues, valuing and including different perspectives and knowledge systems, and planning at local to regional scales.

This document includes background information on the key goals, objectives and priorities this work will advance. Information on the ecological, social and economic context of the Maritimes Region, governance arrangements, linkages with other key marine initiatives, and early feedback is included. Initial tools for improving planning and decision making are described, including Canada's new online Marine Planning Atlas. Tangible outcomes will be outlined and reported in future efforts to help address the priorities identified.

This document is considered a first-generation Marine Spatial Plan for the Region and a starting point. As such it will evolve over time as efforts continue. This work will be revisited and revised as needed based on input from our partners.





## 1.2 Vision

Healthy marine and coastal ecosystems and sustainable communities are supported through effective participation, management, and decision-making processes.

### Definition of MSP

Marine spatial planning has been defined in different ways across the globe, often reflecting the elements which support or constrain its adoption. For this current Plan, MSP is defined as:

*“a process for supporting the management of ocean spaces that considers a range of ecological, economic, cultural, and social objectives”*

### Collaboration on the Maritimes Region’s first-generation Marine Spatial Plan

The development of this Plan has been led by DFO Maritimes Region based on collaboration, input and the priorities identified by key participants to date. The Plan reflects the interests gathered through initial engagement within DFO and with other federal departments, the Provincial Governments of Nova Scotia and New Brunswick, and Indigenous communities. DFO Maritimes Region recognizes that the priorities and interests of these groups may change over time as we continue to engage. Reaching a degree of shared understanding and interest from these organizations, given their legislative authorities and rights, was considered a necessity to assess their interest to proceed with MSP. While engagement of these groups has been a priority, DFO acknowledges some of the challenges of their participation, including varying capacity and time availability, as well as the workplace disruptions caused by the global COVID-19 pandemic, and will continue to work with them to include their input. Across the groups that were engaged to develop the first-generation Plan, there was general interest in continuing to advance MSP. The MSP process will continue to evolve as engagement continues.

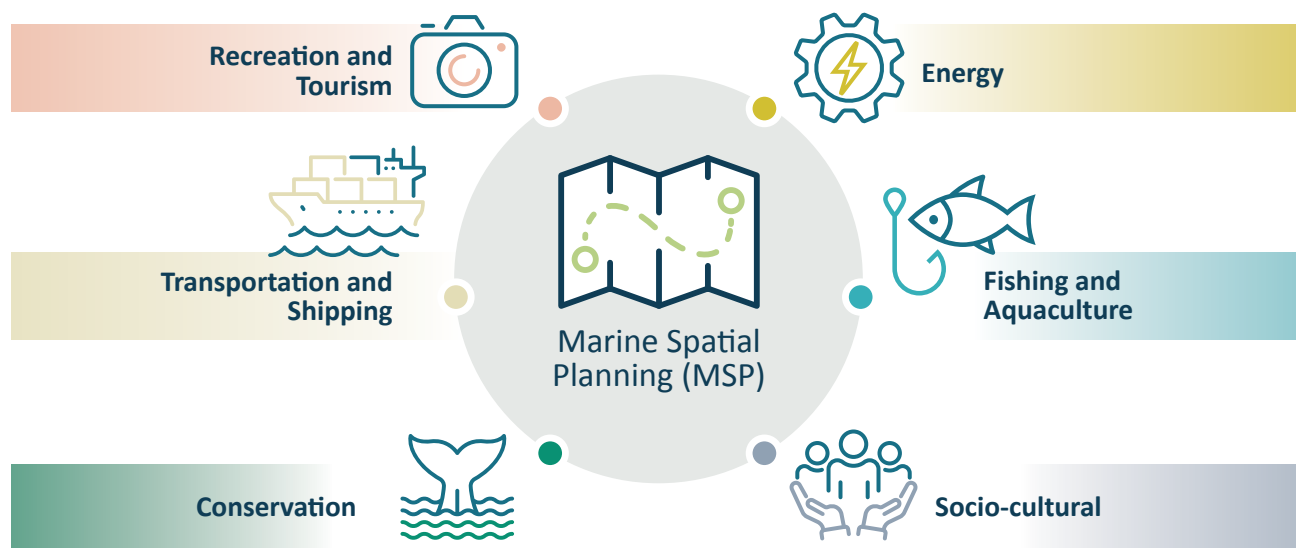
Work has also begun to better understand and reflect the priorities of other important users of the marine environment including the fishing sector, municipal governments and coastal communities, offshore energy developers, ENGOs and others. This work is ongoing and will continue to be reflected in the shared priorities and work plans of the MSP Program over time.



## 1. Introduction

The MSP process strives to build on previous work and bring together government regulators, Indigenous groups, stakeholders, and communities. Marine spatial plans are tailored to each unique planning area to help manage human activities and their impacts on Canada's oceans. Internationally, MSP is recognized as an effective tool for

transparent, inclusive, and sustainable ocean planning and management with many countries using this approach to manage their ocean space. Various sectors can be involved in the MSP process, including but not limited to recreation and tourism, transportation and shipping, conservation, socio-cultural uses, fishing and aquaculture, and energy (Figure 2).



**FIGURE 2** The marine spatial planning process and connections to associated sectoral activities.

## 1.3 Drivers

Our ocean and coastal waters are increasingly crowded places where activities such as fishing, shipping, oil and gas development, cultural and spiritual activities, recreation and tourism, submarine cables, aquaculture, nature conservation, renewable energy developments, and others share space. These activities have the potential to conflict with each other in space and time and to impact the marine environment. Marine spatial planning is an attempt to better understand and consider these activities together to minimize conflicts and meet common goals.

Under the *Oceans Act* (1996), DFO has the authority to lead the development of integrated management plans in collaboration with other government

departments and agencies, provincial and territorial governments, Indigenous authorities, and other stakeholders for all activities or measures in or affecting Canada's estuarine, coastal, and marine waters. MSP is an approach to fulfill this role. MSP also advances commitments made under the Convention on Biological Diversity and the recent Global Biodiversity Framework Target 1 that calls for areas to be under inclusive spatial planning.

MSP is also a tool for DFO to meet commitments for marine conservation. The 2021 Mandate Letter calls for the Minister of Fisheries, Oceans and the Canadian Coast Guard to ensure Canada meets its goals to conserve 25 percent of its oceans by 2025 and 30 percent by 2030 (see Annex A for more information on conservation).

## 1.4 Principles

The Marine Spatial Plan will support applying the following principles and concepts to the work being undertaken. Several important Mi'kmaq principles and definitions are described below, and other Indigenous principles will be sought through ongoing engagement.

- **Reconciliation:** Reconciliation with Indigenous peoples is a commitment of the Government of Canada based on the recognition of rights, respect, co-operation, and partnership. Opportunities to advance reconciliation through the MSP Program will be pursued, including strengthening relationships with Indigenous organizations, and incorporating their interests. The planning area for this work corresponds to the ancestral and unceded territories of the Mi'kmaq, Wolastoqey and Peskotomuhkati peoples.
- **Sustainable development:** Sustainable development is the economic development of resources that meets the needs of the present generation without compromising the ability of future generations to meet their needs.
- **Adaptability:** Adaptive management recognizes that conditions are continually changing, and management practices must be flexible to respond to these changes.
- **Ecosystem-based:** Ensures that ecosystem sustainability and function is of primary importance in MSP processes and that human activities and environmental stewardship are considered in a multi-use context.
- **Area-based:** Area-based (or spatial) management is an approach that applies management measures (i.e., regulatory tools) to a specific geographic area to achieve a desired policy outcome or planning objective.
- **Evidence-based:** Ensures that processes are informed by the best available information from diverse scientific disciplines and knowledge bases, including that from partners and stakeholders as appropriate.
- **Participatory:** A participatory approach is used to engage and involve Indigenous communities and organizations, federal, provincial, and municipal levels of government, marine and coastal sectors, and the broader public in the marine spatial planning process.

### Shouldn't MSP include a zoning plan?

The current first-generation Marine Spatial Plan is not a multi-use zoning plan for the Maritimes Region which allocates all marine uses to specific areas and times. As described in [chapter 2](#) (Legislative context), while DFO is the lead for advancing MSP under the Oceans Act, it does not currently have the legislative authority to develop a plan that regulates all users in such a manner. Other legislation as administered by a wide range of government departments continues to apply to managing these marine uses including if, where, when, and how they take place. In addition, even if the legislative authority were in place to pursue this form of MSP, considerable time, collaboration and willingness by all parties would be required to reach agreement on such an overall allocation of space within the Maritimes Region. As a result, DFO has not pursued a multi-use zoning scheme as part of this first-generation Plan.

The first-generation Plan focuses on the development of other foundational improvements possible in marine management under MSP. These include enhanced decision-making based on accessible and timely information, mapping and other decision-support tools, effective governance arrangements, and capacity enhancement for partners that will together improve how the oceans are managed at both local and regional scales. A multi-use zoning scheme could be pursued in the future if the legislative requirements are in place and if deemed desirable by those sharing the marine space in the Maritimes Region.

## 1.5 Reconciliation

In 2016, Canada fully endorsed and committed to implementing the *United Nations Declaration on the Rights of Indigenous Peoples* (UNDRIP). On June 21, 2021, the *United Nations Declaration on the Rights of Indigenous Peoples Act* came into force, providing a roadmap for the Government of Canada and First Nations, Inuit, and Metis peoples to work together to implement UNDRIP based on reconciliation, healing and cooperative relations. The Act affirms UNDRIP as an international human rights instrument that can help interpret and apply Canadian law. This commitment, by the Government's own admission, requires transform-ative change in the Government's relationship with Indigenous Peoples.

The Truth and Reconciliation Commission of Canada (TRC) defines reconciliation as "establishing and maintaining a mutually respectful relationship between Aboriginal and non-Aboriginal peoples in this country where there is an awareness of the past, an acknowledgement of the harm that has been inflicted, atonement for the causes, and action to change behavior," (Truth and Reconciliation of Canada 2015). The Government of Canada's approach to reconciliation is guided by UNDRIP, the TRC's Calls to Action, constitutional values, and collaboration with Indigenous peoples. Reconciliation is a fundamental purpose of Section 35 of the *Constitution Act* (1982), which recognizes and affirms the Aboriginal and treaty rights of Indigenous peoples in Canada. The National Centre for Truth and Reconciliation continues the work started by the TRC through providing stewardship of records and by promoting continued research and learning.

In the 2021 Mandate Letter, the Prime Minister directed the Minister of Fisheries, Oceans, and the Canadian Coast Guard to build upon the progress that has been made with First Nations, Inuit, and Métis peoples, including supporting self-determination and advancing reconciliation. The Minister is also directed to use good scientific evidence, local perspectives, and Indigenous Knowledge while working towards ambitious conservation targets. Direction was also received to work with Indigenous partners to integrate traditional knowledge into planning and policy decisions.

### Key Mi'kmaw principles and definitions

*Text prepared by the Kwilmu'kw Maw-Klusuaqn for the St. Anns Bank MPA Management Plan (DFO 2023a)*

**Netukulimk** is the use of the natural bounty provided by the Creator for the self-support and well-being of the individual and the community. Netukulimk is achieving standards of community nutrition and economic well-being without jeopardizing the integrity, diversity, or productivity of our environment.

**Etuptumuk** or Two-Eyed seeing is a balanced respect, appreciation, and consideration for Indigenous and Western knowledge. It is learning to see from one eye with the strengths of Indigenous knowledge and ways of knowing, and from the other eye with the strengths of Western knowledge and ways of knowing and learning to use both eyes together for the benefit of all. In practicality, Two-Eyed Seeing is about co-learning, co-production of knowledge, and implies collaboration between different knowledge systems. The language spoken throughout Mi'kma'ki has the phrase *Msit no'kmaq*; translated, it means 'all my relations'. It describes the Mi'kmaw relationship with the natural world, the living and non-living, in the temporal scales of past, present, and future.

**Sespite'tmnej:** To 'look after something in a meaningful way'

**Toq'maliaptmu'k:** "We will look after it together"

**Msit no'kmaq:** "All my relations" — all things are inter-related, and we must honour and respect all life as our kin.



### **United Nations Declaration on the Rights of Indigenous People (UNDRIP)**

*UNDRIP Article 31 – “Indigenous peoples have the right to maintain, control, protect and develop their cultural heritage, traditional knowledge and traditional cultural expressions, as well as the manifestations of their sciences, technologies and cultures [technologies such as tools / artefacts], including human and genetic resources, seeds, medicines, knowledge of the properties of fauna and flora, oral traditions, literatures, designs, sports and traditional games and visual and performing arts. They also have the right to maintain, control, protect and develop their intellectual property over such cultural heritage, traditional knowledge, and traditional cultural expressions.”*

In accordance with the Government of Canada’s mandate, staff from DFO and the Canadian Coast Guard (CCG) are responsible for prioritizing and advancing reconciliation through various ocean programs and initiatives.<sup>1</sup> How DFO employees will work towards reconciliation is outlined in a [DFO-Coast Guard Reconciliation Strategy](#) (Government of Canada 2019b). The Strategy is a whole-of-Department long-term guidance document which includes a commitment to recognizing and implementing Aboriginal and treaty rights related to fisheries, oceans, aquatic habitat, and marine waterways through action areas, guiding principles, and Departmental indicators. The long-term objectives of the Strategy are: a strengthened Indigenous-Crown relationship, recognized self-determination and reduced socio-economic gaps.

Using the DFO-CCG Reconciliation Strategy and internal guidance provided through a Regional Reconciliation Action Plan, MSP managers in the Maritimes Region will work to advance reconciliation, while recognizing that reconciliation is an ongoing process that occurs in the context of changing Indigenous-Crown relationships.

Indigenous Knowledge and perspectives can be used to inform all aspects of the Plan. Indigenous Knowledge will also be sought within the MSP process on a project-specific basis and will be used with the expressed permission of the groups providing it. Collaborative arrangements (e.g., Grants and Contribution Agreements) have and will continue to be created with Indigenous organizations to enhance their capacity to engage with their own community members and DFO. These agreements will allow for staffing, time, and resources to be directed towards effective participation. Lastly, collaborative agreements will strengthen the relationship between DFO and Indigenous organizations through ongoing dialogue and the identification of priorities so that the MSP Program can better support these areas.

## **1.6 Timelines and revisions**

This first-generation Maritimes Region Marine Spatial Plan describes the current status of MSP in the Scotian Shelf and Bay of Fundy planning area. Feedback to shape this Plan has been gathered from various organizations through a formal engagement process over the latter half of 2023, as well as from previous engagements, meetings, discussions, and the MSP Contribution Agreements in place. A summary of the feedback provided is described in [chapter 6](#). This approach will be revisited every 3 years and will be revised as needed.

1 Mandate Letter of the Minister of Fisheries, Oceans, and the Canadian Coast Guard. 2021. Available from: <https://www.pm.gc.ca/en/mandate-letters/2021/12/16/minister-fisheries-oceans-and-canadian-coast-guard-mandate-letter>

# 2

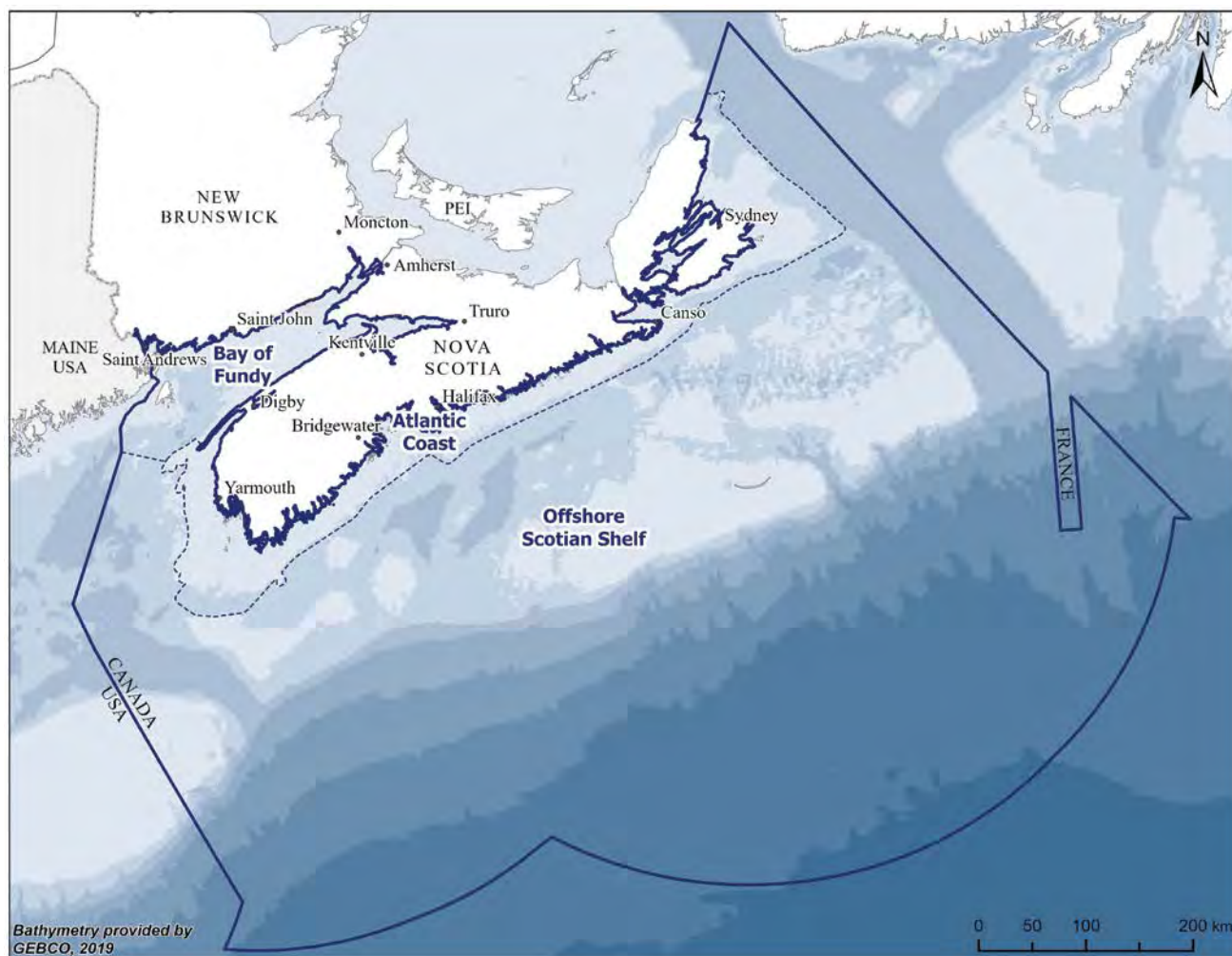
## Planning context

### 2.1 Planning area overview

The Scotian Shelf and Bay of Fundy planning area corresponds to DFO Maritimes Region's administrative boundaries and is approximately 476,000 km<sup>2</sup>. The planning area encompasses the offshore Scotian Shelf and portions of the Gulf of Maine, the Atlantic Coast of Nova Scotia, and the Bay of Fundy (Figure 3). The planning area is also called the Scotian Shelf and Bay of Fundy Bioregion in the marine conservation network planning process.

The planning area is a productive and diverse ecosystem, providing food and shelter for a variety of species ranging from microscopic plankton to the largest whales. Physical habitats are similarly diverse, with various coastal habitats, offshore banks and basins, steep slopes and underwater canyons, and the largely unknown abyssal plain.





**FIGURE 3** Boundary of the Scotian Shelf and Bay of Fundy planning area including the Bay of Fundy, Atlantic Coast, and offshore Scotian Shelf.

### The Atlantic Coast

The Atlantic Coast portion of the planning area includes the area from the high-water mark to the 12-nautical mile limit of the Territorial Sea extending from Cape North, Cape Breton, into the Bay of Fundy (Figure 3). The Atlantic Coast has a variety of shoreline habitats, such as rocky shores and headlands, large bays and inlets, estuaries, salt marshes, and sandy and rocky beaches. Information on the Atlantic Coast is patchy, with some areas studied extensively and others not at all. Several recent DFO studies have focused on identifying areas of ecological significance. Threats to coastal ecosystems are often linked to land-based sources of pollution, including effluent from wastewater treatment and runoff from coastal development, forestry and agriculture but may also include threats from climate change including sea-level rise. Another threat

is the loss of habitat from residential, industrial, and commercial development. It is estimated that 70 percent of the population in Nova Scotia lives within a coastal community.

### The offshore Scotian Shelf

Moving seaward from the coast, the offshore Scotian Shelf is defined as the waters from the 12-nautical mile limit of the Territorial Sea to the 200-mile limit of the Exclusive Economic Zone. It includes Georges Bank and offshore portions of the Gulf of Maine (see Figure 4 for location of under-sea features). The Scotian Shelf is considered an underwater extension of Nova Scotia's coast. It is separated from Georges Bank in the southwest by the Northeast Channel and from the Newfoundland Shelf in the northeast by the Laurentian Channel. The edge of the Scotian Shelf and Georges Bank



## 2. Planning context

are indented by deep submarine canyons. The shelf edge, where the seafloor begins to fall steeply away, lies at about 200 m depth. The Scotian Shelf slope and rise (the area from the edge of the continental shelf seaward to the abyssal plain) and the portions of the abyssal plain within Canada's Exclusive Economic Zone also form part of the offshore Scotian Shelf portion of the planning area. This area is highly productive and has supported commercial fisheries for hundreds of years. Whales and seabirds feed in offshore waters, and countless invertebrates add to the area's biodiversity.

### The Bay of Fundy

The Bay of Fundy is a narrow, funnel-shaped body of water, over 270 km long and 60 km wide at its widest point. It is known for its extreme tidal

ranges. The inner bay and outer bay have distinct characteristics, with the inner bay having the most extreme tidal ranges and extensive mudflats at low tide. Productivity in the area is exceptionally high and greatest at the mouth of the bay due to tidal mixing. Many different species take advantage of this productivity, including numerous marine mammals, birds, and fish. The endangered North Atlantic right whales feed on abundant copepods in the area during the summer and fall. An area in the Bay of Fundy near Grand Manan Island has been identified as critical habitat for this species (DFO 2014a). The Bay of Fundy is a Western Hemisphere Shorebird Reserve Network site that provides habitat for 70 percent of the eastern biogeographic population of Semipalmated Sandpipers during migration. It was also Canada's most popular nomination for the New Seven Wonders of the Natural World competition.



**FIGURE 4** Undersea features of the Scotian Shelf and Bay of Fundy planning area.

### Sub-regional highlight: the Minas Basin

The Minas Basin has been identified as an Ecologically and Biologically Significant Area (EBSA) by DFO (see [Annex B](#) for more information about EBSAs). The Minas Basin is a shallow macro-tidal inland sea in the Bay of Fundy, separated from the rest of the bay by a narrow strait known as the Minas Passage. It is home to a large complex ecosystem with a diversity of habitats, in part due to its high tides, which are amongst the highest in the world. The tides and resulting water movements, through constraining geological features such as the Minas Passage, result in high currents and unique physical conditions. This area continues to be a focus for: 1) in-stream tidal power development, 2) fish species of conservation concern, such as Striped Bass, Atlantic Salmon, Atlantic Sturgeon and American Eel, 3) the Mud-Piddock, a threatened intertidal mollusk species, 4) species distributions of fish, shore-birds and seabirds and 5) studying geological oceanographic processes such as the erosion, deposition and transport of sediments that affect bottom habitat.



Photo credit: H. Moors-Murphy (DFO) and New England Aquarium

### Changes in the Atlantic Ocean ecosystem

The Atlantic Ocean is made up of different marine ecosystems interlinked by biological components and physical and chemical processes. As climate change affects the world's oceans, many of the interconnected relationships that underpin Atlantic Ocean ecosystems are being altered, causing measurable changes from coastal regions to the offshore. Species movements, habitats, and diets are shifting at different rates and scales. Certain species are moving further north or away from the coast (Pinsky et al. 2013, USGCRP 2021), aquatic invasive species are moving into newly suitable habitats (Chan et al. 2019), and some species like the North Atlantic Right Whale are changing their distribution (Meyer-Gutbrod et al. 2021). Overall declines have been observed for some species such as leatherback sea turtles (DFO 2022, Holland et al. 2023). For others, there is evidence of population increases, such as some species of sharks (Curtis et al. 2014). Certain commercially important species may decline in abundance, with others becoming more commercially important. American lobster, a highly commercially valuable species in the Northwest Atlantic, has been increasing in recent decades, although climate change could influence the long-term sustainability of this fishery (Greenan et al. 2019).

These biological shifts are occurring alongside physical and chemical changes in the marine environment such as rising sea-surface temperatures, sea ice loss, ocean acidification, and pockets of low dissolved oxygen (hypoxia) (Altieri et al. 2015, Alexander et al. 2018, Doney et al. 2009, Jeffries et al. 2013). Such changes can in turn have effects on marine species such as thermal stress, habitat loss, and the creation of "dead zones" that are unable to sustain normal levels of fish and other marine species.

Future marine management actions will need to be adaptable and dynamic to be effective in addressing the effects of climate change on species, marine ecosystems, and coastal communities.

## 2.2 Legislative context

Sections 91 and 92 of the *Constitution Act* (1867) set out the division of powers between the federal and provincial governments. Under Section 91, the federal government has legislative authority over marine areas and fisheries within Canadian borders. Coastal and ocean management at the federal level is shared among several departments including DFO, Environment and Climate Change Canada (ECCC), Natural Resources Canada (NRCan), Transport Canada (TC), and Parks Canada.

Under the authority of the *Oceans Act*, marine spatial planning serves as a collaborative process through which integrated oceans management (IOM) may be achieved. Canada's legislative foundation for IOM lies in Part II, Section 31 of the *Oceans Act* which authorizes the Minister of Fisheries, Oceans, and the Canadian Coast Guard to lead and facilitate the development and implementation of integrated management plans in collaboration with provincial, territorial, and Indigenous governments, other federal departments and agencies, and stakeholders.

The authority granted to the Minister to lead the development and implementation of these plans does not override other departments with roles in managing the marine environment. The endorsement and approval of a Marine Spatial Plan by government decision-making authorities can demonstrate a commitment to implement the Plan in accordance with their departmental mandates, priorities, and capacities. As marine spatial plans are not currently legally binding, there is no expectation that participating federal, provincial/territorial, municipal departments or Indigenous governments are required to formally adopt or approve the Plan.

Legislation related to Indigenous Peoples is relevant context for MSP in Canada. Section 35 of the *Constitution Act* (1982) recognizes and affirms existing Aboriginal and treaty rights of the Indigenous Peoples of Canada. The Supreme Court of Canada has indicated that the purpose of Section 35 is the reconciliation of the Crown's sovereignty and the pre-existence of Indigenous societies, Aboriginal and treaty rights, and Indigenous interests. Federal policies and programs must strive to operationalize these concepts with Indigenous Peoples through dialogue and practical approaches.

## 2.3 DFO's Marine Planning and Conservation Program

Implementation of the *Oceans Act* is led by the Marine Planning and Conservation (MPC) Program of DFO. Work is undertaken in three related areas: Marine Planning, Marine Environmental Quality, and Marine Conservation.

### Marine Planning

The Marine Planning section of the MPC Program is responsible for advancing marine spatial planning within the Maritimes Region. MSP is being used by DFO to meet its obligations for oceans and coastal management under the *Oceans Act*. This includes the development and implementation of the Region's first-generation Marine Spatial Plan and the Canada Marine Planning Atlas. Since much of the focus of this first-generation Plan is on providing timely and accessible information, analysis, capacity support, engagement, governance arrangements and communications, it is anticipated that these efforts will continue.

### Marine Environmental Quality

With the passing of the *Oceans Act* in 1996, the Minister of Fisheries, Oceans, and the Canadian Coast Guard was given the ability to establish guidelines, objectives and criteria, as well as standards and requirements, related to marine environmental quality (MEQ) in estuarial, coastal, and marine waters. DFO's MEQ program was revitalized in 2018 through new funding under the Oceans Protection Plan (OPP) as a component of a broader Oceans Management Program that includes marine conservation and MSP. The MEQ program aims to understand the most pressing stressors on the marine environment and develop evidence based advice and management measures in collaboration with partners that help to fill gaps in management where additional management or mitigation of these stressors is needed. In the Maritimes Region, MEQ efforts are focused on three priority stressors: ocean noise, marine debris and microplastics, and marine contaminants.



### MEQ projects highlights

- The MEQ Coastal Acoustic Monitoring Project was launched in 2018 to better understand the presence of cetaceans and to characterize the soundscape at coastal sites across Nova Scotia. The success of the Coastal Acoustic Monitoring Project has been the result of the participation from local fishing organizations and other users of the ocean who provided invaluable knowledge and assistance to DFO during the project's planning and implementation.
- The MEQ group provides funding to various marine debris cleanup initiatives, organizes and/or participates in working groups relating to marine debris and microplastics, and is developing Pathways of Effects diagrams to better understand the potential impacts of marine debris on Atlantic Canadian ecosystems and species.
- MEQ also plays a supporting role in the organization and distribution of the Gulfwatch Contaminants Monitoring Program mussel sample archive and is exploring the potential for a small-scale contaminant monitoring project in Nova Scotia.

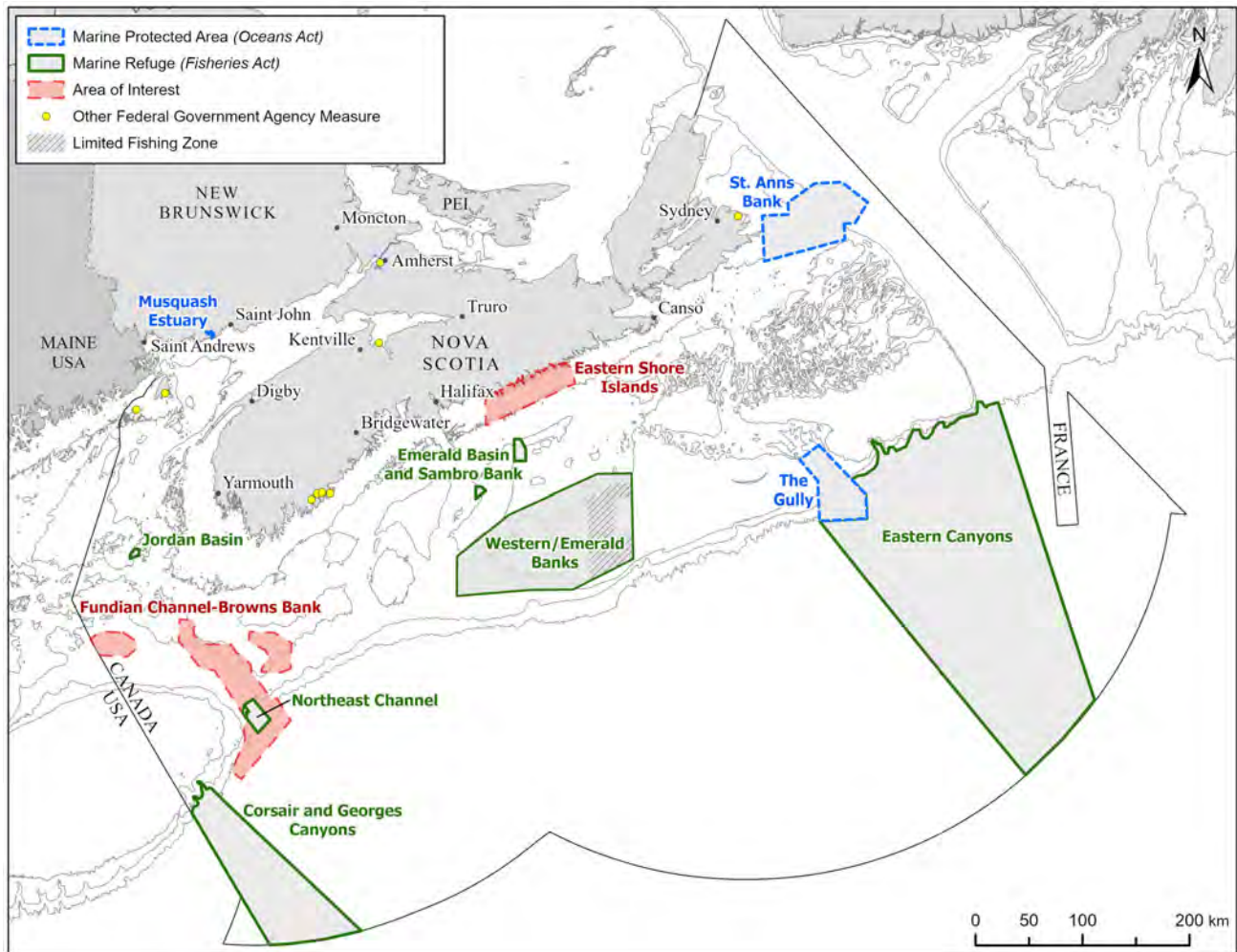
### Marine Conservation

The Marine Conservation section is responsible for advancing spatial marine conservation, including work to achieve marine conservation targets of conserving 25 per cent of Canada's oceans by 2025 and 30 per cent by 2030. This work includes the establishment of *Oceans Act* Marine Protected Areas (MPAs) and marine Other Effective area-based Conservation Measures (OECMs), effective management of existing protected and conserved areas, and conservation network planning. Current *Oceans Act*

MPAs within the Maritimes Region include the Gully, Musquash Estuary, and St. Anns Bank (Figure 5). Multiple marine OECMs also exist within the bio-region including Eastern Canyons Marine Refuge, which was recently established in 2022.

Site-specific establishment and consultation processes have been initiated by DFO Maritimes for the two Areas of Interest (AOIs) announced in 2018 for *Oceans Act* MPA designation: the Eastern Shore Islands AOI and Fundian Channel-Browns Bank AOI.





**FIGURE 5** Current conservation areas with marine components including *Oceans Act* Marine Protected Areas, *Fisheries Act* Marine Refuges, and other federal measures. Areas of Interest for future protection are also shown.

## 2.4 Marine Conservation network planning

Under the *Oceans Act*, the Minister of Fisheries, Oceans and the Canadian Coast Guard is responsible for leading the development of a national network of marine protected areas on behalf of the Government of Canada.

MPA networks, which are now referred to as marine conservation networks in Canada, are a collection of MPAs and other conservation areas that operate cooperatively to safeguard important eco-logical components of the ocean and its biodiversity.

Marine conservation networks are an important component of Canada's strategy for achieving its national and international marine conservation commitments, such as protecting 25 percent of Canada's oceans by 2025, and 30 percent by 2030.<sup>2</sup>

Marine conservation networks are composed of both MPAs and marine OECMs. An MPA is a clearly defined geographical space that is legally protected and managed with the aim of achieving long-term conservation goals.<sup>3</sup> Federal protected areas are established through legislated authorities, including Marine Protected Areas under the *Oceans Act* (DFO), marine National Wildlife Areas under the Canada

2 Reaching Canada's marine conservation targets. 2022. Available from: <https://www.dfo-mpo.gc.ca/oceans/conservation/plan/index-eng.html>

3 About Marine Protected Areas. 2021. Available from: <https://www.dfo-mpo.gc.ca/oceans/mpa-zpm/info-eng.html>



*Wildlife Act* (Canadian Wildlife Service), and National Marine Conservation Areas (NMCAs) under the *Canada National Marine Conservation Areas Act* (Parks Canada), and marine portions of National Wildlife Areas, Migratory Bird Sanctuaries, and National Parks.

Federal MPAs allow some current and future activities depending on their impacts to the ecological features being protected. In most cases, lower impact activities, such as fixed gear fisheries, recreational activities, and eco-tourism continue within conservation areas. For new federal MPAs established after April 25, 2019, the Government of Canada plans to prohibit the following activities, with limited exceptions, based on Canada's MPA Protection Standard:

- Oil and gas exploration, development and production;
- Mineral exploration and exploitation;
- Disposal of waste and other matter, dumping of fill, and deposit of deleterious drugs and pesticides; and
- Fishing via bottom-trawl gear.

Proposed additional limitations or prohibitions include the intent to enhance restrictions on certain discharges while vessels are within MPAs. The final parameters of these restrictions will be developed by Transport Canada in consultation with stakeholders and will take technical and operational limitations into consideration.

Marine OECMs, such as marine refuges (fisheries-area closures established under the Fisheries Act that meet the criteria in the Government of Canada's 2022 Marine OECM Guidance) provide long-term biodiversity conservation benefits.<sup>4</sup> The marine OECM Protection Standard takes a flexible,

risk-based approach, where existing or foreseeable activities in federal marine OECMs continue to be assessed on a case-by-case basis to ensure that the risks to the site's biodiversity conservation objectives have been avoided or mitigated, where possible.

Marine conservation planning and site establishment have been advanced in the Scotian Shelf and Bay of Fundy bioregion over the last two decades, with a number of Oceans Act MPAs and Fisheries Act marine refuges now in place and two Areas of Interest being advanced for establishment (Figure 5). DFO and its federal partners in Canadian Wildlife Service (CWS) and Parks Canada are advancing a marine conservation network plan for the coastal and offshore waters of the Scotian Shelf and Bay of Fundy bioregion. Undertaken through a systematic science based process, the conservation network will conserve ocean ecosystems and support sustainable fisheries, coastal communities, and other ocean activities. The conservation network will include individual sites of various shapes, sizes, and protection levels, each with its own conservation objectives. The final conservation network plan will provide long-term direction for spatial marine conservation and will be updated regularly to incorporate new information, knowledge and changing conditions to inform the selection of future marine conservation areas.

The targeted engagement phase for the marine conservation network plan was completed on March 31<sup>st</sup>, 2022 (Figure 6). During this phase, DFO sought feedback on the 2017 plan from other federal agencies, the Provinces of Nova Scotia and New Brunswick, First Nations and Indigenous organizations, and key stakeholder groups including fishing and aquaculture, as well as ENGOs and academia.



**FIGURE 6** Timeline for developing the marine conservation network plan for the Scotian Shelf and Bay of Fundy bioregion.

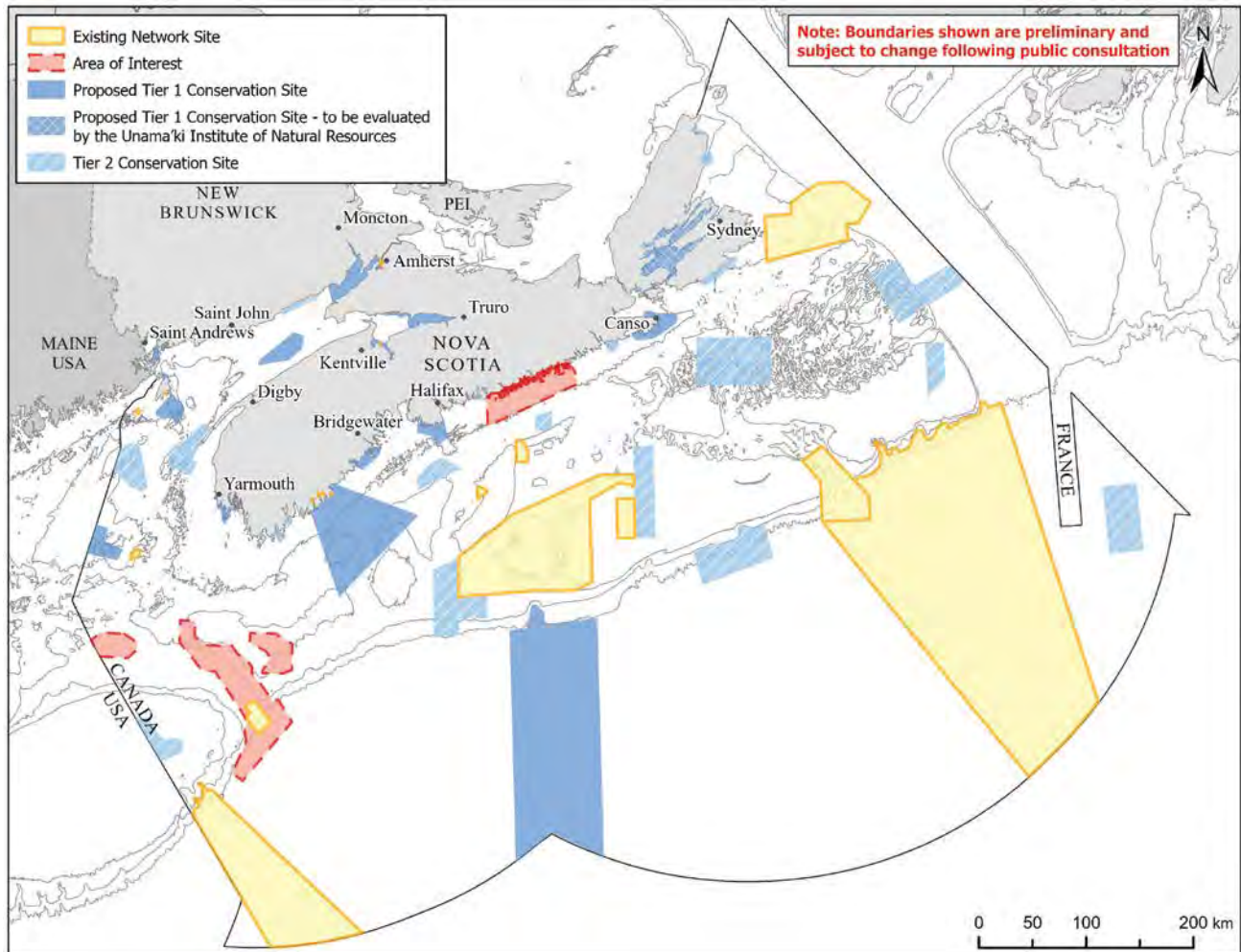
<sup>4</sup> Other effective area-based conservation measures. 2022. Available from: <https://www.dfo-mpo.gc.ca/oceans/oecm-amcepz/index-eng.html>



## 2. Planning context

Following this phase, the department worked to review the feedback and, where necessary, scheduled follow-up meetings with those involved in the targeted engagement phase to better understand their comments and concerns. Revisions to the network plan, such as boundary revisions of a proposed site and additional DFO Science analyses, were considered. The revised marine conservation network plan was completed in Fall 2023 (Figure 7).

An engagement and awareness process, with the goal of gathering further feedback from coastal communities, partners, stakeholders, and the Canadian public, is ongoing. This feedback will be considered and incorporated as appropriate into the marine conservation network plan for the Scotian Shelf and Bay of Fundy bioregion, which is expected to be completed by the end of 2024. Further information on the Region's network planning process can be found [here](#).



**FIGURE 7** Revised marine conservation network for the Scotian Shelf and Bay of Fundy bioregion as of Spring 2024.

### Linkage to MSP

The conservation network plan is a systematic science-based process that has included ecological, socio-economic and cultural information. MSP will support network implementation by providing updated data, enhanced governance and decision-support tools. An MSP approach will be used

to deliver the federal marine conservation mandate and through this approach, partners and stakeholders are engaged to meet conservation objectives while supporting sustainable human activities. The conservation network plan is an important component of the first-generation Marine Spatial Plan for the Scotian Shelf and Bay of Fundy planning area.

## 2.5 Indigenous communities and organizations

The waters within the Scotian Shelf and Bay of Fundy planning area have provided natural resources and bountiful harvests for Mi’kmaq, Peskotomuhkati and Wolastoqey peoples who have longstanding traditional and cultural connections to the marine environment and species. Providing for Indigenous peoples since time immemorial, these waters remain an economically and culturally important resource, including as an important source of food.

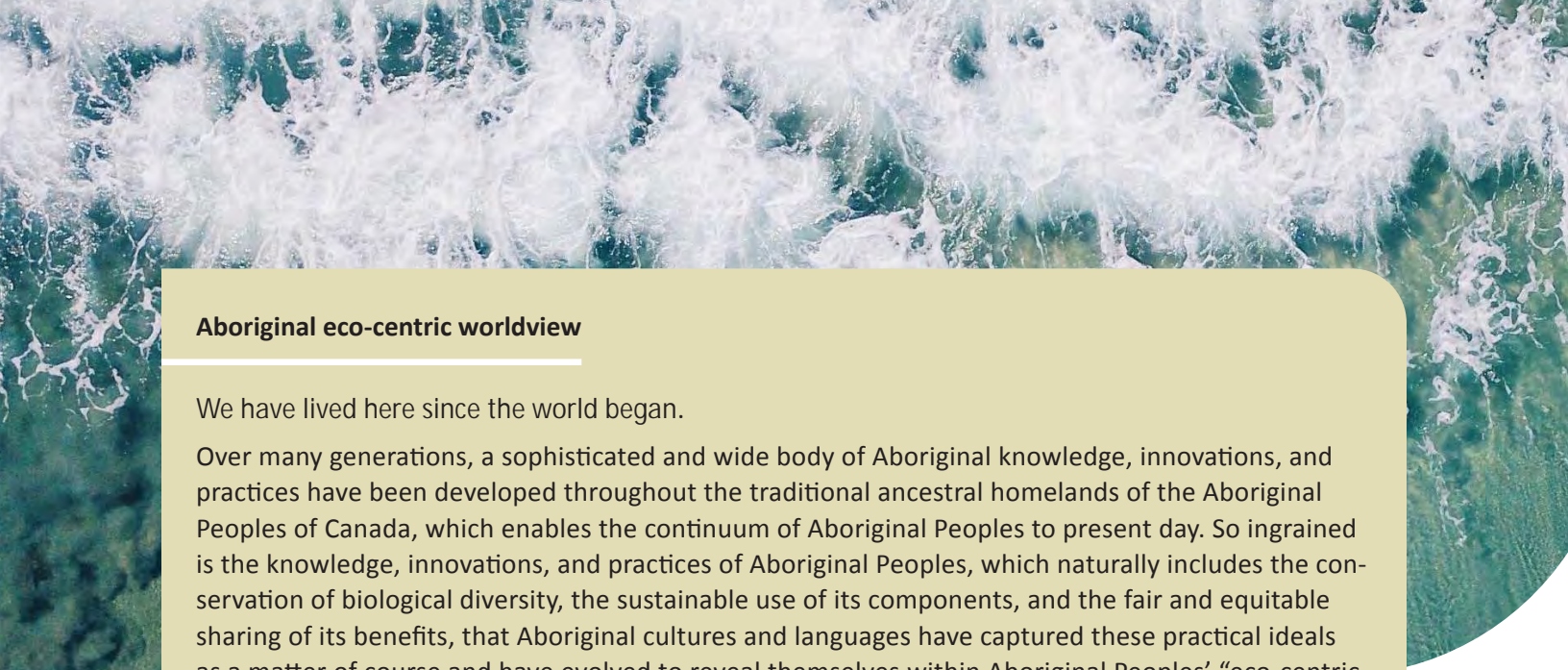
The Mi’kmaq are the founding people of Nova Scotia and remain the predominant Indigenous group within the Province. The Mi’kmaq Nation has existed in what is now Nova Scotia for thousands of years, and is made up of thirteen First Nations, each of which is governed by a Chief and Council.

All thirteen Chiefs in Nova Scotia regularly come together as the Assembly of Nova Scotia Mi’kmaq Chiefs. The Assembly plays a significant role in the collective decision-making for the Mi’kmaq of Nova Scotia, particularly on issues pertaining to Mi’kmaq rights and governance. In New Brunswick, the Fort Folly First Nation is the main Mi’gmaq community within the planning area for DFO Maritimes and there are also four Wolastoqey communities and one Peskotomuhkati community at Skutik. The Indigenous communities are included in [Table 1](#).

In addition, Indigenous people reside in other communities throughout the planning area. These individuals are represented by the Maritime Aboriginal Peoples Council with individual Councils in Nova Scotia and New Brunswick. This plan and its approach for engagement are meant to reflect the Department’s goal of advancing reconciliation with the Indigenous communities within the planning area.

**TABLE 1** Indigenous communities within the Maritimes Region in Nova Scotia and New Brunswick.

<b>Nova Scotia</b>	<b>Mi’kmaq of Nova Scotia</b> <ul style="list-style-type: none"><li>• Annapolis Valley First Nation</li><li>• Bear River First Nation</li><li>• Eskasoni First Nation</li><li>• Glooscap First Nation</li><li>• Membertou First Nation</li><li>• Millbrook First Nation</li><li>• Paqtnkek First Nation</li><li>• Pictou Landing First Nation</li><li>• Potlotek First Nation</li><li>• Sipekne’katik First Nation</li><li>• Wagmatcook First Nation</li><li>• Wasoqopa’q First Nation</li><li>• We’koqma’q L’neu’kati</li></ul>
<b>New Brunswick</b>	<b>Peskotomuhkati Nation at Skutik</b> <b>Mi’gmaq of New Brunswick</b> <ul style="list-style-type: none"><li>• Fort Folly First Nation</li></ul> <b>Wolastoqey Nation</b> <ul style="list-style-type: none"><li>• Kingsclear First Nation</li><li>• Oromocto First Nation</li><li>• Saint Mary’s First Nation</li><li>• Woodstock First Nation</li></ul>



## Aboriginal eco-centric worldview

We have lived here since the world began.

Over many generations, a sophisticated and wide body of Aboriginal knowledge, innovations, and practices have been developed throughout the traditional ancestral homelands of the Aboriginal Peoples of Canada, which enables the continuum of Aboriginal Peoples to present day. So ingrained is the knowledge, innovations, and practices of Aboriginal Peoples, which naturally includes the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of its benefits, that Aboriginal cultures and languages have captured these practical ideals as a matter of course and have evolved to reveal themselves within Aboriginal Peoples' "eco-centric worldview". A tenet of the eco-centric worldview is that humankind is an integral part of the natural world, interconnected and interdependent on all other creation. The ecology of a place is paramount, with humankind as part of that, no greater and no lesser than any other part of creation.

In a recent turn of events brought about by multiple global crises, including a biodiversity and a climate crises, many now look to the potential that Aboriginal Peoples, possessing Aboriginal knowledge, practices, and innovations, can share, teach, and guide others to understand Aboriginal Peoples' concepts of conservation and sustainability, realized through the practices of "ecosystem-based management" and a "precautionary approach" which are already found in the psyche and everyday life pattern of the Aboriginal person living the traditional life-style. Though willing to teach, share, and take a step forward with those who are unfamiliar with the Aboriginal eco-centric worldview, many Aboriginal persons remain hesitant, that what is shared may be misinterpreted, misused, or may become yet another form of exploitation of Aboriginal Peoples. Aboriginal Peoples foremost require good faith and assurances that they will not be exploited and that the path will lead to reconciliation, starting with recognizing Aboriginal Peoples' rights and addressing the socio-economic development needs of Aboriginal Peoples.

The Mi'kmaq use natural resources within the context of Netukulimk, which is a Mi'kmawey concept that expresses the Aboriginal eco-centric worldview, that includes the use of the natural bounty provided by the Creator for the self-support and well-being of the individual and the community at large. The Mi'kmaq find it essential to share the principle and practice of Netukulimk with others so that they may come to understand and adopt a similar view that each component of the natural world can be preserved, protected, sustainably used, and shared in a balanced way which respects the past, provides for the present, and meets the needs for the future.

*Excerpt from: Introductory Marine Planning Initiative Project. Maritime Aboriginal Peoples Council. Oceans Management Contribution Program. 2021-22 Report.*



## 2. Planning context

Numerous First Nation-run organizations serve the diverse needs of Indigenous people in Nova Scotia and New Brunswick. Efforts have begun and will be ongoing to work with many of these organizations

seeking their input and involvement in the marine spatial planning process. Key Indigenous organizations are included in [Table 2](#) below.

**TABLE 2** Key Indigenous organizations within the Maritimes Region in Nova Scotia and New Brunswick.

<b>Nova Scotia</b>	<ul style="list-style-type: none"> <li>• Assembly of Nova Scotia Mi'kmaw Chiefs</li> <li>• Kwi'mu'kw Maw-klusuaqn Negotiation Office</li> <li>• Confederacy of Mainland Mi'kmaq</li> <li>• The Union of Nova Scotia Mi'kmaq</li> <li>• Unama'ki Institute of Natural Resources</li> <li>• Native Council of Nova Scotia</li> </ul>
<b>New Brunswick</b>	<ul style="list-style-type: none"> <li>• New Brunswick Assembly of First Nations</li> <li>• Wolastoqey Nation of New Brunswick</li> <li>• Maliseet Nation Conservation Council</li> <li>• New Brunswick Aboriginal Peoples Council</li> <li>• Peskotomuhkati Nation at Skutik</li> <li>• Migmawe'l Tplu'taqnn Incorporated</li> </ul>
<b>Nova Scotia and New Brunswick</b>	<ul style="list-style-type: none"> <li>• Atlantic Policy Congress of First Nations Chiefs</li> <li>• Maritime Aboriginal Peoples Council</li> </ul>

### Indigenous fisheries

- **Food, Social and Ceremonial (FSC):** As recognized by the Constitution of Canada and clarified by the Supreme Court of Canada through the 1990 *Sparrow* decision, Indigenous Peoples have the right to fish for food, social and ceremonial purposes. This right can only be limited or infringed if justified in specific circumstances, such as for conservation purposes. To authorize and support the exercise of this right within an integrated fisheries management and regulatory framework, DFO issues FSC licences to Indigenous communities across Canada for a variety of species. The right to fish for FSC purposes is communal, and the FSC fishing license is issued to the Indigenous Nation. The Nation may then designate harvesters to catch what is needed for themselves and/ or their community under the licence for FSC purposes. Licences specify the species and various conditions in place to manage the fishery (geographic area, level of effort, conservation measures) under which Indigenous communities can exercise this right.
- **Communal Commercial:** Following Supreme Court decisions affirming Aboriginal and treaty rights to fish for commercial purposes, DFO began issuing communal commercial licences, which are an integral part of many Indigenous communities. Communal commercial fishing licences, which are distinct from commercial fishing licences (issued to individuals or companies), provide fisheries access and generate employment and income for communities. Unlike catch harvested under FSC licences, the catch from communal commercial licences may be sold.

- **Moderate Livelihood:** First Nations in the Atlantic and Gaspé region have a treaty right to fish in pursuit of a moderate livelihood. The Government of Canada recognizes this right and DFO continues to work with First Nations and communities to implement the *Marshall* decisions. DFO is working with these communities on the ongoing implementation of their treaty right to fish in pursuit of a moderate livelihood while maintaining a sustainable fishery for all harvesters. There are different approaches to further implement treaty rights, depending on Treaty Nations' preferences: medium-to-long-term Rights Reconciliation Agreements (RRAs); and short-term understandings based on community-developed moderate livelihood fishing plans for a fishing season. DFO has been working with Indigenous communities to further their right to fish in pursuit of a moderate livelihood by reaching understandings that authorize community members to fish under community-developed moderate livelihood fishing plans. Under Moderate Livelihood Understandings, communities identify community members who wish to fish in pursuit of a moderate livelihood under their community-developed plan and they are designated as authorized harvesters under a licence issued by DFO. Since 2021, the Department has reached interim understandings that have seen multiple First Nations fishing lobster under Moderate Livelihood Understandings, and selling their catch during the DFO established seasons, without increasing overall fishing effort. Multiple Rights Reconciliation Agreements have been reached with First Nations in the Atlantic provinces and in Quebec. The Department's priority continues to be the further implementation of treaty rights in a way that supports an orderly fishery and includes measures for conservation.

## 2.6 Lessons from previous ocean management initiatives

The MPC Program in the Maritimes Region has taken a “learn by doing” approach in meeting the oceans management commitments outlined in Canada's *Oceans Act*. When the IOM Program began in Canada over 20 years ago, there was little previous experience to draw from. Many lessons have been learned over this time, from the early work on the Region's Large Ocean Management Area on the Eastern Scotian Shelf, coastal management areas in the Bras d'Or Lake and Southwest New Brunswick, through the selection, designation and on-going management of the Gully, Musquash, and St. Anns Bank marine protected areas as well as other conservation areas, and the analysis and development of a regional conservation network. Considerable capacity has been developed over the years in several key areas that continue to support the *Oceans Act* mandate and help advance a marine spatial planning program. Additional past integrated oceans management initiatives are described in the *Regional Oceans Plan* (DFO 2014).

The MPC Program is the lead for marine spatial planning and has developed strong multidisciplinary capacity in the areas of oceans and coastal management, conservation planning, engagement and collaboration, decision support, and the analysis and use of spatial data and information including geographic information systems (GIS) and Marxan analysis. The development of knowledge, skills, and experience in policy, planning, and management has been instrumental given the multidisciplinary nature of the work. This has been supported by the need to facilitate work among the diverse interests involved in the marine and coastal environments, including Indigenous communities and organizations, other levels and departments of government, industry, academics, conservation organizations, and coastal communities. This experience, and the structures and relationships created to support this engagement, remain invaluable.

Key lessons from these experiences are reflected in the current approach being advanced for the MSP Program. Included is the focus on working collaboratively, supporting the capacity of others to participate in manageable processes, increasing communication and transparency, and focusing on tangible outcomes including those related to supporting better planning and decision making by the Government of Canada and others through the provision of timely and accessible information and tools.

## 2.7 Engagement approach

Effective engagement with partners and stakeholders is a key component of any MSP process to ensure an exchange of information and perspectives. This section describes the engagement approach taken by the Maritimes Region for the first-generation Marine Spatial Plan, including the key organizations involved (Table 3). As the MSP Program in Canada is still developing, a key focus will be on future efforts.

The goals of regional engagement on MSP in the short term include:

- Communicate our regional approach to MSP (i.e., support for sector-based planning and management).
- Demonstrate how to use the Canada Marine Planning Atlas and discuss data and information for MSP.
- Receive input on regional MSP priorities and scope to be reflected in the Plan.
- Discuss what MSP processes and governance could look like in the future.

**TABLE 3** Key participants to be involved in the MSP process in Maritimes Region.

Category	Groups Involved
<b>Fisheries and Oceans Canada</b>	<ul style="list-style-type: none"> <li>• Aquatic Ecosystems (led by the Marine Planning and Conservation Program)</li> <li>• Science</li> <li>• Policy and Economics</li> <li>• Resource Management</li> <li>• Communications</li> <li>• Other DFO regions and National Headquarters (NHQ)</li> </ul>
<b>Federal departments</b> <i>**Federal departments that have received funding to support MSP.</i>	<ul style="list-style-type: none"> <li>• Natural Resources Canada (NRCan)**</li> <li>• Environment and Climate Change Canada (ECCC)**</li> <li>• Transport Canada (TC)**</li> <li>• Parks Canada Agency (PCA)</li> <li>• Atlantic Canada Opportunities Agency (ACOA)</li> <li>• Impact Assessment Agency of Canada (IAAC)</li> </ul>
<b>First Nations</b>	<ul style="list-style-type: none"> <li>• Nova Scotia Mi'kmaw First Nations</li> <li>• New Brunswick Mi'gmaq First Nations</li> <li>• Wolastoqey Nation</li> <li>• Peskotomuhkati Nation</li> </ul>
<b>Indigenous Organizations</b>	<ul style="list-style-type: none"> <li>• The Confederacy of Mainland Mi'kmaq -Mi'kmaw Conservation Group (MCG)</li> <li>• Kwilmu'kw Maw-klusuaqn (KMKNO)</li> <li>• Maritimes Aboriginal Peoples Council (MAPC)</li> <li>• Unama'ki Institute of Natural Resources (UINR)</li> <li>• Wolastoqey Nation in New Brunswick</li> <li>• Migmawe'l Tplu'taqnn Incorporated (MTI)</li> </ul>
<b>Municipalities</b>	<ul style="list-style-type: none"> <li>• Various municipalities throughout Nova Scotia and New Brunswick</li> </ul>
<b>Stakeholders</b>	<ul style="list-style-type: none"> <li>• Marine industry sectors (various)</li> <li>• Non-governmental organizations</li> <li>• Academics</li> <li>• Communities</li> </ul>



## 2. Planning context

Early engagement efforts have focused on federal, provincial, and municipal levels of government and Indigenous organizations. [Figure 8](#) provides a timeline for MSP engagement in the Scotian Shelf and Bay of Fundy planning area. In 2023, focused internal engagement with regional DFO sectors was initiated. Throughout 2023 DFO continued to identify interests and priorities for MSP through external engagement with First Nations and Indigenous organizations, industry (i.e., fishing, aquaculture, energy), and environmental non-governmental organizations (ENGOS). External engagement included sector-specific workshops

with a range of topics, such as MSP products (the Canada Marine Planning Atlas and decision-support tools), MSP and conflict avoidance, and MSP in the future. Throughout the engagement process, Atlas tutorials to demonstrate how the tool can be used were offered. Communication products were distributed to provide a plain language explanation of MSP. More information on communications products can be found in [Section 4.11](#). As this work advances in the planning area, additional collaborative governance structures may be developed where necessary. Engagement will be an ongoing aspect of this process.



**FIGURE 8** Marine Spatial Plan development timeline.

### Indigenous engagement

DFO has worked to engage with First Nation and Indigenous organizations early in the MSP process so that their input could help shape the ideas, needs, and priorities of this first-generation Plan. Engagement is focused on building upon previous experiences and existing relationships to support the advancement of MSP. DFO works through the Kwilmu'kw Maw-klusuaqn Negotiation Office (KMKNO) to engage with Nova Scotia First Nations. Engagement with New Brunswick First Nations occurs through the Mi'gmawe'l Tplu'taqnn Incorporated (MTI) and the Wolastoqey Nation of New Brunswick (WNB), and directly with the Peskotomuhkati. Contribution Agreements also support engagement efforts by providing First Nations and Indigenous organizations with an enhanced capacity to engage their own community members and DFO to undertake projects on relevant topics, including MSP and marine conservation. Contribution Agreements also strengthen the relationships between DFO staff and these communities

through regular meetings and dialogue. These arrangements help to create a clearer understanding of each other's perspectives and roles.

DFO has also engaged with the Maritimes Aboriginal Peoples Council (MAPC) to share information on MSP and discuss their organizations' priorities and interests. DFO Maritimes typically engages with the Native Council of Nova Scotia (NCNS) and New Brunswick Aboriginal Peoples Council (NBAPC) by coordinating through MAPC. The Mi'kmaw Conservation Group (MCG) and Unama'ki Institute of Natural Resources (UINR) are involved in MSP in part through their participation in the KMKNO-DFO Aquatic Ecosystems Working Group.

### Federal engagement

The focus of federal engagement for MSP is on program development, information sharing, work planning, priority development, and alignment of messaging and approaches. Engagement with other federal departments on MSP occurs at the Atlantic Coordination Table (ACT).

### Provincial engagement

Engagement on MSP with the Government of Nova Scotia is occurring through Provincial-DFO Aquatic Ecosystems bilateral tables, including both DFO Maritimes and Gulf Regions. DFO Maritimes Region leads coordination and agenda-setting with the Province through the Nova Scotia Department of Intergovernmental Affairs. Engagement with the Government of New Brunswick is coordinated through the New Brunswick Department of Intergovernmental Affairs and led by DFO's Gulf Region.

### Municipal engagement

Municipal government engagement included workshops and discussions on MSP across the planning area where many municipal governments are located. These sessions served to introduce the concept of MSP and to get a preliminary sense of their capacity, interests, and priorities. Additional engagement was sought through workshops in the later part of 2023.

### Industry and stakeholder engagement

DFO Maritimes Region engages with the industry and stakeholders through the groups listed below. Multi-sector information sessions were held as part of engagement sessions to ensure the involvement of additional groups.

Industry and stakeholder groups include:

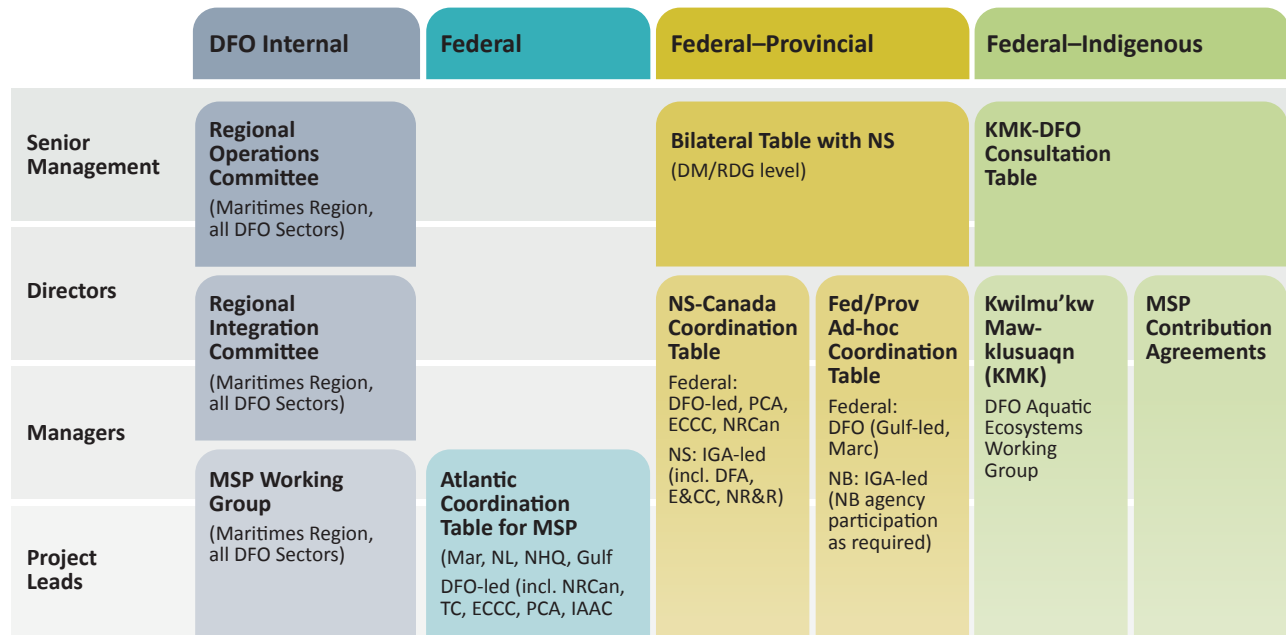
- Southwest Fundy Progressive Protection Council
- Scotia-Fundy Fishing Sector Roundtable
- Commercial Species Advisory Committees
- Nova Scotia Fisheries Alliance for Energy Engagement
- Atlantic Groundfish Council
- DFO ENGO Forum
- Bay of Fundy Ecosystem Partnership
- Gulf of Maine Council



## 2.8 Governance

Meaningful and effective governance arrangements are required to ensure all parties can participate in, contribute to and benefit from the MSP process. Within the Maritimes Region, several governance and institutional arrangements are in place to assist

with this work. Additional arrangements will be considered as this work evolves and as deemed beneficial. Some of the current arrangements within DFO, with other federal departments, the provinces and Indigenous organizations are outlined in [Figure 9](#).



**FIGURE 9** Governance diagram for Maritimes Region (as of Spring 2024) depicting the main federal, provincial, and Indigenous governance structures that relate to MSP at the regional level.

Other governance arrangements have developed within the DFO Maritimes Region planning area to support more sub-regional or site-specific work. One example includes the work of the Bras d'Or Lake Collaborative Environmental Planning Initiative which has been a partnership of the

Indigenous, federal, provincial and municipal governments, local NGOs, academics, industry, and community members. Another such arrangement is the Minas Basin Working Group which is helping coordinate research in this important ecological area.



### Sub-regional highlight: The Bras d'Or Lake

The Bras d'Or Lake in Nova Scotia is a unique estuary at the heart of Cape Breton Island. The estuary, coastal waters, and numerous freshwater rivers and streams have sustained generations of people, beginning with the Mi'kmaq, whose growing communities continue to rely on its natural resources and culturally important areas. In recent years however, the health of the Bras d'Or has diminished from anthropogenic pressures such as overfishing, the introduction of invasive species, the impacts from forestry, sewage inputs, and unsuitable land development practices. To help address these concerns the Bras d'Or Collaborative Planning Initiative (CEPI) has been in place as a partnership between Indigenous, federal, provincial, municipal governments, NGOs, industry, academics, and community members. Numerous studies and projects have been undertaken through this partnership within the Bras d'Or to better understand its conditions and address these concerns. Work is ongoing and led by the Unama'ki Institute of Natural Resources (UINR) that represents the First Nations in Cape Breton and who play the secretariate and convenor role for this group of interested collaborators.

Further information on the Bras d'Or CEPI can be found [here](#).



3

## Goals

The current marine spatial planning approach aims to add value to the existing ocean and coastal management regime within the planning area. In doing so, two specific goals are being pursued – improved planning and improved decision-making (Figure 10). These goals are supported by specific objectives within the MSP process as illustrated in [Table 4](#).



### Marine Spatial Planning

Improved Planning

Improved Decision-making

**FIGURE 10** The goals and objectives of marine spatial planning in Maritimes Region.

### 3.1 Improved planning

Marine spatial planning processes are about the future. What activities, locations, levels of use, and environmental conditions are desirable? Are different groups and organizations able to have a say in this future? What trends are observed? What tradeoffs or compromises are needed? Do we have the right information? If commitments are made in planning, how will they be enforced? How will climate change affect our planning? These questions and many others must be addressed through a process to plan a desirable future. While the plans developed under MSP are not regulatory in nature or enforceable under the *Oceans Act*, they should help influence the efforts and decisions of each partner that contributed to it.

### 3.2 Improved decision-making

The second goal for the MSP process is improved decision-making. Improved decision-making is being pursued to help realize the vision and priorities outlined through the planning process and fulfill the legislative mandates of many different organizations. The first-generation Plan is not a zoning scheme as is often associated with MSP. Instead, the Plan aims to add value to the numerous decisions that are associated with the management of the marine environment by a diverse range of users and regulators. These decisions may be improved by better or more accessible information, broader perspectives, or decision-support tools for specific issues.

**TABLE 4** Goals and objectives of the MSP Program in Maritimes Region.

GOAL 1 Improved planning	GOAL 2 Improved decision-making
<p>Objectives:</p> <ul style="list-style-type: none"><li>• Develop a clear framework for MSP</li><li>• Balance social, cultural, economic and environmental considerations</li><li>• Set priorities (seek tradeoffs)</li><li>• Be adaptable (to address issues such as climate change)</li><li>• Share data and knowledge products</li><li>• Ensure effective participation</li><li>• Improve communications</li></ul>	<p>Objectives:</p> <ul style="list-style-type: none"><li>• Develop knowledge products and decision-support tools</li><li>• Coordinate and streamline decision-making</li><li>• Seek policy and legislative improvements</li><li>• Understand and consider cumulative impacts</li><li>• Share data and knowledge products</li><li>• Ensure effective participation</li><li>• Improve communications</li></ul>



### 3. Goals

Both government and marine users participate in marine spatial planning processes through various mechanisms where information, tools, coordination, and communication products help support and improve existing plans and decision-making processes. These plans and decisions result in specific outcomes which may in turn influence the government, partners, and marine

users in a manner as shown in [Figure 11](#).

Marine users and government can use MSP to help improve their planning and decision-making processes, whose outcomes in-turn influence these marine users and governments.



**FIGURE 11** The marine spatial planning process.

# 4

## Objectives

The objectives outlined in this section will help achieve the goals of this first-generation Marine Spatial Plan. Efforts to meet each of these objectives will form part of future MSP implementation activities. Practical benefits associated with MSP and linkages to the objectives of this Plan are outlined in Table 5.

**TABLE 5** Key benefits of MSP and example objectives which enable them.

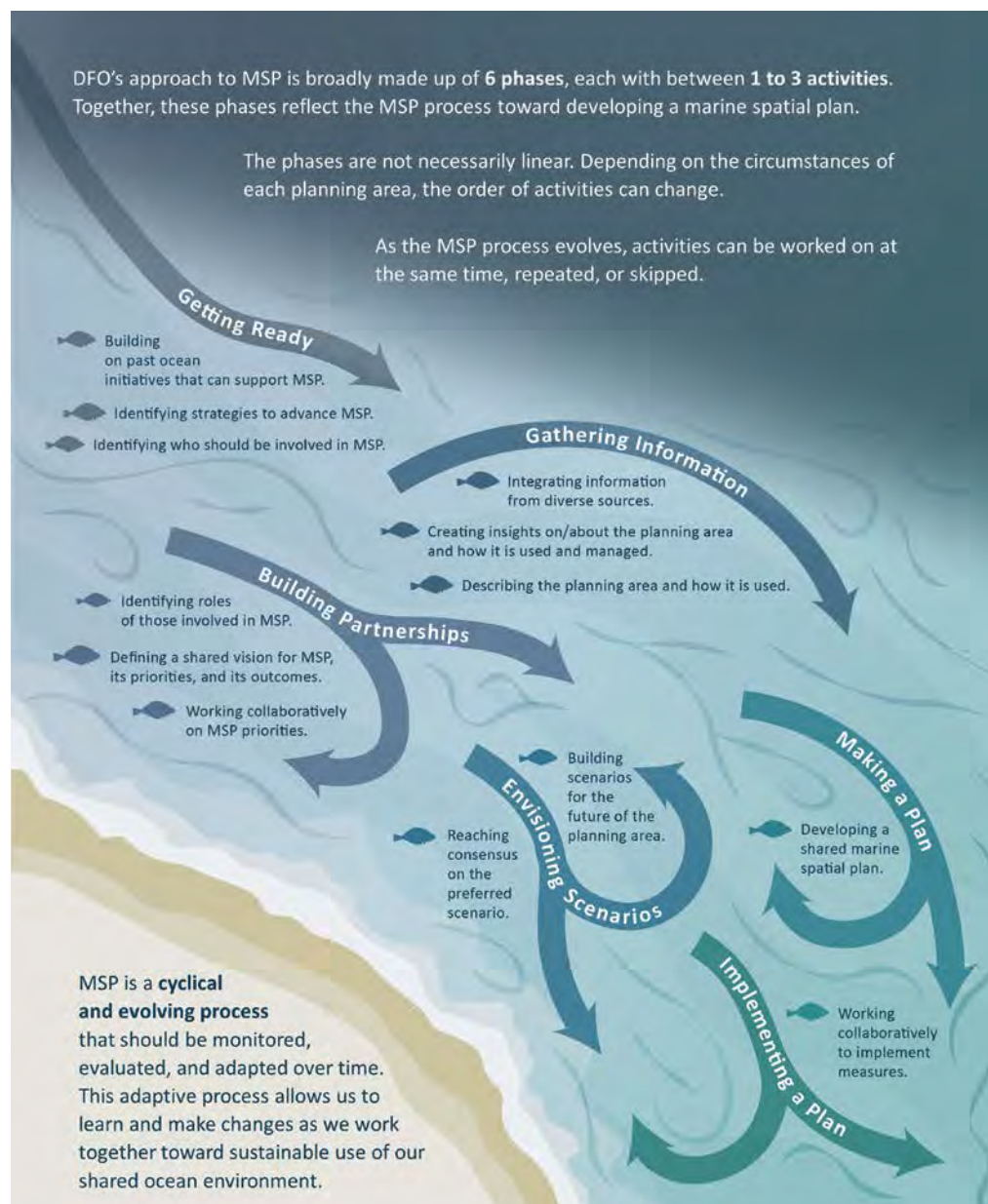
Key benefits of MSP	MSP objectives
Supporting economic opportunities	<ul style="list-style-type: none"> <li>• Provide timely and accessible information</li> <li>• Develop knowledge products and decision-support tools (including spatial analysis)</li> <li>• Ensure effective participation</li> </ul>
Reducing conflicts with siting new activities	<ul style="list-style-type: none"> <li>• Develop knowledge products and decision-support tools (including spatial analysis)</li> <li>• Provide timely and accessible information</li> </ul>
Improving awareness and understanding of ocean issues	<ul style="list-style-type: none"> <li>• Ensure effective participation</li> <li>• Improve communications</li> <li>• Develop knowledge products and decision-support tools (e.g. Canada Marine Planning Atlas and Cumulative Impact Mapping)</li> </ul>
Valuing and including multiple perspectives and knowledge systems	<ul style="list-style-type: none"> <li>• Be adaptable</li> <li>• Ensure effective participation</li> <li>• Balance social, cultural, economic and environmental considerations</li> </ul>
Planning at local to regional scales	<ul style="list-style-type: none"> <li>• Set priorities</li> <li>• Balance social, cultural, economic and environmental considerations</li> <li>• Develop knowledge products and decision-support tools (including spatial analysis)</li> </ul>

## 4.1 Develop a framework for marine spatial planning

For DFO to support the advancement of MSP, a framework is required to explain the scope and approach being taken, and the possible outcomes for those involved. This first-generation Marine Spatial Plan is the framework for the Scotian Shelf and Bay of Fundy planning area.

DFO's National Guidance for Marine Spatial Planning (DFO 2024a) has helped provide the

support for these plans in Canada. It has been based on international guidance developed by the Intergovernmental Oceanographic Commission under the United Nations Educational, Scientific and Cultural Organization (UNESCO) and broadly reflects the vision of Canada's Oceans Strategy. MSP practitioners and managers are given a basic outline to support discussions with partners about the marine spatial planning process and what should constitute the Plan's key elements. The National Guidance document outlines the general components for the first-generation marine spatial plans in Canada including the general activities illustrated in [Figure 12](#).



**FIGURE 12** DFO's adaptive approach to Marine Spatial Planning.



The DFO National Guidance provides an outline for these MSP frameworks in Canada. It should be noted that this current first-generation Plan only reflects the initial stages of this MSP process. Future efforts may pursue additional stages while supporting ongoing work from the first stages.

## 4.2 Balance social, cultural, economic and environmental considerations

As outlined in the introduction, MSP is an approach to management that aims to support a range of social, cultural, economic, and environmental considerations for a specific area. Ocean governance and management approaches that focus on a single sector, species, or activity do not account for the cumulative impacts of multiple uses. As an integrative approach to management, MSP attempts to consider the entire ecosystem, including human uses that are for economic, social, and cultural purposes. MSP can be used to assess conflicts between human uses, and between human uses and environmental components, and be a venue to discuss and analyze tradeoffs while aiming to maximize benefits for all involved.

To achieve a balance between social, cultural, economic, and ecological considerations within the planning area, engagement with ocean users is required to ensure that different perspectives, interests, and priorities are reflected in the Marine Spatial Plan. As well, social, cultural, economic, and environmental data and information from the planning area is being sought for the MSP decision-support tools and mapping products, such as the Canada Marine Planning Atlas, the Maritimes Ecosystem-Based Management (EBM) Framework, and the Strategic Ecosystem/Activity Compatibility Assessment Tool (see [section 4.5](#)). These, as well as any tools developed in the future, provide analysis of human use and ecosystem components in the planning area with the intent of improving decision-making and planning. For example, this approach to planning will be able to identify areas in need of conservation and protection (i.e., the marine conservation network plan), along with areas suitable for development and other human uses. The ability to balance social, cultural, economic, and environmental objectives throughout the MSP process depends on the degree of involvement from many regulators, rights holders, user groups and citizens.

### Socio-economic considerations in MSP

Robust information is needed to consider social, cultural, economic, and ecological objectives related to MSP. Environmental and economic information is typically included in MSP processes. While social and cultural considerations are primarily received through consultation and engagement activities, broader socio-cultural factors (e.g., well-being, equity, social connections to nature) are generally not analyzed due to a lack of data and internal social science research capacity. In 2021, a research report was developed for DFO that outlines best practices for including this information in MSP processes, focusing on the current planning area (Amos 2021).

The report describes opportunities for incorporating social, cultural, and economic information in the MSP process. Key points include:

- Socio-economic factors should be considered in assessing the need for MSP.
- Socio-economic components should be considered throughout the MSP process, from budget to establishing an MSP team, developing the workplan, data collection, analysis and decision-making.
- Stakeholder engagement is key to meaningfully incorporating social and cultural information into spatial planning.
- Data collection approaches should be tailored to the MSP approach and the context. Common approaches include compiling third-party data and/or observational data, consulting experts, conducting public consultations, focus groups and/or workshops and facilitating participatory approaches.
- Data analysis tools can be categorized as economic valuation tools, spatial analysis tools and social impact assessments. The type of analysis used depends upon the previous steps in the MSP process.

The author used four case studies to illustrate different approaches to including socio-economic information in MSP: Moray Firth in Scotland, England South Inshore and South Offshore Marine Spatial Plan, Raja Ampat MPA Network, and Haida Gwaii Marine Plan.

## 4.3 Set priorities

MSP can provide the benefit of a consistent approach for a planning area based on common priorities. In the early stages of this process, partners will be engaged to clarify and share their priorities. Future goals, objectives, and targets can then be developed which support this vision. Participants will be engaged to understand whether this vision reflects their respective priorities; this engagement will be repeated regularly to ensure the process is relevant to changing interests and needs.

Through the identification of common priorities, a shared approach can be developed that reflects a range of interests. From this, work plans can be developed collaboratively to achieve these outcomes.

## 4.4 Be adaptable

The MSP process must be adaptable to the realities of a changing world. Change will come in several different forms, ranging from changes in the knowledge of the natural environment, to changes in the economic priorities of different activities, to changes in social and cultural importance placed on distinct aspects of our coastal and marine areas. Climate change is bringing about overarching shifts that affect all aspects of the planning area. Being adaptive to refocusing priorities, having governance mechanisms to continually engage and discuss views, updating environmental, social, and economic data, products, and maps, and revisiting the Plan regularly, will allow it to reflect the latest knowledge and perspectives required to adapt to climate change.

### Climate change

Building a better understanding of the effects of climate change, the impacts of human activities, and the natural processes that drive our oceans will be essential for evidence-based decision-making and effective planning. Ongoing research of the marine environment will help improve management and conservation measures and assess how Canada is meeting its goals under the Global Biodiversity Framework Target 8 as part of the Convention on Biological Diversity.

Target 8: Minimize the Impacts of Climate Change on Biodiversity and Build Resilience.

*“Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solution and/or ecosystem-based approaches, while minimizing negative and fostering positive impacts of climate action on biodiversity.”*

– Convention on Biological Diversity

## 4.5 Develop knowledge products and decision-support tools

A range of knowledge products and decision-support tools have been and will continue to be developed in DFO Maritimes Region to improve existing decision-making processes. Some of these

tools are meant for internal purposes to assist DFO staff with undertaking their roles more effectively, while others are intended for use by a wide range of interested parties. Additional tools beyond those described will be developed based on input from our key planning partners on a continual basis. [Table 6](#) lists the current tools developed by DFO Science and MPC in the Maritimes Region, as well as additional federal tools.

**TABLE 6** Current DFO and other federal knowledge products and decision-support tools developed in Maritimes Region.

Current DFO knowledge products and decision-support tools	Intended users
Canada Marine Planning Atlas	Internal and External
Strategic Ecosystem/Activity Compatibility Assessment Tool (SEACAT)	Internal and External
Ocean Use Compatibility Analysis (OUCA)	Internal and External
Marxan with Zones offshore wind analysis	Internal and External
DFO Maritimes Ecosystem-Based Management (EBM) Framework	Internal and External
Open Data Publications	Internal and External
NET Force Eelgrass Distribution	Internal and External
Cumulative Impacts Mapping	Internal and External
Reproducible Reporting Tool	Internal
Coastal Infrastructure Vulnerability Index (CIVI)	Internal
Climate Change Vulnerability Evaluation (CCVE)	Internal
Canadian Extreme Water Level Adaptation Tool (CAN-EWLAT)	Internal and External
Other federal decision-support tools	Intended users
Marine Cadastre	Internal and External
Open Science Data Platform	External
Marine Spatial Data Infrastructure (MSDI)/Federal Geospatial Platform (FGP)	Internal and External



### Canada Marine Planning Atlas

The Canada Marine Planning Atlas is an interactive web mapping tool for decision-makers and other end-users to access information about ecological sensitivities, processes and features as well as human activities in Canada's marine spatial planning areas. The Atlas provides decision-makers, partners, and stakeholders access to relevant information about economic, ecological, and socio-cultural activities occurring in marine spatial planning areas.

#### Canada Marine Planning Atlas

DFO has developed two separate online atlases – one for the Atlantic Coast and one for the Pacific Coast. Both are available on DFO's website to support marine spatial planning and management on their respective coasts. The Atlantic Marine Planning Atlas is a key component of DFO's Marine Spatial Planning Program in DFO Maritimes Region and includes the Scotian Shelf and Bay of Fundy planning area.

The spatial data and information embedded in the Atlas includes data layers on aquaculture, commercial fisheries, bathymetry, important ecological areas, Indigenous communities and boundaries, marine spatial planning areas and bioregions, marine transportation, protected and conservation areas, species at risk, and electronic navigational charts produced by the Canadian Hydrographic Service. Many more data layers are available by using the "add data" function to access additional data records published on Canada's Open Data Portal. The available data layers on the Atlas are also grouped according to the following source categories: Ecosystem and Ocean Knowledge; Boundaries and Management Areas; Local, Socio-cultural and Traditional Knowledge; Human Use; and Synthesis Areas.

End-users of the Atlas include marine spatial planning staff and decision-makers in federal, provincial, and municipal government departments, and Indigenous communities and organizations. The Atlas should also be of interest to academics, private-sector companies including industry and consultants, public educational institutions, environmental non-governmental organizations, research institutions, and the public.

The Atlas allows users to discover, view, interact with, and download spatial data relevant to marine spatial planning. It serves to:

- Advance federal priorities for open access to marine information and data.
- Increase transparency in decision-making and collaborative planning processes while supporting decisions and planning for users regarding human activities and conservation.
- Report on the outcomes of the MSP Program to Canadians.

In addition, the Atlas can:

- Support conflict resolution and consultation by identifying overlapping interests, activities, and sensitive areas.
- Identify information gaps to improve planning for current and future issues.
- Allow for collaboration to reduce duplication of efforts.
- Provide information to monitor and measure achievement of MSP objectives.
- Advance collaboration with Indigenous peoples through their involvement in MSP.

While the Canada Marine Planning Atlas is not an advanced GIS tool, its data layers can be downloaded and used outside of the Atlas for other purposes (e.g., evaluating economic development and marine conservation scenarios, or multi-sectoral use analyses).

#### 4. Objectives

The spatial distribution and intensity of human uses and ecological data at relevant planning scales have many applications, including:

- Identifying, assessing and mitigating human use conflicts and constraints
- Informing federal and provincial environmental assessment processes
- Conducting use intensity and cumulative impact assessments
- Providing information and advice for regional fisheries assessments, Integrated Fisheries Management Plans, and Marine Stewardship Council eco-certification processes
- Informing risk assessments for *Species at Risk* Act-listed species, Marine Protected Areas and marine refuges
- Informing environmental preparedness, response, and recovery operations

#### Canada Marine Planning Atlas: future considerations

DFO is currently gathering public user feedback on how to enhance the initial, fully functional version 1.0 of the Canada Marine Planning Atlas launched as a prototype in the winter of 2023. Users of the Atlas are encouraged to test the core functionalities, including data visualization, printing, bookmarking, measurement and drawing tools, and the use of the build report function to summarize data layers in a user-defined area. Version 2.0 of the Marine Planning Atlas application is being planned to be more user-friendly, intuitive, and with several data gaps filled. The Marine Planning Atlas is intended to be a discovery tool for available marine spatial data across federal and provincial government departments. If you have data layers to make publicly available, contact: [DFO.MSDI-IDSM.MPO@dfo-mpo.gc.ca](mailto:DFO.MSDI-IDSM.MPO@dfo-mpo.gc.ca). For technical issues, contact: [DFO.FIMTSGISINFO-GISTSIGINFOF.MPO@dfo-mpo.gc.ca](mailto:DFO.FIMTSGISINFO-GISTSIGINFOF.MPO@dfo-mpo.gc.ca).

### Marine Planning and Conservation tools

#### Strategic Ecosystem/Activity Compatibility Assessment Tool

The Strategic Ecosystem/Activity Compatibility Assessment Tool (SEACAT) is a high-level examination of the planning area to assess the potential sensitivity of ecosystem components (e.g., fishes, invertebrates, biogenic habitats, migratory birds, etc.) to various human activities. This tool will have multiple outputs, including an interaction matrix of human activities and ecosystem components, a document describing potential interactions/sensitivity based on the current literature, and an interactive tool that biologists can use to query results for specific activities and/or ecosystem components. Assessing the compatibility of human activities with varying ecosystem components is an essential aspect of marine spatial planning with a wide range of applications, from risk assessments for AOIs and/or MPAs, to new developments, to sector expansion plans. In addition, a tool that can be queried will ensure consistency and prevent duplication of efforts across projects.

#### Ocean Use Compatibility Analysis

The Ocean Use Compatibility Analysis (OUCA) is a tool used to characterize human activities in the marine environment and evaluate the potential compatibility between them (Serdynska *et al.* 2024). This tool was originally developed for MSP processes for several countries in the European Union and has been modified to encompass the human activities that occur in the current planning area of the Scotian Shelf and Bay of Fundy. Each activity is scored on size, time, mobility, and the activity's location in the water column (i.e., surface, mid-water, and bottom). Once all the activities are scored, the scores are combined across activities to create a compatibility rating between them. The compatibility scores are averages using available data. They provide a high-level first look at the potential compatibility between activities and do not consider any management or mitigation of activities that might make them more compatible. This decision-support tool may be used to assess potential conflicts between human uses of marine spaces (e.g., fishing, aquaculture, oil and gas, etc.) to inform sector-based planning.

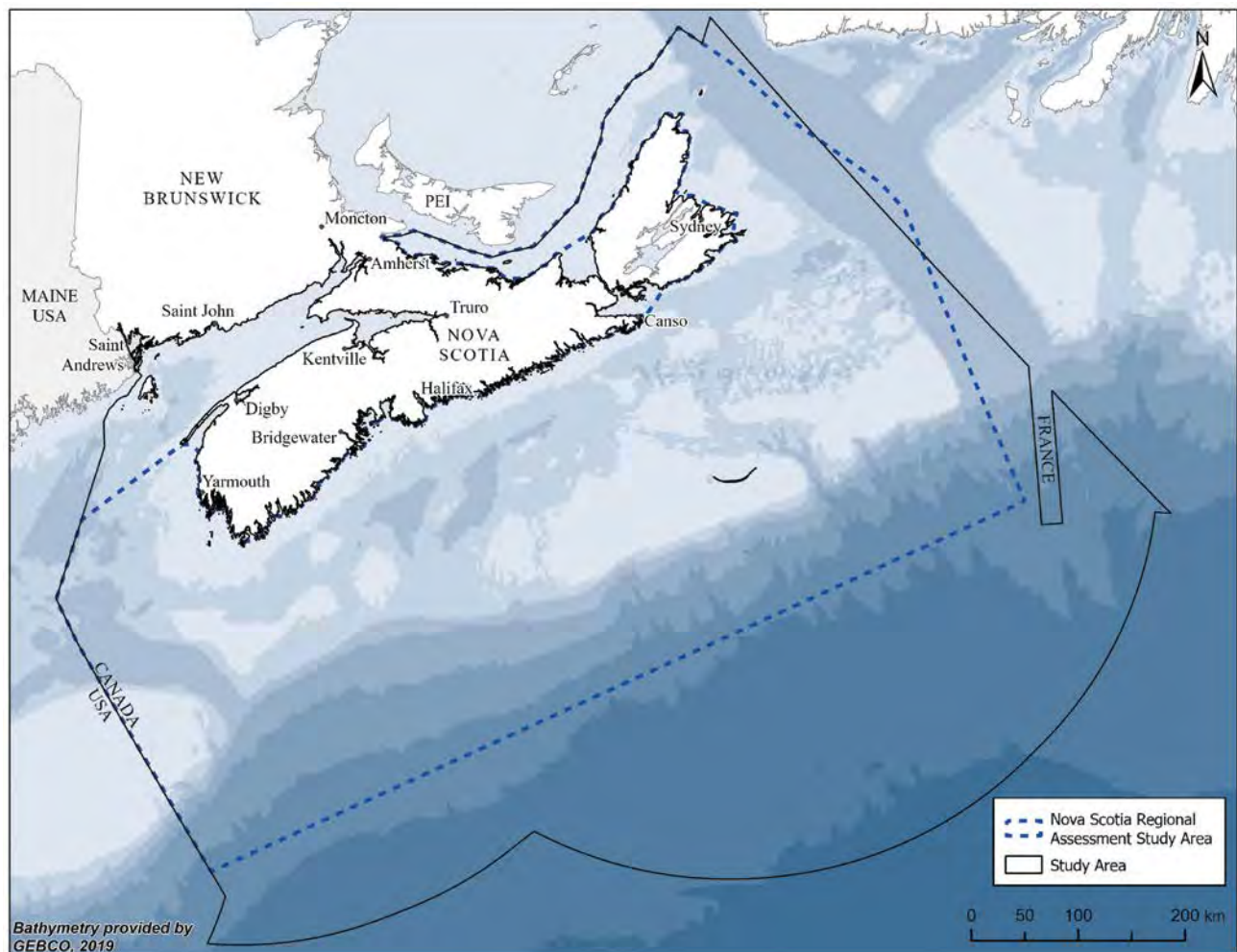
#### 4. Objectives

##### Marxan with Zones offshore wind analysis

Offshore wind energy (OWE) is a newly considered ocean activity that has high potential to provide renewable energy. OWE could also affect ocean uses and marine life and habitats. Through this project, DFO is creating a decision-support tool to help locate potentially suitable areas for OWE sites which avoid conflict with existing uses and ecological features (Nagel *et al.* 2024). This tool will not decide where OWE will be located. Rather, this tool will provide information to support decision-making and planning and demonstrate how multiple objectives can be considered when planning how to use ocean space. This project aims to develop a long term, repeatable, and transparent decision-support tool for marine spatial planning that can aid regulators and decision makers during the site identification process for new ocean activities such as OWE.

This analysis uses available data on OWE suitability such as water depth, wind speed, sea ice, surficial geology, and distance to shore, using information from NRCan (Kilpatrick *et al.* 2023). Activities occurring in the study area were assessed including commercial fishing, marine transportation, and marine conservation. By visualizing the areas that are already in use, areas can be identified where OWE could take place to minimize overlap with these uses. Over time, as project proposals are put forward, understanding of potential impacts can be improved by determining the spatial extent of economically viable areas for OWE while also minimizing overlap with other human uses and ecological features.

The project study area will cover the Scotian Shelf and Bay of Fundy planning area and part of the Estuary and Gulf of St. Lawrence planning area. This area includes that of the Regional Assessment of offshore wind development in Nova Scotia, as well as the Bay of Fundy and coastal areas (Figure 13).



**FIGURE 13** Study area for the offshore wind spatial analysis project (Nagel *et al.* 2024).





This project used the software ‘Marxan with Zones’. This software was used during the development process for the marine conservation network plan in the Scotian Shelf and Bay of Fundy bioregion. Results from the first phase of this project are intended to provide information to support future research and do not constitute Government of Canada direction on where OWE should or should not be located. Data for the first phase of this project includes regional or interregional-scale information from DFO and other government departments. Later applications of the tool can incorporate other information and data as the tool is flexible and can be adapted to address other MSP questions.

Results include maps identifying locations with a higher or lower likelihood of overlap between OWE and human uses, ecological features, and protected areas. As part of the project, a technical report describing the first phase of the project was submitted to the committee carrying out the Nova Scotia Regional Assessment to help inform the committee’s recommendations about future OWE.

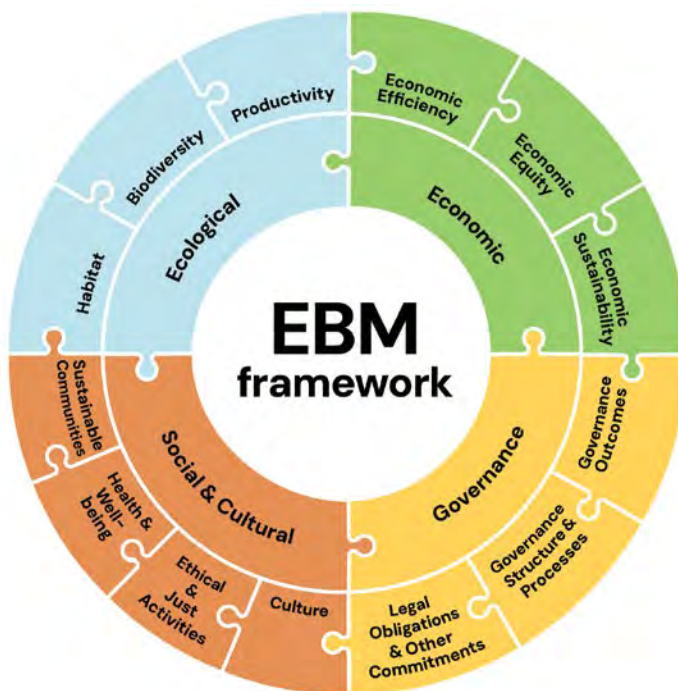
### DFO Maritimes Ecosystem-Based Management Framework

EBM is an interdisciplinary approach that explicitly considers ecological, economic, social, and governance objectives to achieve sustainable resource use at appropriate temporal and spatial scales. EBM recognizes the interconnected nature of social-ecological systems and considers human activities and environmental stewardship in a multiple-use context (Smith

*et al.* 2017). EBM requires integrated consideration of objectives in advice and management, which differs from current approaches to management where these considerations are usually treated separately in different processes and in different ways (Stephenson *et al.* 2019).

EBM is widely recognized as a best practice for managing multiple ocean uses and their associated ocean-use sectors (Link and Browman 2017; McLeod and Leslie 2009). EBM facilitates sustainable and resilient ecosystems that account for both good environmental health and human wellbeing (Millennium Ecosystem Assessment (Program) 2005, Ban *et al.* 2019).

Canada aspires to achieve sustainable development and management of its ocean and freshwater systems supported through DFO’s broad mandate to take an ecosystem approach to fisheries and oceans management (Government of Canada 1985, 1996; Rudd *et al.* 2019; Link 2017). To promote and facilitate operationalizing EBM in Canada, a Version 1.0 EBM Framework has been developed by DFO Maritimes Region (Bundy *et al.* in prep 2021, Daly *et al.* 2020). The EBM Framework is composed of four pillars: ecological, economic, social/cultural, and governance (Figure 14).



**FIGURE 14** The four pillars and main objectives of the DFO Maritimes Region Ecosystem Based Management Framework.

The Maritimes EBM Framework is intended as a tool to support decision-making across sectors by providing a broad range of objectives within a consistent, structured framework for transparent, evidence-based decision-making. The newly developed Maritimes EBM Framework builds on an earlier DFO Ecosystem Approach to Management (EAM) Framework (Curran *et al.* 2012, Gavaris 2009) and the Sustainability Framework developed by the Canadian Fisheries Research Network (CFRN) (Stephenson *et al.* 2018, 2019). Potential applications for the Maritimes EBM Framework include conservation network planning and MPA designation, fisheries management plans, and MSP.

The DFO Maritimes EBM Framework describes a comprehensive suite of core objectives or values for EBM, based on Canadian policies, DFO policies, and international agreements. It is designed to be relevant and applicable across DFO to support decision making by offering a consistent and structured way to assess the cumulative impacts of human activities. It provides a baseline structure and process designed to consider long-term cumulative impacts on ecosystem sustainability. This framework's unique strength will come from the consideration of management issues and problems across the ecological, economic, social/cultural and governance pillars and objectives. It will be useful in developing advice that considers a more complete understanding of potential management scenarios, particularly the social and cultural contexts, including the identification and quantification of trade-offs. The EBM Framework can be used to support MSP related decision-making in several ways (Stephenson *et al.* 2018):

- To evaluate the scope of existing management approaches and plans to achieve MSP objectives
- As a checklist of objectives (Ecological, Economic, Social & Cultural and Governance)
- As a basis for scenario comparison
- As a management report card to enable adaptive management
- As the basis to assess cumulative impacts and evaluate trade-offs

## DFO Science tools

### Open Government data publications

Significant efforts are being made to publish various DFO-derived datasets in the [Open Government Portal](#). To date, over 120 different datasets related to MSP have been published related to the ecology and human uses in the planning area. This work will be ongoing and will support more open, transparent, and timely planning and decision-making by a wide range of end users.

### National Eelgrass Task (NET) Force eelgrass mapping

Eelgrass is an important component of the coastal ecosystem found along the Atlantic Coast in sheltered bays and coastal waters. The most common species in the inshore region is *Zostera marina*. Eelgrass is recognized as an ecologically significant species because it provides several critical ecosystem services and functions, including habitat structure, high primary production, sediment stabilization, and a complex habitat that supports high abundance and biodiversity of different fish and invertebrate species. The loss of eelgrass has been observed worldwide, approximately 20 percent since 1880 (Dunic *et al.* 2021), and is particularly associated with anthropogenic stressors in areas with large human populations. In Eastern Canada, eelgrass often constitutes a dominant habitat feature and can have measurable influence on the overall ecology of adjacent marine ecosystems (DFO 2009). The ecological consequences of the loss of eelgrass would be greater than an equal loss of most other species associated with this ecosystem (DFO 2009).

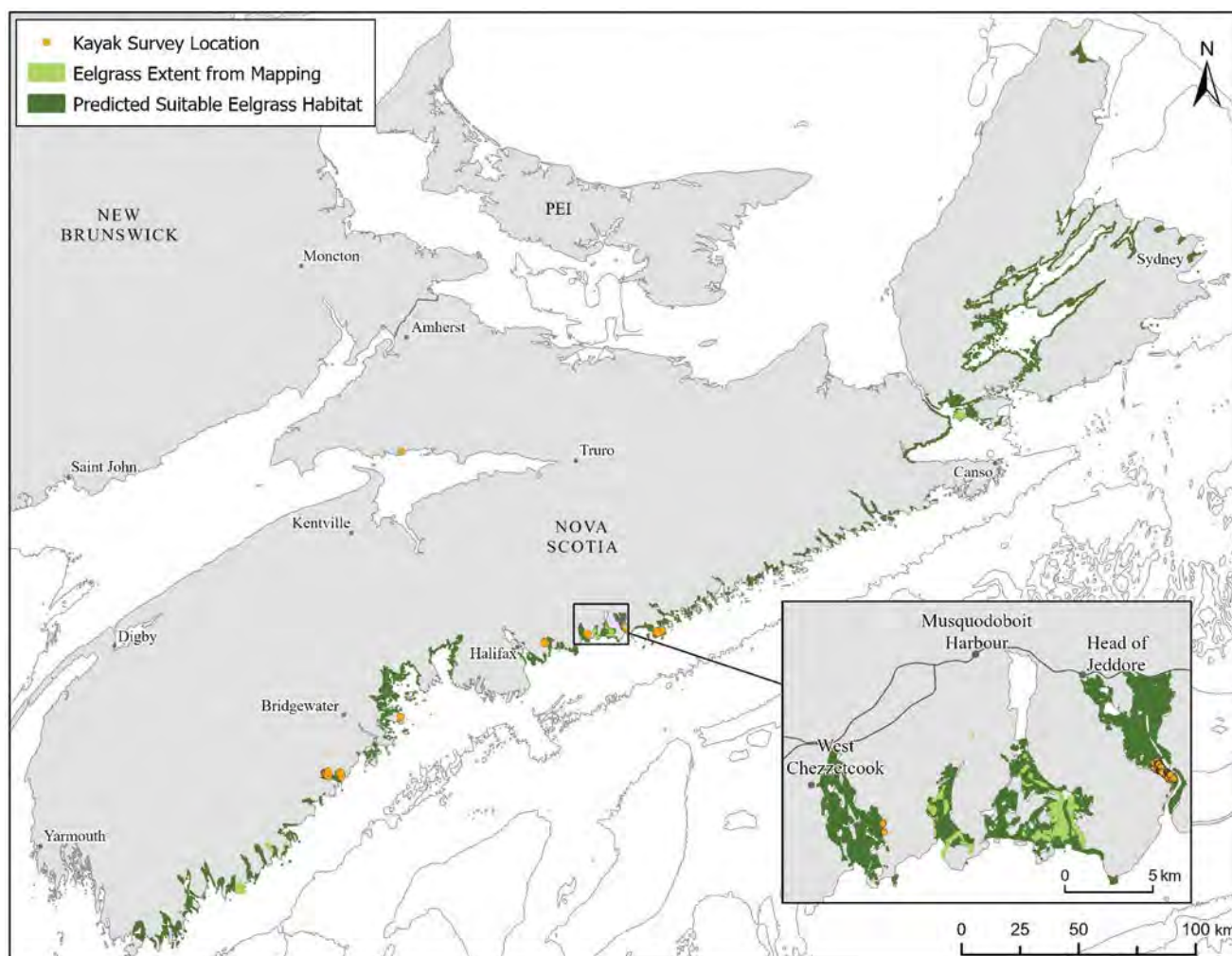
Eelgrass in Eastern Canada occurs commonly in sheltered, intertidal and shallow sub-tidal ecosystems, forming patchy or continuous meadows. The ability to detect eelgrass can be influenced by various environmental conditions (e.g., water clarity, tidal height, season). Knowledge of eelgrass distribution to date is underestimated as it relies on site-specific data obtained from satellite imagery, aerial photos and surveys, benthic sonar, visual surveys, and local knowledge. Many areas of shoreline have not been surveyed, and field data can be several decades old. Baseline data on the distribution and condition of eelgrass relevant for decision-making processes (e.g., conservation planning) is limited in coastal Nova Scotia.

#### 4. Objectives

DFO Science is working to compile available eelgrass spatial data to provide an improved estimate of eelgrass coverage. Species Distribution Models (SDMs) have been developed to predict eelgrass presence/absence along the Nova Scotia coast based on three simple environmental predictors; sediment type, depth, and exposure. SDMs are being further refined to allow prediction of eelgrass biomass and percent cover (metrics which reveal aspects of ecosystem functioning). This project balances ongoing work to determine the cumulative impacts of human activities on coastal ecosystems in the Maritimes Region including specific work to develop a human impact metric

of stress to identify eelgrass meadows at risk due to cumulative impacts from human activities.

The MSP Program will also leverage a national eelgrass map that is being produced by the National Eelgrass Task Force project (DFO 2023a; Guijarro-Sabaniel *et al.* 2024). This project consists of a diverse partnership of scientists, managers, and partners with a collective interest in achieving a comprehensive eelgrass map for Canada (Figure 15). A publicly available [National Eelgrass Dataset](#) is available which consolidates past and current coastal mapping initiatives across Canada into a single product.



**FIGURE 15** Observed and predicted eelgrass extent from surveys, mapping, and modeling.

Kayak survey data were provided by the Ecology Action Center (EAC) and were completed by citizen scientists. Data from mapping includes data from satellite, aerial and drone imagery, and lidar. The submerged Aquatic Vegetation (SAV) data layer from satellite images in the Eastern Shore Islands is not shown in the map as it does not distinguish between eelgrass and other aquatic vegetation. (DFO 2023b).



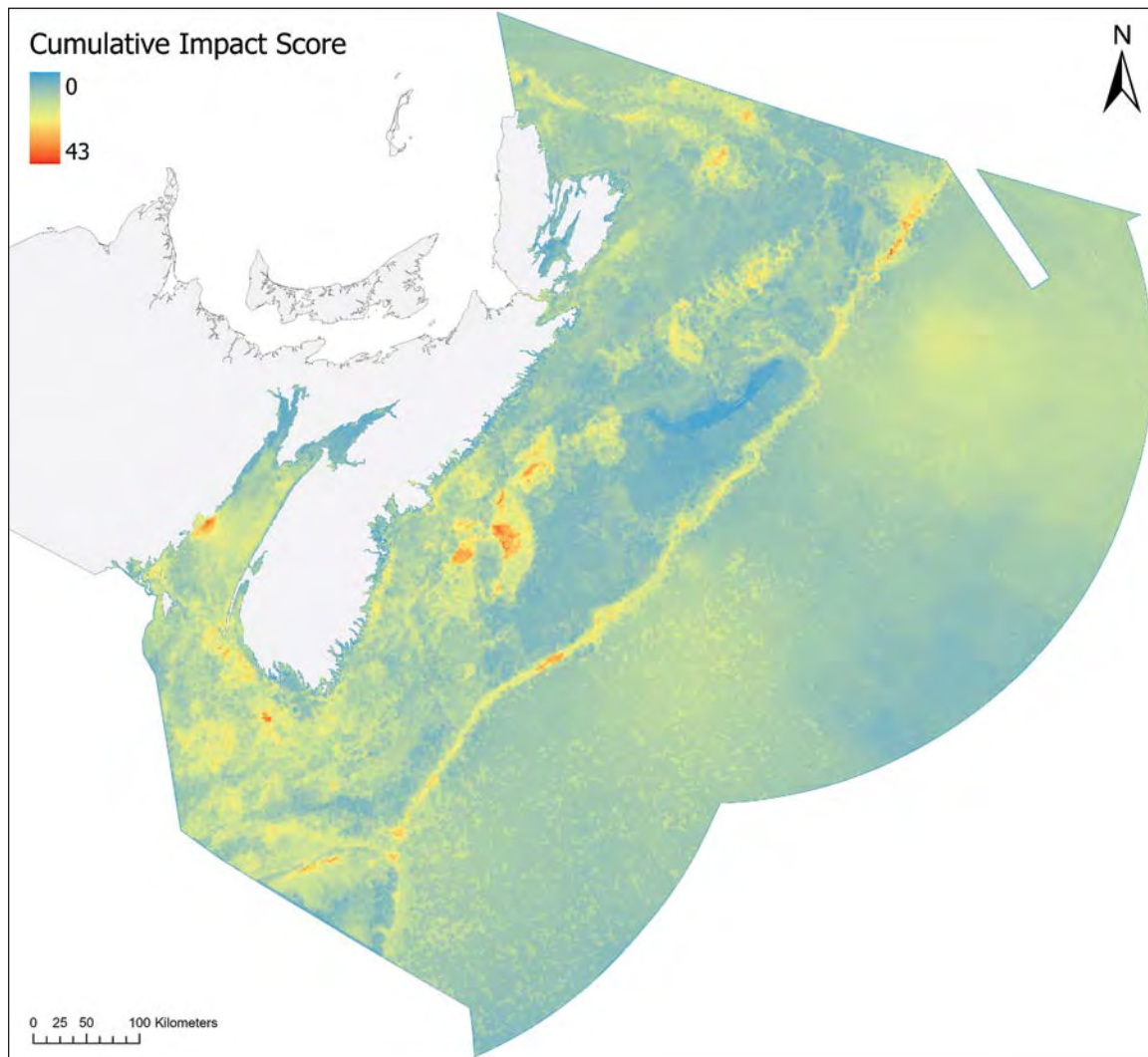
#### 4. Objectives

As an ecologically significant species sensitive to human activities, current and reliable knowledge on eelgrass presence and absence can provide critical information to managers, scientists, and the public that inform decision-making for a variety of applications related to marine spatial planning, including, but not limited to, project reviews, monitoring, conservation planning, emergency response, and restoration.

##### **Cumulative Impact Mapping**

The development of a cumulative impacts map (Figure 16) is an integral component to marine spatial planning processes, and the development of comprehensive future marine spatial plans by identifying potential hotspots of overlapping human activities and resultant potential ecological effects. In support of the MSP Program, DFO

Science has assembled available information on human use activities in coastal and offshore environments to create an inventory of potential anthropogenic stressors on the marine environment (Murphy and Kelly 2023). This information was combined with available data on the locations of benthic, pelagic, and biogenic habitats and their estimated vulnerabilities to ecosystem stressors to create a cumulative impact map for the Maritimes Region. This method can be used to identify areas of high or low human influence (i.e., hot-spots and cold-spots) and the potential spatial extent of cumulative impacts from human activities on Maritimes Region marine habitats. This process also works to further identify gaps in knowledge and areas that lack high quality data to direct future work.



**FIGURE 16** Map of cumulative impact scores for Maritimes Region (Murphy and Kelly 2023).

The cumulative impact mapping tool can be refined and updated as data collection continues to validate existing geospatial data layers, understand interactions, and as additional human activity-stressor data sources are updated or added. The development and continued advancement of cumulative impacts maps across marine environments can be a key component for planning and informing ecosystem-based management decisions. For example, these maps can illustrate areas of relative impact for protection or restoration, identify impact by specific human activities, or compare current vs. future scenarios of relative impact, including from global stressors such as climate change.

### **Reproducible Reporting Tool**

Work within DFO Science spans a range of diverse topics and operations and is becoming increasingly interdisciplinary and technology driven. As science becomes more data-intensive, the amount of available information and data has grown rapidly, leading researchers and data users to develop new methods to summarize and share material. As requests for information and advice based on available DFO and non-DFO datasets becomes more frequent, multiple challenges arise such as limited access to data, time-intensive and repetitive requests, individual workloads, duplication of effort, and lack of transparency and reproducibility. Data can be stored in multiple locations, therefore, individuals looking for information may not be aware that particular data exists. Projects and decisions within DFO can be complex, resource-intensive, and sometimes controversial, which heightens the need for an efficient, transparent, and reproducible solution to responding to data and information requests.

The science-based Spatial Reproducible Reporting Tool aims to develop a web-based and open-source report that identifies and describes DFO and non-DFO datasets within a user-defined spatial area based on consistent, transparent, and updateable processes (Stoyel *et al.* 2022). Specifically, this Reproducible Reporting Tool can address internal requests to provide frequent and standardized advice for processes such as the Canadian Science Advisory Secretariat (CSAS), aquaculture siting responses, Environmental Response, and other project reviews. In many cases, requests for information will focus on highly vulnerable species and ecosystems, such as species at risk, the presence of important areas (e.g., MPAs or EBSAs), and/or species observations.

The MSP Program has supported this initiative which began by developing a comprehensive inventory of scientific spatial data, both internal and external to DFO, including the identification of available baseline data, knowledge products (e.g., maps), tools, and identifying data priorities and gaps (Stoyel *et al.* 2022). This process makes data more accessible and encourages collaboration, sharing, and publication of open-source data to the Open Government Platform (code is also publicly available on [GitHub](#)). The review of applications for proposed and amended marine finfish aquaculture sites was an early motivation for this tool. Other applications include providing information on environmental sensitivities during emergency responses (e.g., a fuel oil spill) and conservation network planning. This tool is also being advanced for the likelihood of future requests related to offshore wind projects. Reports can now be developed in minutes instead of days or weeks, resulting in large reductions in the time and resources that are needed to acquire and manipulate information for review.

### **Climate change adaptation tools**

A series of MSP decision-support tools have been developed to prepare for and adapt to the impacts of climate change including its impacts on infrastructure. DFO is responsible for maintaining over 1,000 small craft harbours across the country, which support nearly 90 percent of all fish landings in Canada in addition to recreational activities. These coastal assets, and associated operations, are susceptible to the predicted impacts of climate change and in total, include nearly 6,000 structures valued at \$2.1 billion.

The *Coastal Infrastructure Vulnerability Index (CIVI)* tool was developed for DFO use only but is national in scope (Greenan *et al.* 2018). The CIVI provides a numerical calculation to indicate the relative vulnerability of a small craft harbour to the effects of climate change. The CIVI was designed based on three primary components which include exposure (e.g., natural forces), infrastructure, and socioeconomics (Greenan *et al.* 2018). Each component was based on three to five variables and scored on a scale of 1 to 5 (not vulnerable to highly vulnerable). The Exposure Sub-Index includes five component variables: relative sea level change, maximum wind speed, maximum significant wave height, coastal materials, and change in sea ice duration. The Infrastructure Sub-Index includes

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three component variables: harbour condition, total harbour replacement cost, and degree of facility protection. The Socio-Economic Sub-Index is also composed of three component variables: average landed quantity per average number of vessels at the harbour, average fishing income to average employment income, and total population. These scores were then incorporated into a final Coastal Infrastructure Vulnerability Index for each harbour. For marine spatial planning decision-making, end users can access CIVI to enable the Department's Small Craft Harbours Program to assess the vulnerability of coastal sites to sea-level change.

As the Government of Canada works to prepare for and adapt to the impacts of climate change for federal facilities and operations, DFO Real Property and Science have guided the expansion of CIVI to tailor requirements to similarly assess infrastructure managed by the Government of Canada's Real Property Services. This marine spatial planning decision-support tool is called the *Climate Change Vulnerability Evaluation* (CCVE). The tool started with a pilot study for a subset of Real Property locations, including both coastal and inland locations. It is intended for DFO use and is national in scope to help inform decisions related to capital investments in DFO infrastructure.

Last, the *Canadian Extreme Water Level Adaptation Tool* (CAN-EWLAT) is a MSP decision-support tool open to the public and used by DFO Small Craft Harbours to incorporate climate change considerations into the planning process. This tool considers science-based models and information on projected sea level rise to provide advice on how much higher to build harbour infrastructure (e.g., wharves, breakwaters) to accommodate sea level rise over the infrastructure lifetime. Although developed primarily for DFO small craft harbour locations, the CAN-EWLAT can provide useful information for a diverse range of coastal users and planners with infrastructure along Canada's ocean coastlines, including, but not limited to citizens, government agencies, private sector, and engineering firms designing coastal infrastructure.

### Other federal tools

#### Marine Cadastre

The MSP Program has been participating in efforts led by NRCan's Surveyor General Branch and DFO's Canadian Hydrographic Service to establish a source of authoritative or legally defined boundaries into a Marine Cadastre as part of a broader goal of advancing marine spatial governance. The Marine Cadastre is a federal tool that will allow for the systematic public recording of all recognized legal rights, responsibilities, and restrictions related to the ocean space. To create this tool, a federal workshop series on Marine Spatial Governance took place from Fall 2021 to Spring 2022 and included participants from 18 federal departments and agencies. The objectives of the workshops were to gain a better understanding of departmental activities and challenges in the ocean space, build justification for renewing Canada's marine regulatory framework, and develop a common vision for a renewed marine regulatory framework.

#### Marine Spatial Data Infrastructure and Federal Geospatial Platform

The Marine Spatial Data Infrastructure (MSDI) and the Federal Geospatial Platform (FGP) are two other tools being used by federal departments to share data and mapping products internally, which supports the mapping of coastal and offshore human uses and ecological features across the planning area. For example, under its MSP commitments, NRCan is compiling existing seabed data to develop detailed seafloor geoscience maps that are available internally through the MSDI and FGP, and externally through the Open Maps and Open Data Platforms. ECCC will be compiling data products related to their mandate for migratory birds, species at risk and their habitats, and areas of risk to birds that support marine conservation planning targets within the MPC Program. These data will also be made available via Canada's Open Data Platform and within the Marine Planning Atlas.



### Open Science and Data Platform

The Open Science and Data Platform provides access to science, data, publications, and information about development activities across the country that can be used to understand the cumulative impacts of human activities to support better decisions in the future. The goals are:

- To provide access to data, scientific publications, and information about natural resource development activities in Canada.
- To help Canadians learn about cumulative impacts in their communities.
- To support impact and cumulative impacts assessments.

Following a comprehensive review of federal environmental and regulatory processes in 2016, the Government of Canada proposed an Open Science and Data Platform to access and integrate the available science, evidence, and Indigenous Knowledge that supports these important processes. Launched in 2021 and co-led by NRCan and ECCC, the Open Science and Data Platform provides Canadians with a single point of access to authoritative scientific publications, geospatial data, and regulatory information which can provide useful information in the understanding of cumulative impacts and development activities across Canada. As an information-sharing platform, which aggregates contributions from federal, provincial, and territorial systems, it offers curated content including thematic and regional collections allowing users to easily access relevant content for many areas of interest. Users can layer datasets in the Platform's map viewer which provides a comprehensive picture of cumulative impacts at a regional scale.

## 4.6 Coordinate and streamline decision-making

As coastal and marine activities are regulated by a number of government departments, it is important to ensure appropriate and effective decision-making within and across authorities, departments, and jurisdictions. Therefore, a primary focus of the Marine Spatial Plan is on enhancing marine management through improved decision-

making by both government departments and marine users. One way this will be accomplished is through the provision of timely and accessible information, and the use of decision-support tools as described in Section 4.5, including the Canada Marine Planning Atlas.

### Research on advice and decision-making in DFO Maritimes Region

Staff from DFO Maritimes Region frequently engage in decision-making processes as part of their regulatory responsibilities in addition to providing advice internally and to external partners (including the public, other federal departments, provinces, ENGOs, industry, and others). In 2020, a research project through Dalhousie University offered recommendations for improving the advisory and decision-making processes of several DFO programs based on staff interviews and content analysis. Several recommendations emerged from this research, including:

- Governance and engagement processes with First Nations and the provinces could be improved and made consistent across programs.
- More guidance on the inclusion of Indigenous Knowledge in advice and decision-making is needed.
- More staff are needed to increase program capacity and manage workloads.
- Cumulative impacts need to be better defined and assessed within the Department.
- More data collection and more accessible data would benefit decision-making and advice (e.g., for species at risk and habitat, aquatic invasive species, freshwater fish and fish habitat, and human uses).

This research helps us understand how and where marine spatial planning can support decision-making and internal operations.

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To compliment these efforts, the MSP Program will explore opportunities to help coordinate and streamline decision-making processes through enhanced engagement, participation, and collaboration among various users and the participating government departments. Efforts will be made to

identify efficiencies, including through the examination of existing regulatory and decision-making processes. One example has been the Argyle Aquaculture Development Area (ADA) process in Southwest Nova Scotia.

##### **Argyle Aquaculture Development Area (ADA) process**

The Argyle ADA process began in November 2019 as a partnership between the Municipality of Argyle (located in Yarmouth County, Nova Scotia) and the Nova Scotia Department of Fisheries and Aquaculture (NSDFA). DFO was asked by NSDFA to participate in the initiative in 2020 where the main objectives were to secure suitable marine locations for aquaculture development (only marine plants and shellfish) based on social, environmental, and economic data; minimize conflict between aquaculture activities, social users, and ecological functions; streamline regulatory processes; and reduce costs and minimize financial risk. NSDFA has led on the overall coordination, the data analysis and decision-support work, engagement with other government departments, and Indigenous consultation. The municipality has led on stakeholder engagement, and the Centre for Marine Applied Research (CMAR) has developed a GIS-based decision-support tool to find areas most suitable for shellfish and marine plant aquaculture within the broader area of analysis. Staff from DFO's Aquaculture Management Program (AMP) and the Marine Planning and Conservation Program provided subject matter expertise and participated in both the Steering and the Data Committees.

On April 15, 2024, the Argyle Aquaculture Development Area was formally designated. Fifty three sites within Lobster Bay and Pubnico Harbour have been screened as being suitable for marine plant and shellfish aquaculture. The ADA will be developed in phases starting with a call for proposals for six sites. Each of these pre-approved areas for farming help streamline the licence and lease application process and saves time and resources for sea farmers. This in turn provides greater certainty and support for the growth of this marine use for the coastal communities located there. While the NSDFA and planning partners will regularly assess the process and make adjustments as needed, these efforts represent a good example of how governments can work together to streamline decision-making processes.

### 4.7 Seek policy and legislative improvements

Like efforts to seek more coordinated and streamlined decision-making processes, the MSP Program will also explore opportunities to make policy and legislative improvements as they affect various aspects of marine management. DFO has undertaken a review of its relevant legislation in terms of MSP and will also work with other government partners to do so as needed. It is anticipated that as partners are further engaged in the MSP process, and information is shared about areas of mutual interest, policy and legislative improvements will be further identified and explored.

### 4.8 Understand and consider cumulative impacts

Cumulative impacts are the successive, incremental, or combined impacts of one or more human activities on valued ecosystem components such as species or habitats. As human uses of marine ecosystems increase, the recognized importance of understanding and accounting for cumulative impacts continues to grow. Interactions among stressors leading to cumulative impacts can be complex. While our understanding of these interactions and our ability to model them is presently imperfect, the field continues to advance.

In recent years, cumulative impact mapping (CIM) has emerged as a promising management tool to better account for, and estimate, the impacts of stressors caused by multiple human activities in marine systems. (see [DFO science tools](#), page 41). CIM combines knowledge of the location and intensity of human activities and species or habitats with estimates of the ecological vulnerability of those species or habitats to human activities or stressors, into a single, comparable, relative cumulative impact score. While this method is highly dependent on data quality and quantity, its simplified metric can be used to evaluate potential impacts on valued ecosystem components that can more easily be communicated for management decisions.

CIM represents the current approach and results for better understanding these interactions and providing support for decisions associated with them by both users and regulators. Work in this area and its application to planning and decision-making will be ongoing with all departments.

### 4.9 Provide timely and accessible information

MSP strives to consider all activities and partners in an area to help make informed decisions about ocean space management. To this end, a range of data sources will be relevant to advancing MSP, many of which are held by participants outside of DFO. The MSP Program aims to provide timely and accessible information by enhancing connections between these data holders to support effective and transparent decision-making.

Data sharing is the ability to share the same data resources for multiple applications with many ocean users. It implies that data are stored in one or more servers in a network and multiple applications or users have access to these data. DFO ensures that data being shared for MSP has undergone quality control review, declares the limitations of the data, and does not warrant or guarantee the accuracy, completeness, integrity, or currency of data for any specific use.

Despite commitments to open data and data sharing initiatives, issues with data sharing are common and include limited human resources to identify and acquire relevant data, data quality and accuracy, and variations in metadata standards. Technological advances in GIS mapping have helped to resolve some challenges with mapping sensitive marine data and information to make privacy-screened data sharable.

Many atlases, platforms or data portals exist to support technological developments for data sharing and the trend is towards open data. Examples of open data sites include:

- Open Science and Data Platform: <https://osdp-psdo.canada.ca/dp/en>
- Open Data: <https://open.canada.ca/en/open-data>



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- Canadian Integrated Ocean Observing System (CIOOS) Atlantic: <https://cioosatantic.ca/>
- Nova Scotia Open Data: <https://data.novascotia.ca/>
- Open Data New Brunswick: <https://gnb.socrata.com/>

Data publication to the Open Data and Open Maps portals is an ongoing activity to ensure that all data are shared with the public and government regulators. Where data are not publicly available through open data sites, DFO will consider entering into data sharing agreements with external parties.

To answer key marine planning-related questions, MSP relies on diverse types of spatial and temporal data, information, and diverse types of knowledge (e.g., experiential knowledge, Indigenous knowledge, and local coastal community knowledge). The product of data and information analysis and synthesis results in “knowledge products”. An example of a future knowledge product could be a commercial-use density map (or maps) based on vessel traffic density, fishing intensity, aquaculture sites, offshore petroleum energy areas, or renewable energy areas.

Knowledge products with consistent data sources, standards, and methods will support effective and informed decision-making. The MSP Program will strive to develop a range of knowledge products which may include maps of:

- Important ecological areas and/or the conservation network plan
- Cumulative impact scores
- Commercial use density
- Recreational, social, or cultural use density

While knowledge products will be developed regionally, the approach will be developed collaboratively at a national level to ensure inter-regional consistency (e.g., common definitions and interpretations, interoperable data formats and metrics). Feedback for knowledge product development will be ongoing.

## 4.10 Ensure effective participation

DFO Maritimes Region is adopting a participatory approach to MSP. Meaningful and effective participation for MSP is needed internally within government and externally between governments, rights holders, and stakeholders through existing and perhaps new governance structures. International guidance on MSP indicates that the adoption of efficient and transparent participatory approaches across government bodies, sectors, and other groups (horizontal integration) as well as between government levels (i.e., vertical integration) are crucial for marine spatial planning processes (UNESCO-IOC/European Commission 2021). Effective participation throughout the planning process will ensure that the interests of key ocean user groups are identified and prioritized in the Plan. This approach includes developing governance bodies to support participation, creating spaces for effective engagement of participants, and helping enhance the capacity of Indigenous organizations and First Nations to engage in MSP.

Regional governance structures for MSP have been developed internally at the federal level (including NRCan, TC, ECCC, and IAAC), between federal and provincial bodies (including the Governments of Nova Scotia and New Brunswick), and between federal bodies and Indigenous organizations (including Kwiilmu'kw Maw-klusuaqn and Wolastoqey Nation in New Brunswick). Engagement of federal partners, the Provinces, as well as Indigenous organizations and First Nations is ongoing. As MSP advances in the planning area, existing governance models may evolve to better support effective participation among the authorities and rights holders.

DFO's Grants and Contributions (G&C) program has offered multi-year funding to Indigenous organizations to support capacity enhancement and community engagement on ocean management topics, such as MSP. Through signed Contribution Agreements, various Indigenous organizations have received funding to participate in MSP allowing them to hire dedicated coordinators, and engage in discussions with their community members, DFO, and others. Additional support has been provided to other organizations to also participate meaningfully in the MSP process.



### 4.11 Improve communications

Improved communications is an important objective of MSP engagement efforts and overall Plan delivery. Effective communication of MSP will lead to a better understanding of MSP goals and objectives amongst both planning partners and the Canadian public, contributing to a stronger planning process. Enhanced web presence and the development of communications products such as infographics, fact sheets, and presentations will improve communication of MSP regionally and nationally. The MSP website provides an overview of marine

spatial planning in Canada including governance, science, and knowledge contributing to the planning process and guiding principles from international MSP efforts. Sub-pages on the website provide information on the five planning areas across Canada (including planning area maps). The website will be updated regularly as MSP advances in Canada.

Regional communications products will be developed and distributed to explain MSP in the Maritimes Region.



# 5

## Linkages to other marine initiatives

### 5.1 Blue Economy Strategy

In the 2020 Speech from the Throne, the Government of Canada introduced its plan for economic transformation post-COVID-19 including addressing socio-economic gaps, building a stronger workforce, fighting climate change, and remaining committed to sustainable economic growth (Governor General of Canada 2020). As a key component of this plan, the Government of Canada will develop the Blue Economy Strategy (BES) — a strategic framework to guide future actions and investments into Canada’s ocean economy, while advancing conservation objectives (DFO 2021b). The BES, a national initiative, aims to leverage opportunities on all three coasts and position Canada as an international ocean leader. Canada’s blue economy consists of traditional ocean-based sectors such as commercial fishing, aquaculture, seafood processing, marine shipping, port activities, shipbuilding, and coastal tourism.



It also includes emerging industries and activities such as offshore energy and marine biotechnology. The strategy will drive sustainable economic growth and support the creation of more jobs in coastal and Indigenous communities.

Engagement on the BES was carried out in 2021 and included provincial, territorial, and Indigenous partners and Canadians involved in ocean industries, environmental and social justice initiatives, academia, science, and research and development. Engagement focused on gathering input on how the BES could best support the economic well-being of coastal and Indigenous communities and the sustainable growth of our ocean sectors. Following the engagement process, a “What We Heard” document was written and published in March 2022.<sup>5</sup> Work on the final strategy is ongoing.

### Linkage with MSP

Both MSP and the BES strive to balance human activities and conservation efforts in Canada’s ocean spaces, therefore the BES and MSP are well-positioned to support and advance each other. For example, a BES could examine ways to fill key gaps in ocean science, data, and traditional knowledge to assist MSP processes. A BES could outline a suite of options (e.g., policy and/or legislative) to enhance MSP implementation in Canada so that these processes more effectively support a full range of environmental, economic, and social objectives. Aspects of the MSP Program such as governance, engagement, timely and accessible information, and decision support will provide overarching support to the BES. As part of the engagement for the development of the Blue Economy Strategy, Canadians identified support for MSP and understood that effective spatial planning processes can support our blue economy.

## 5.2 Offshore wind energy

With growing interest in offshore wind energy at both the federal and provincial level, several different initiatives and regulatory regime changes are underway to support the development of this emerging industry.

In early 2023, the Impact Assessment Agency of Canada (IAAC) launched Regional Assessments of offshore wind development in Newfoundland and Labrador and Nova Scotia. Two separate Regional Assessments are being conducted by independent committees within study areas identified for each province. The goal of each Regional Assessment is to provide information and knowledge on offshore wind energy development activities and their potential effects to improve and inform future planning, licensing and impact assessments.<sup>6</sup> Regional Assessment deliverables which will be of particular relevance to MSP in the Maritimes Region include how the findings can inform future planning and licensing and a high-level description of OWE development activities that may occur in the Nova Scotia study area. It is also expected the Regional Assessment will begin the process of identifying general areas for future OWE development, although the process for determining and de-conflicting lease areas is still in development. As OWE is a new industry within the marine environment, these outcomes will constitute important considerations for MSP.

Within NRCan, CanmetENERGY-Ottawa, the Renewable and Electrical Energy Division, and the Geological Survey of Canada have been working together to develop the knowledge base and support regulations and policy related to the development of OWE in Canada. CanmetENERGY-Ottawa is leading a project titled ‘*Renewable resource assessment: wind energy*.’<sup>7</sup> This project includes wind power forecasting, launching the Canadian Wind Turbine Database (CWTDDB) and OWE considerations mapping, among other areas of research. As part of this project, NRCan has also completed a jurisdictional scan of OWE in other countries which reviewed formal administrative processes to define OWE leasing areas and MSP processes in the United Kingdom, Germany, Belgium, Denmark, the Netherlands, and the United States. This report noted that the approaches taken in other jurisdictions can inform the path forward for regulating OWE in Canada and that there are a variety of ways that OWE regulation and the MSP process interconnect. Several marine spatial plans reviewed in the Jurisdictional Scan designate priority areas for OWE.

5 Engaging on Canada’s Blue Economy Strategy: What We Heard. 2022. Available from [Engaging on Canada’s Blue Economy Strategy – What we heard \(dfo-mpo.gc.ca\)](https://engaging-on-canada.ca/blue-economy-strategy-what-we-heard/)

6 Agreement to conduct a Regional Assessment of Offshore Wind Development in Nova Scotia. 2023. Available from: <https://iaac-aeic.gc.ca/050/evaluations/proj/83514?culture=en-CA>

7 Renewable resource assessment: wind energy. 2019. Available from: <https://natural-resources.canada.ca/energy/offices-labs/canmet/ottawa-research-centre/renewable-energy/renewable-resource-assessment-wind-energy/23556>

### Linkage to MSP

DFO will continue to work with NRCan and other MSP partners to understand how marine spatial planning can support proactive, transparent, and evidence-based planning for future OWE. MSP has the potential to enhance planning through supporting coordination between partners, stakeholders, and others in the marine environment. DFO will provide information and advice into the Regional Assessment process on topics related to the department's mandate and priorities including the protection of fish and fish habitat, species at risk, fisheries, marine navigation, and environmental emergency response to ensure that a range of ecological, economic, cultural, and social objectives are considered.

As OWE farms are spatially large and long-term installations, they have the potential to displace other ocean users and affect ecological or conservation features. DFO is applying MSP principles to support improved planning and decision-making by proactively identifying areas which may have less overlap between existing uses and potential future OWE, using similar methodology to what was used for the development of the marine conservation network plan. This analysis uses data from DFO, other federal MSP partner agencies (TC, ECCC, NRCan), as well as the Province of Nova Scotia ([see Marine Planning and Conservation tools, page 38](#)).

The MSP process will also benefit OWE development through:

- Decision support: Decision-support tools will support the proactive identification of potential ocean conflicts at early planning stages.
- Canada Marine Planning Atlas: The Atlas is a publicly available mapping application that will increase the accessibility of ocean-use data and the transparency of decision-making.
- Multi-objective ocean planning: The MSP Program will work collaboratively with partners and stakeholders to understand how multiple objectives can be achieved across ocean sectors.



# 6

## Interests – “What We Heard”

Initial feedback covering this phase of the MSP process is described below. Comments, feedback, and suggestions were gathered through a range of targeted engagement efforts that were aimed at a variety of groups, industries and institutions throughout the summer and fall of 2023 and into the winter of 2024.

Types of engagement efforts included one-on-one meetings with specific sectors, multi-sector workshops (using a mix of online, in-person and hybrid meeting styles), presentations, and post-meeting surveys. Topics raised by multiple groups included the lack of legislative and regulatory authority behind MSP, the need for an integrated approach to management, and the importance of early engagement. At the same time, there was general support for MSP and an interest in seeing it move forward.



Some of the potential benefits or applications for MSP that were commonly identified included supporting decision-making, planning at more localized, community scales, and helping with conservation planning. There was also near-universal interest in more information about many of the decision-support tools. Feedback and interests expressed by specific groups are described. These are not exhaustive and feedback will continue to be collected during subsequent phases of MSP.

### 6.1 First Nations and Indigenous Organizations

Efforts to assess the interests and priorities related to MSP among First Nations and Indigenous communities to date have been pursued largely through a DFO Grants and Contribution funding program. This program was aimed at enhancing the capacity of and support to Indigenous organizations to begin conversations with their members, as well as with DFO and other partners regarding their ocean related interests in MSP. These multi-year agreements were used as a starting point for this dialogue and to help direct future efforts. While not all communities and organizations were able to participate in the first phase of this program, efforts will be ongoing to ensure more comprehensive engagement. Pursuing MSP was seen as a positive development although ongoing discussions will be required. The organizations that were able to participate to date have included:

- Kwilmu'kw maw-klusuaqn – Mi'kmaq Rights Initiative
- Wolastoqey Nation in New Brunswick
- Confederacy of Mainland Mi'kmaq – Mi'kmaw Conservation Group
- Maritime Aboriginal Peoples Council

Some of the priorities identified by these organizations have included:

- Ensuring Aboriginal and treaty rights are understood, respected and upheld
- Indigenous place names
- Marine archaeology
- Indigenous Knowledge and Indigenous governance systems being taken into consideration during decision-making
- Ongoing capacity enhancement and support (including funding support and training)
- Community and youth engagement
- Marine planning and conservation (including Indigenous Protected and Conserved Areas)
- Community-based planning
- Fostering Two-Eyed Seeing (incorporating Indigenous and western knowledge and perspectives)

Aspects that were highlighted as important to the success of MSP included building up relationships, trust, and a shared vision, ensuring early and meaningful engagement and consultation, and taking a holistic, integrated approach to management. Additional interests and priorities will be sought on an ongoing basis within the MSP Program.

### 6.2 Federal government

Federal interests and priorities have been discussed at the Atlantic Coordination Table for MSP (ACT). ACT meetings are held regularly throughout the year and include membership from DFO and the following federal departments, most of which received MSP funding: Natural Resources Canada, Transport Canada, Environment and Climate Change Canada (Canadian Wildlife Service), Parks Canada, Impact Assessment Agency of Canada, and the Atlantic Canada Opportunities Agency. The ACT provides a forum for discussions on national and Atlantic-specific MSP activities. Federal interests for MSP are described, some of which extend beyond this document's current planning area. This section also highlights how MSP is supported by other federal departments with an oceans-related mandate.

### Canadian Wildlife Service

As part of MSP, CWS provides marine bird data and information across Atlantic Canada. CWS ensures appropriate representation of, and access to, marine bird information, develops new data layers, updates existing data layers, works towards estimating risk from marine anthropogenic pressures, and develops integrated, ground-up, evidence-based approaches to implement effective conservation strategies. CWS is also working with Indigenous Nations, including the Nunatsiavut Government, Innu Nation, and the NunatuKavut, Qalipu and Miawpukek Community Councils to enhance local capacity for marine bird monitoring, research, and emergency response as part of the Oceans Protection Plan. Access to data from DFO, the Provincial Governments, and other government departments through the MSP process will provide high-quality information to inform CWS's conservation planning, modelling, and mitigation measures. Information from MSP will help streamline and support the impact assessment process, conservation network planning, coastal planning processes, and the development of ecological monitoring plans.

### Natural Resources Canada

Through the Marine Geoscience for Marine Spatial Planning Program (MGMSPP), NRCan will provide new regional geoscience products (such as maps and analyses of seafloor geology and conditions) to support MSP and its users. As well, NRCan will contribute marine geoscience to regional assessments to ensure that projects proceed with a full understanding of site suitability and potential cumulative impacts. Knowledge and information provided through MSP can support decision-making in offshore natural resource development and seabed infrastructure projects. Furthermore, MSP can help determine whether there is sufficient data to proceed with an assessment, which can lead to a decision being made early in any proposed development stage.

### Parks Canada

Parks Canada is contributing to the establishment and effective management of Canada's MPA network and leading MSP planning within existing MPAs namely for whale habitat conservation in the Saguenay-St. Lawrence Marine Park in a

multi-stakeholder context. Parks Canada is collaborating with Nunatsiavut Government to explore the feasibility of establishing a new National Marine Conservation Area (NMCA) offshore Torngat Mountains in Labrador. Information from MSP can be used to help identify representative marine conservation areas in the Atlantic, on which Parks Canada's NMCA system is based. MSP governance will provide connections with other federal departments, and other jurisdictions involved in establishing MPAs. MSP will support decision-making regarding the establishment and management of MPAs, recovery actions for species at risk, and land-use planning for extractive activities and infrastructure development.

### Transport Canada

There are many TC programs, policies, initiatives, and priorities that will contribute expertise, information, knowledge, or data to the marine spatial planning process. As administrator of Canada's marine safety system, TC participation in MSP will ensure the planning process is aligned with the department's legislative and regulatory requirements related to marine shipping. TC is working closely with stakeholders, and Indigenous and local communities on several initiatives under Canada's Oceans Protection Plan 2.0. The outcomes of these initiatives will also inform the planning process and can be integrated into the Canada Marine Planning Atlas.

### Atlantic Canada Opportunities Agency (ACOA)

ACOA focuses on growing the economy in Atlantic Canada. ACOA has expressed seeing value in MSP through better coordination of federal and provincial regulations (such as for offshore wind development), interprovincial cooperation on marine-related issues, and better understanding of where future protected areas may be established, which in turn helps stakeholders and marine users plan for the future. Furthermore, gaining a better understanding of current activities and stakeholders operating in the marine space was also recognized as an economic benefit of MSP, as such an understanding can help plan for future economic development opportunities.

## 6.3 Provincial government

Discussions between DFO and the Governments of Nova Scotia and New Brunswick are undertaken through Provincial-DFO Aquatic Ecosystems bilateral tables (see [section 2.7](#)). While initial discussions have been on DFO’s process for developing a conservation network, the focus has recently turned to marine spatial planning. To date, information has been shared about the Canada Marine Planning Atlas, the suite of decision-support tools under development, a spatial analysis to inform offshore wind planning, and the scope of this first-generation Marine Spatial Plan. Discussions between the Provincial Governments and DFO on MSP are ongoing.

Nova Scotia has noted its interest in MSP and is undertaking some MSP initiatives of its own including those related to coastal aquaculture. These include an Aquaculture Development Area process to identify and pre-screen sites suitable for marine plants and shellfish in the Argyle area of Southwest Nova Scotia, and a coastal classification process for finfish and shellfish aquaculture around the province. To date, Nova Scotia has highlighted several key considerations related to MSP including:

- Capacity challenges given the broad range of initiatives underway. As such, provincial departments must prioritize based on mandate, capacity and associated determinations of urgency/impact.
- Potential jurisdictional issues as the process evolves, acknowledging that MSP is in its initial stages in Canada as a tool to implement IOM. Early identification of jurisdictional issues will be important to support effective intergovernmental coordination and collaboration.
- Concerns about federal spatial conservation planning and implementation in advance of an established MSP process.

The Government of New Brunswick has noted a general interest in continuing discussions around MSP, with specific areas of interest including:

- Learning more about MSP decision-support tools
- Discussing how marine transportation can be considered in MSP
- Enhanced inter-governmental communications and coordination
- Opportunities for collaboration on coastal and intertidal conservation

## 6.4 Municipal government

Municipalities play an important role in the coastal zone of the planning area through the control of development that may impact adjacent marine areas. Choices around the types, extent, and location of land development including where key infrastructure and industrial development is located, are regulated by municipalities under the *Municipal Government Act* and associated land-use bylaws. Conversely, decisions made about the activities that take place in the marine and coastal areas by other levels and departments of government can affect residents living in municipalities. Coastal aquaculture, fishing, marine transportation, tourism, and many other activities can directly affect the communities near where they are taking place. Lastly, municipalities are a source of local information and data and can play roles in supporting community engagement for initiatives taking place in the coastal zone. For these reasons, it is important to understand what the interests and concerns are for municipalities and the role they can play in the marine spatial planning process.

To this end, a preliminary assessment of Nova Scotia municipalities was conducted in 2022 through a series of focus group sessions entitled, *Understanding the Role, Perspectives, and Priorities of Nova Scotia Municipalities in Marine Spatial*



*Planning in the Maritimes Region of DFO.* This work was done to begin this understanding with municipalities and will be continued as the MSP process unfolds. Through this early work, it became clear that municipal issues, conflicts, and priorities in the coastal zone vary significantly around the province. Key challenges of many municipal governments are the capacity to engage in marine spatial planning processes, navigating through the fragmented jurisdictions in the coastal zone, and the need for accessible information such as coastal vulnerability mapping.

From this early phase of work, the municipalities’ interests included:

- Supporting economic opportunities related to:
  - Tourism
  - Fishing (industry and recreation)
  - Aquaculture
  - Wharf development
- Coastal protection
- Climate change impacts
- Public access to the coast
- Pollution

- The Canada Marine Planning Atlas is a useful tool for larger planning initiatives but has limitations in terms of detailed spatial information about economically important fisheries; the Atlas should continuously be updated with new data as it becomes available.
- There are limitations in the utility of decision-support tools due to biases towards conservation values.
- The fishing industry sees value in the MSP analysis work being undertaken for offshore wind planning and has an interest in ensuring it uses the latest datasets.
- There is interest in establishing a multi-sector body to discuss MSP.

### Other industries

- There is an interest in follow-up sessions on some of the decision-support tools.
- Some uncertainty as to the utility of the Atlas given the resolution of some datasets

## 6.5 Industry groups

The MSP Program is still in the initial stages of engaging with industry groups. As a result, the feedback received from industry groups to date is considered preliminary and engagement will be ongoing. Messages received to date include:

### Fishing industry

- There is interest in ongoing engagement on MSP.
- MSP should have greater regulatory authority to be more effective.
- The Marine Spatial Plan and MSP processes should consider shifting fisheries brought about by climate change and take a forward-looking approach where possible.



Photo credit: J. Morrison

## 6.6 Other groups

Initial discussions with environmental non-government organizations (ENGOS) have started through the existing Maritimes Region DFO-ENGO Forum. This group has met regularly for several years and consists of DFO senior management and a diverse array of environmentally focused non-government organizations. Initial discussions on MSP were generally well received, with ENGO groups providing advice and seeking points of clarification throughout.

Groups directly involved in MSP work were also invited to participate in DFO’s engagement efforts via a series of multi-sector workshops held in the fall of 2023. Important feedback on DFO’s approach to MSP was shared, notably the importance and effectiveness of smaller-scale, community-led MSP. Among the advice received was to:

- Identify knowledge gaps.
- Clarify the goals of MSP and have measures of success identified.
- Make use of integrated management at the federal level.
- Take an evidence-based approach to management and decision-making.
- Ensure partners can feel a part of the process to ensure early and meaningful buy-in.
- Focus on showing how MSP can be useful.
- Identify how MSP can be used at community scales.
- Clarify the linkages to land-based processes and other ocean-related initiatives.

A multi-sector MSP workshop led by Dalhousie University in the winter of 2024 was the source of important considerations and valuable insights about how to enhance the effectiveness of MSP for coastal communities. Some of the key messages from this workshop included the following:

- Information and knowledge related to MSP need to be shared to ensure equitable action.
- Knowledge should come from multiple sources (e.g., local, Indigenous, academic).
- There needs to be meaningful engagement with Indigenous and coastal communities, and building trust is a key part of this process.
- MSP can help advance progress towards conservation targets, and conservation can be treated as an ocean use similar to other sectors.
- The spatial resolution of data and information needs to be considered depending on the use or question at hand (e.g., low-impact coastal recreation is quite different from the potential development of an offshore renewable energy project).
- The impact of climate change on the ocean must be considered in decision-making.
- The importance of engaging youth.

Work will be ongoing to continue gathering feedback from interested groups and incorporate it where possible into DFO’s future MSP work.



# 7

## Marine Spatial Plan implementation and evaluation

### 7.1 Plan implementation

Implementation of the Plan will occur in collaboration with federal, provincial and municipal government departments, First Nations and Indigenous communities, and various marine sectors and groups, such as industry and community-based organizations. The goals, objectives and information contained in the Plan can provide guidance and context in a number of ways, such as:

- Enhancing existing planning and management systems and structures, such as those in place for fisheries, aquaculture, energy and other sectors
- Supporting efforts to address management priorities and issues that cross multiple sectors, such as addressing cumulative effects and interactions related to new or expanded activities
- Facilitating area-based planning efforts at various scales, such as bays and coastal communities, to address local priorities or issues



## 7. Marine Spatial Plan implementation and evaluation

A range of mechanisms, tools and approaches can be used to support MSP implementation, including but not limited to the following:

- Collaborative and shared work plans (e.g., multi-year projects)
- Funding arrangements (e.g., federal contribution agreements)
- Research and development projects (e.g., development and application of planning and decision-support tools)
- Formal collaboration agreements (e.g., intergovernmental memoranda of understanding, letters of intent or governance tables)

Effective evaluation and learning from implementation activities under the current Plan will provide important direction for the future.

### 7.2 Plan evaluation

This document has been evaluated against the National Guidance for Marine Spatial Planning in Canada to ensure that the process being undertaken is consistent with national MSP principles and expectations. Over time, a series of additional metrics can be developed to help measure and demonstrate progress of this planning process so that additional efforts can be directed to areas in need of improvement. This work will be done in addition to the reporting on any of the implementation mechanisms mentioned in Section 7.1.



## ANNEX A

# Social and economic overview

The Atlantic Coast, the offshore Scotian Shelf, and the Bay of Fundy support a diverse array of marine activities, including, fishing, shipping, conservation, energy, aquaculture, telecommunications, defense, research, and recreation, as well as non-extractive uses including cultural practices. Many of these activities are directly dependent on the marine ecosystem. Economic benefits from ocean activities are reported by province, rather than marine region, making it difficult to identify economic benefits from specific ocean area. For example, in 2018, the marine sector was estimated to have contributed \$6,049 million to provincial GDP in Nova Scotia and \$2,024 million in New Brunswick (Statistics Canada 2021). These estimates cover all major private sector activities with a direct dependence on the oceans (extractive and non-extractive uses) as well as activities of public sector organizations with responsibilities for safety, managing ocean activities and research. Therefore, the ocean industries conducted in the Scotian Shelf and Bay of Fundy planning area make significant economic contributions to Nova Scotia and New Brunswick. One of the aims of the Plan is to foster economically prosperous maritime sectors and communities by supporting marine activities carried out in a sustainable manner. Several of the key activity areas are profiled.

## Fishing

Drivers of fishing activities include social, cultural, and economic values. Today, oceans, aquatic ecosystems, and marine waterways hold significant social, cultural and economic importance to both non-Indigenous and Indigenous peoples. Since pre-contact, Indigenous people have fished primarily for subsistence (food), social, and cultural purposes. However, the relationship between Indigenous communities and aquatic resources is intertwined with every facet of their lives, including cosmological belief systems, knowledge translation and education, political and family organization, and trade and economies (McMillan and Prosper 2016). Many Indigenous communities participate in communal commercial fisheries, Food, Social, and Ceremonial fisheries, and moderate livelihood fisheries.

Many non-Indigenous people and communities also see fishing as a key element of regional culture and individual identity, with multi-generational levels of involvement. Commercial fishing occurs in most areas for a variety of species. Three major species groups are fished commercially in the planning area: groundfish (e.g., cod, haddock, pollock, redfish, flatfishes); pelagic fish (e.g., herring,

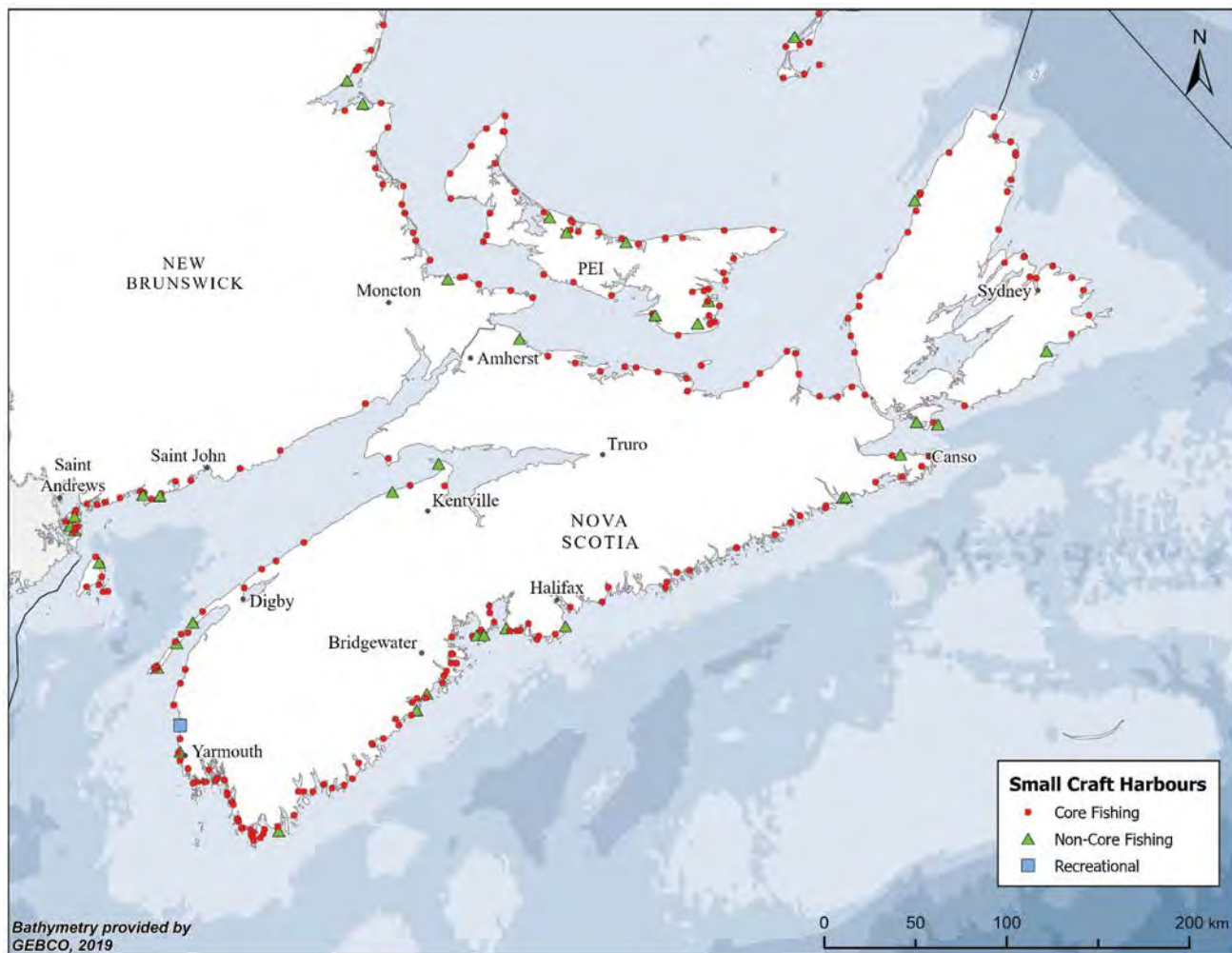
swordfish, sharks, tuna); and shellfish (e.g., snow crab, lobster, scallop, shrimp). The Bay of Fundy, Georges Bank and the western Scotian Shelf support important fisheries for scallop, lobster and groundfish. Lobster is important in coastal areas throughout the planning area. The area from Digby to Shelburne supports the most productive lobster fishery in the country. The cool waters of the eastern Scotian Shelf support important crab, clam and shrimp fisheries. Fisheries for swordfish and tuna occur in the deeper waters of the shelf edge and slope during the summer months. The fishing industry has responded to much change over the last twenty-five years. The formerly dominant groundfish fisheries now occur mostly on the western Scotian Shelf and in the Gulf of Maine. Across the planning area, new species are being exploited and existing fisheries for many species of shellfish have expanded. Fish harvesters are increasingly sharing the offshore with other emerging ocean uses, and coastal areas with aquaculture operations. Climate change is also expected to affect fisheries. In addition, fisheries management has changed to incorporate ecosystem considerations in managing fisheries, such as impacts on habitat and other species.

The commercial fishing industry, comprised of two subsectors, fishing and seafood processing, is a source of employment for many Indigenous, rural, and coastal communities in DFO Maritimes Region, with approximately 9,600 people employed each year (Government of Canada 2023). Those employed in the commercial fishing or seafood processing industries tend to reside in rural areas.

Maritimes Region represents less than four percent of Canada's coastline, yet in 2020, it accounted for 40 percent of the total landed value of Canadian commercial fisheries (DFO 2023c). The Region's commercial fishery maintained a record-level landed value in 2020 of \$1.64 billion (DFO 2023c). The Region has 9 Marine Stewardship Council (MSC) -certified fisheries, more than any other DFO region. In 2019, the total landed value by Communal Commercial license holders was \$81 million (DFO 2021a). The three top inshore species by landed value in the Region are lobster (\$1 billion), snow crab (\$171 million), and scallop (\$153 million) (DFO 2023c). Inshore lobster represents 61 percent of the Region's landed value (DFO 2023c). Harvesters in the Region are the only Canadian lobster producers for 12 months of the year.

There are approximately 11,500 registered fish harvesters and 3,650 active vessels in the Region (DFO 2023c). The Region has 400 ports with landings: 38 ports have landings worth at least \$10 million and 155 ports have landings worth at least \$1 million (DFO 2021a). Small craft harbours in both the Maritimes and Gulf Regions fall under the DFO Maritimes Region's portfolio. As of October 2023, this includes 173 harbours in the Maritimes Region and 117 in the Gulf Region for a total of 290 harbours across Nova Scotia, New Brunswick, and Prince Edward Island ([Figure 17](#)) (DFO 2024b).





**FIGURE 17** Location of Small Craft Harbours in the Scotian Shelf and Bay of Fundy planning area in 2023.

## Shipping

Commercial shipping in the area is generally tankers, and general bulk and containerized cargo carriers. Halifax, Port Hawkesbury, and Saint John are the largest ports in the region (Transport Canada 2020). Regional ferry, tug, and barge services are important components of the sector. Servicing the cruise ship industry also provides important economic benefits with the main ports of call for cruise ships in Halifax, Sydney, and Saint John. The 2018 Census of Canada determined that marine transportation accounts for 23 percent of the employed labour force in Canada (Statistics Canada 2021). The Atlantic provinces generate \$35.5 billion annually from marine imports and

exports, which account for 32.1 percent of regional GDP (Council of Canadian Academies 2017).

International agreements and national legislation (*Canada Shipping Act 2001* and its Regulations) controlling pollution from ships have long been in place, while ballast water management measures continue to evolve per international agreements and guidelines. Regional management priorities include pollution prevention and response, control of aquatic invasive species, vessel-source noise, whale protections and carbon reduction initiatives.

## Conservation

Conservation of the marine environment is considered an activity like any other which can occur in coastal or offshore areas. In addition to its inherent benefit, it can enhance other uses such as fishing or tourism by protecting key ecosystem processes and supporting healthy and productive ecosystems. In 2010, Canada committed to the marine conservation targets established under the United Nations Convention on Biological Diversity, which included conserving 10 percent of coastal and marine areas by 2020.<sup>8</sup> In 2018, the G7 *Charlevoix Blueprint for Healthy Oceans, Seas and Resilient Coastal Communities* further committed Canada and other developed countries to supporting strategies to effectively protect and manage vulnerable areas of our oceans and resources. The Government of Canada has supported these commitments and others with significant investments in ocean conservation and protection. Canada surpassed the 10 percent target in August 2019 and is now working towards an ambitious new target of conserving 25 percent of Canada's oceans by 2025 and 30 percent by 2030. Currently, 14.66 percent of Canada's marine and coastal areas are conserved. Various tools can be used to achieve marine conservation targets, including establishing

Marine Protected Areas and Other Effective area-based Conservation Measures. See [Figure 5](#) for existing marine conservation areas in the Maritimes Region.

*Oceans Act* **Marine Protected Areas** (MPAs) are established by DFO to protect and conserve marine species, habitats, and ecosystems. MPAs may allow some current and future activities depending on their impacts to the MPA's conservation objectives. For new federal MPAs established after April 25, 2019, the Government of Canada plans to prohibit the following activities, with limited exceptions: oil and gas exploration, development and production; mineral exploration and exploitation; disposal of waste and other matter, dumping of fill, and deposit of deleterious drugs and pesticides; and, fishing via bottom-trawl gear. Additionally, the Government of Canada intends to enhance restrictions on certain vessel discharges within MPAs.

A marine **Other Effective Area-based Conservation Measure** (OECM) is a geographically defined area other than a Marine Protected Area which is governed and managed in ways that achieve positive and sustained long-term outcomes for the conservation of biodiversity with associated ecosystem functions and services and where applicable, cultural, spiritual, socio-economic, and other locally

8 Aichi Biodiversity Targets. 2020. Available from [Aichi Biodiversity Targets \(cbd.int\)](http://cbd.int)





relevant values. OECMs are similar to MPAs as they both contribute to biodiversity conservation by prohibiting or otherwise managing human activities within their boundaries. To qualify as an OECM and continue to maintain OECM status over time, risks to the area's biodiversity conservation objectives must be avoided or mitigated, where possible. One type of OECM is a marine refuge, which is a fisheries-area closure established under the Fisheries Act that meets the criteria in the Government of Canada's 2022 Marine OECM Guidance.

An **Ecologically Significant Area (ESA)** is an area-based conservation tool established in regulations under the Fisheries Act, intended to conserve and protect key areas of fish and fish habitat over the long term. ESAs regulate activities to a higher standard and may prohibit certain activities. ESAs are not intended to regulate fishing, but other activities that may impact the ESA-specific conservation and protection objectives. There are no designated ESAs in Canada currently; however, DFO is exploring an ESA case study for the St. Mary's River and estuary to determine the feasibility as a potential ESA candidate, involving Mi'kmaq and other partners in the assessment. While the initial focus for ESAs is on freshwater and coastal areas, ESAs can be designated in offshore areas as well and are a conservation tool that could be considered in MSP. The framework of identifying, establishing, and managing ESAs can be found [here](#).

**National Marine Conservation Areas (NMCAs)**, established by Parks Canada, protect and conserve areas of Canada's oceans and Great Lakes for the benefit and enjoyment of the public. NMCAs are required to include at least two types of zones: one that fosters and encourages ecologically sustainable use and another that fully protects special or sensitive features of the area's ecosystem. Activities detailed in the MPA Protection Standard are also prohibited in NMCAs established after April 2019.

**National Wildlife Areas and Migratory Bird Sanctuaries**, established by ECCC, are for wildlife conservation, research, and interpretation. Activities that are prohibited vary by site. When National Wildlife Areas, Migratory Bird Sanctuaries, and National Parks include a marine component, those aspects can be counted as MPAs and would abide by the federal MPA Protection Standard.

**Indigenous Protected and Conservation Areas (IPCAs)** are lands and waters where Indigenous governments have the primary role in protecting and conserving ecosystems through Indigenous laws, governance and science. Culture and language are the heart and soul of IPCAs, which are Indigenous-led, represent a long-term commitment to conservation, and elevate Indigenous rights and responsibilities.<sup>9</sup> Only Indigenous peoples can determine when to apply this term, per their own laws, traditions, and designation protocols.

(Photo credit: Scott Leslie)



9 Recommendations from the Indigenous Circle of Experts in "We rise together: Achieving pathway to Canada Target 1 through the creation of Indigenous Protected and Conserved Areas in the spirit and practice of reconciliation" and pan-Canadian guidance on Indigenous Protected and Conserved Areas in "One with nature."



# Marine energy

## Oil and gas

Oil and gas exploration has occurred mainly in the offshore Scotian Shelf portion of the planning area. Oil and gas activities in this area are regulated by the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB), an independent joint agency created by the Governments of Canada and Nova Scotia.

Two offshore energy projects recently ended production in the Offshore Scotian Shelf and are in the decommissioning and abandonment stages: the Sable offshore Energy Project and Deep Panuke Offshore Gas Development Project. More recently, the Scotian Basin Exploration Drilling Project completed its activities. The Sable Offshore Energy Project, operated by ExxonMobil, was Canada's first offshore natural gas project, with production beginning in 1999. The project has been a significant source of revenue for the Government of Nova Scotia, which received \$900 million from the project in 2008. The project produced 60 billion cubic meters or 2.1 trillion cubic feet of natural gas from five offshore fields. Production from this project was shut down in 2018. All facilities from the project were removed by November 2020 and a post-abandonment monitoring program began in the summer of 2021. The Deep Panuke Development Project, operated by Ovintiv Canada, started natural gas production in 2013 from four wells in an offshore field located approximately 250 km southwest of Halifax. Natural gas production from this project occurred season-ally from 2015 to 2018, with production taking place in the colder months when natural gas prices were higher. The volume of gas production from this project was 147.2 billion cubic feet. Production from the Deep Panuke Project ended in May 2018 and decommissioning and abandonment activities are underway. The Scotian Basin Exploration Drilling Project, operated by BP Canada, received authorization and approval from the CNSOPB and the Minister of ECCC by April 2018. The one-well exploration drilling project was completed in November 2019 and BP Canada has not filed any applications for further wells. Interest in exploration in the region is currently low compared to previous years.

A long-standing moratorium on oil and gas exploration exists for Georges Bank. Under the *Canada-Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (i.e., *Accord Act 1988*), the moratorium has been extended to December 31<sup>st</sup>, 2032, at which time the Governments of Canada and Nova Scotia will assess the area. The future of exploration activities within the region, including seismic surveys and exploratory wells, requires effective coordination and communication among the oil and gas industry, regulators, and other ocean-use sectors. While a significant amount of research has been carried out on the impacts of oil and gas activities, more work is required in this area. Key risks associated with offshore hydrocarbon development include potential noise impacts on marine animals, disruption to fisheries, and pollutant discharges and oil spills.

## Tidal

In Canada, offshore renewable energy (ORE) is regulated at both provincial and federal levels. ORE is also sometimes referred to as marine renewable energy and is used here to refer to tidal energy and offshore wind energy. The Government of Nova Scotia regulates ORE within provincial waters (such as the Bay of Fundy) under the authority of the *Marine Renewable Energy Act*. In federal waters, the Canada Energy Regulator is the lifecycle regulator of ORE projects.

Tidal energy is generated from the movement of water due to the rise and fall of the tides.<sup>10</sup> Within Maritimes Region, several milestones have been set in the research and development of tidal energy. In 1984, North America's first tidal barrage was installed at Annapolis Royal. The Annapolis Tidal Power Plant had a capacity of 20 MW and operated until 2019.

The Bay of Fundy has been the focus of efforts to harness renewable tidal energy, due to its high tides and high potential for energy. The Fundy Ocean Research Centre for Energy (FORCE), located in Parrsboro Nova Scotia, is Canada's first in-stream tidal energy demonstration facility and research centre. In-stream tidal energy is extracted using underwater turbines. At FORCE, single bottom-mounted gravity-based turbines have been tested to date and successfully connected to Nova Scotia's electrical grid. Other focus areas for tidal energy

10 What is marine renewable energy? 2017. Available from: <https://natural-resources.canada.ca/energy/energy-sources-distribution/renewables/marine-energy/what-marine-renewable-energy/7371>

development within the Bay of Fundy include Grand Passage (between Brier Island and Long Island) and Petite Passage (near Digby). A horizontal axis floating turbine has been deployed and tested within Grand Passage and successfully connected to the electrical grid. Environmental research and monitoring efforts to understand the effects of tidal energy are ongoing.

The Tidal Task Force on Sustainable Tidal Energy Development in the Bay of Fundy, co-chaired by DFO and NRCan, is advancing efforts to address regulatory issues that may affect tidal energy projects. These efforts include establishment of a Risk and Monitoring Working Group and examination of ways that scientific advice can be leveraged to inform decision making for future tidal energy projects (DFO 2024c).

## Wind energy

Wind energy is one of the fastest-growing energy sectors in the world due to its affordability, its potential for creating local investments and local job opportunities, and its ability to meet requirements for reducing greenhouse gas emissions. Onshore wind power is the largest contributor to renewable energy in Nova Scotia, as the Province has over 300 commercial wind turbines (Nova Scotia Power 2024). Between 2010 and 2017, Nova Scotia added 493 MW of onshore wind capacity (Canada Energy Regulator 2022).

Offshore wind energy development is rapidly increasing worldwide. As of 2021, 56 gigawatts (GW) of offshore wind was operational, representing about 7 percent of total installed wind capacity (Global Wind Energy Council 2022). The offshore wind industry is in the early stages of development in Canada, and it represents a significant potential source of clean energy and economic opportunities. No offshore wind farms have been developed to date; however, work is underway to explore the viability of offshore wind in Atlantic Canada due to the strong offshore wind resource available.

In 2022, announcements made by both the Government of Nova Scotia and the Government of Canada provided strong signals that offshore wind development is being pursued at federal and provincial levels of government.

- The Minister of ECCC announced that Regional Assessments of offshore wind development in Newfoundland and Labrador and Nova Scotia would proceed. Led by the Impact Assessment Agency of Canada, Regional Assessments are conducted under the authority of the *Impact Assessment Act*, to better understand the regional context concerning a specific issue and to inform future impact assessments. Regional Assessments are public processes and feedback from the public is requested at various stages. Outcomes of the Nova Scotia Regional Assessment will inform siting decisions for offshore wind energy development in the Regional Assessment study area, which encompasses the Scotian Shelf and Southern Gulf of St. Lawrence.
- NRCan and Nova Scotia's Ministry of Natural Resources and Renewables jointly declared federal and provincial intent to expand the mandate of the Canada–Nova Scotia Offshore Petroleum Board to include the regulation of ORE in the Accord Area. Federal and provincial amendments to the *Canada–Nova Scotia Offshore Petroleum Resources Accord Implementation Act* (1988) will be required to implement this mandate. Following legislative amendments, the CNSOPB will be renamed the Canada–Nova Scotia Offshore Energy Regulator (CNSOER).

Regulatory changes related to ORE have also either been initiated or are ongoing. Under the *Canadian Energy Regulator Act*, NRCan is developing offshore renewable energy regulations (ORER) that will outline the technical requirements for future site assessments, surveys, geotechnical sampling or testing, installation, operation, and decommissioning in federal waters. It is also anticipated that the CNSOPB (CNSOER in the future) will develop regulations for the area governed by the *Accord Act* that closely mirror the federal ORER. Future regulatory regime development will include the processes needed to lease areas of the seabed and overlying water column for ORE development, which will have implications for marine spatial planning.

## Aquaculture

Aquaculture occurs along the Atlantic Coast and within the Bay of Fundy. New Brunswick has the largest aquaculture industry in Eastern Canada and the second largest in Canada behind British Columbia. The main species produced are Atlantic Salmon and Blue Mussels, with most of the value coming from salmon farming. Additional farmed species include Rainbow Trout, American Oyster, Bay Quahog and Arctic Char. The total value of the aquaculture industry in Nova Scotia and New Brunswick in 2018 was about \$377 million.

The Marine Spatial Plan will support DFO's efforts to promote intergovernmental cooperation and planning as well as Indigenous and stakeholder involvement in aquaculture. DFO has recently been providing information and support to an initiative led by Nova Scotia's Department of Fisheries and Aquaculture and the Municipality of Argyle in Nova Scotia. This work is exploring the development and approval of a larger Aquaculture Development Area to expedite approvals and support this economic development opportunity in Nova Scotia.

In addition, Nova Scotia is currently undertaking a Coastal Classification System to help identify areas more suitable for finfish and shellfish aquaculture. This project was initiated in 2022/23 with the expertise of the Nova Scotia Centre for Marine Applied Research (CMAR). Biological and physical criteria to classify the suitability of the waters and collect relevant data, developed in the project's first year, will be applied to design coastal classification maps. Once developed, this system will be a tool that industry and community can use to proactively identify potentially suitable sites for aquaculture, and it will be referenced by decision-makers in the aquaculture licensing application process.

## Tourism and recreation

Most marine tourism activities occur in coastal areas of the planning area. Sport fishing, duck hunting, boat tours, whale watching, kayaking, diving, surfing, and beach visits are all aspects of the tourism industry that depend on the region's marine and coastal environments. Cruise ship tourism is described in the shipping section. Recreational fishing includes salt-water and estuarial fishing using charter vessels and guides, and personal vessels and facilities. Recreational fisheries in the Maritimes Region extend from the northern tip of Cape Breton to the New Brunswick-Maine border and are important for the economic activity they generate each year. DFO is responsible for providing sustainable recreational harvesting opportunities as part of integrated management plans consistent with its policies. Nova Scotia's tourism sector contributed \$998 million to provincial GDP and employed over 20,000 individuals (Statistics Canada 2023). In New Brunswick, the sector contributed \$676 million to provincial GDP and employed over 15,000 individuals. In both provinces, tourism contributed to more than 4% of employment in 2019.

## Land-based activities

Land-based activities, ranging from development to manufacturing to municipal wastewater systems to agricultural activities, have an impact on water, sediment, and air quality of the marine environment. Distant sources of pollution affect the Scotian Shelf due to transport from the St. Lawrence River and Gulf of St. Lawrence and deposition from the atmosphere. In fact, pollution from local sources is considered a lower source of contaminants on the Scotian Shelf than distant sources. Pollution, eutrophication, and hypoxia are mainly concerns in coastal waters. Marine debris, often from land-based sources, is an entanglement and ingestion threat for many species. Microplastics, minute particles of plastic easily ingested by marine life, are of increasing concern.

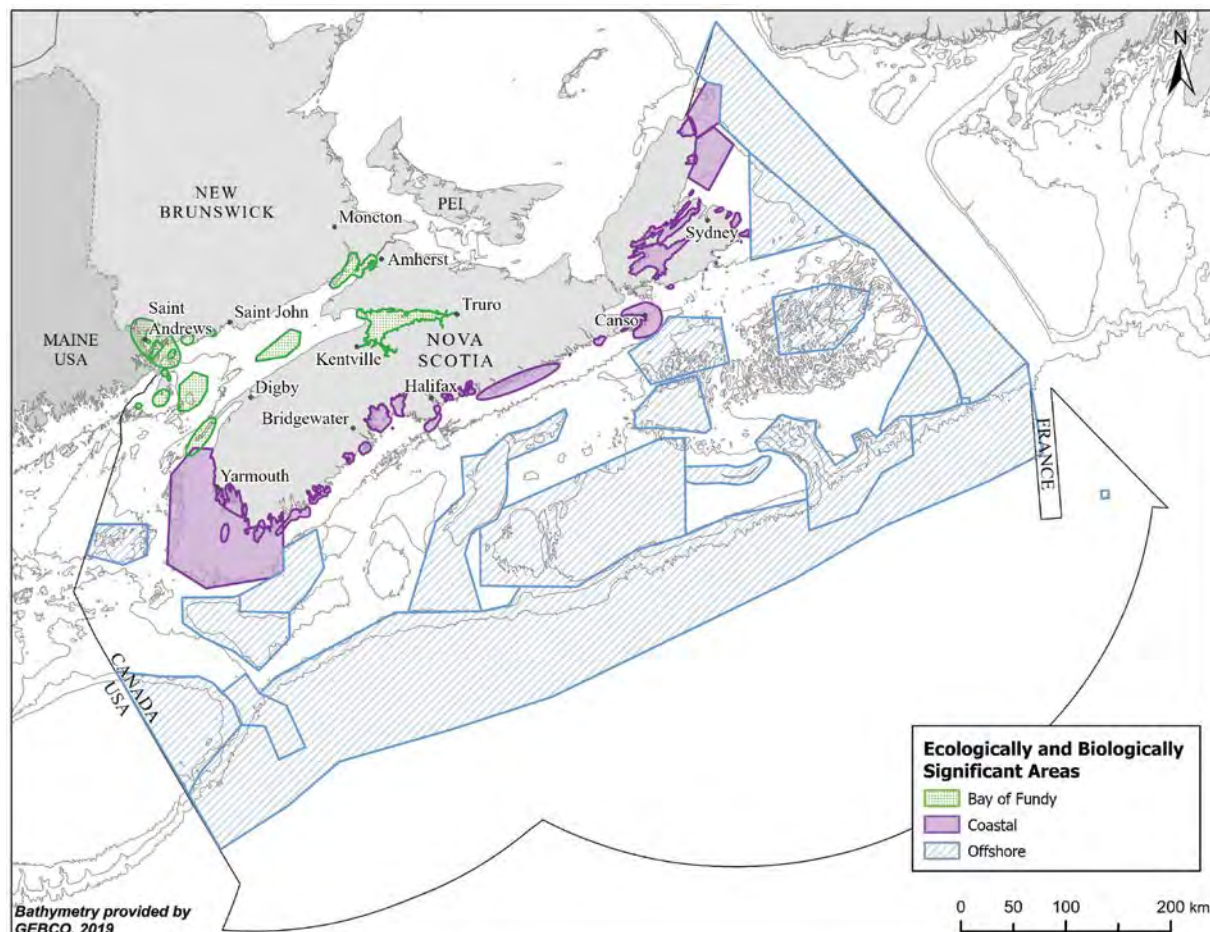


## ANNEX B

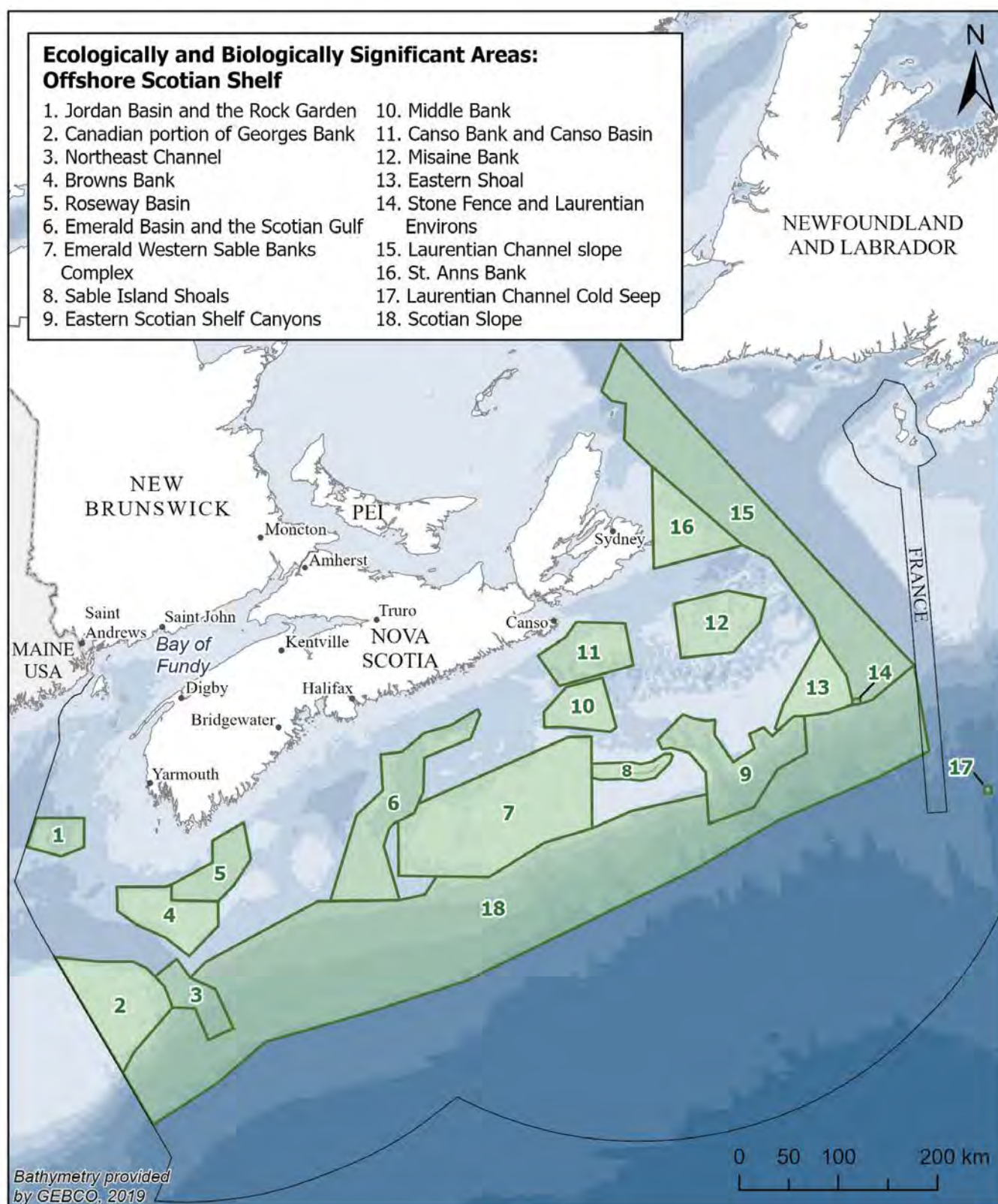
# Ecologically and Biologically Significant Areas

Ecologically and biologically significant areas (EBSAs) are areas of particularly high ecological or biological importance relative to other areas in a region (Hastings *et al.* 2014). The identification of an area as an EBSA does not give it any special legal status or automatically trigger a management response. However, a higher degree of risk aversion may be required in the management of activities affecting

EBSAs. Within the Maritimes Region, EBSAs have been identified for both the offshore and coastal environments (Figure 18). Coastal EBSAs are important components of the Marine Conservation Network. EBSAs in coastal and offshore regions are shown in Figure 19 and Figure 20. EBSAs in the Bay of Fundy are shown in Figure 21.



**FIGURE 18** All Ecologically and Biologically Significant Areas in the Scotian Shelf and Bay of Fundy planning area.



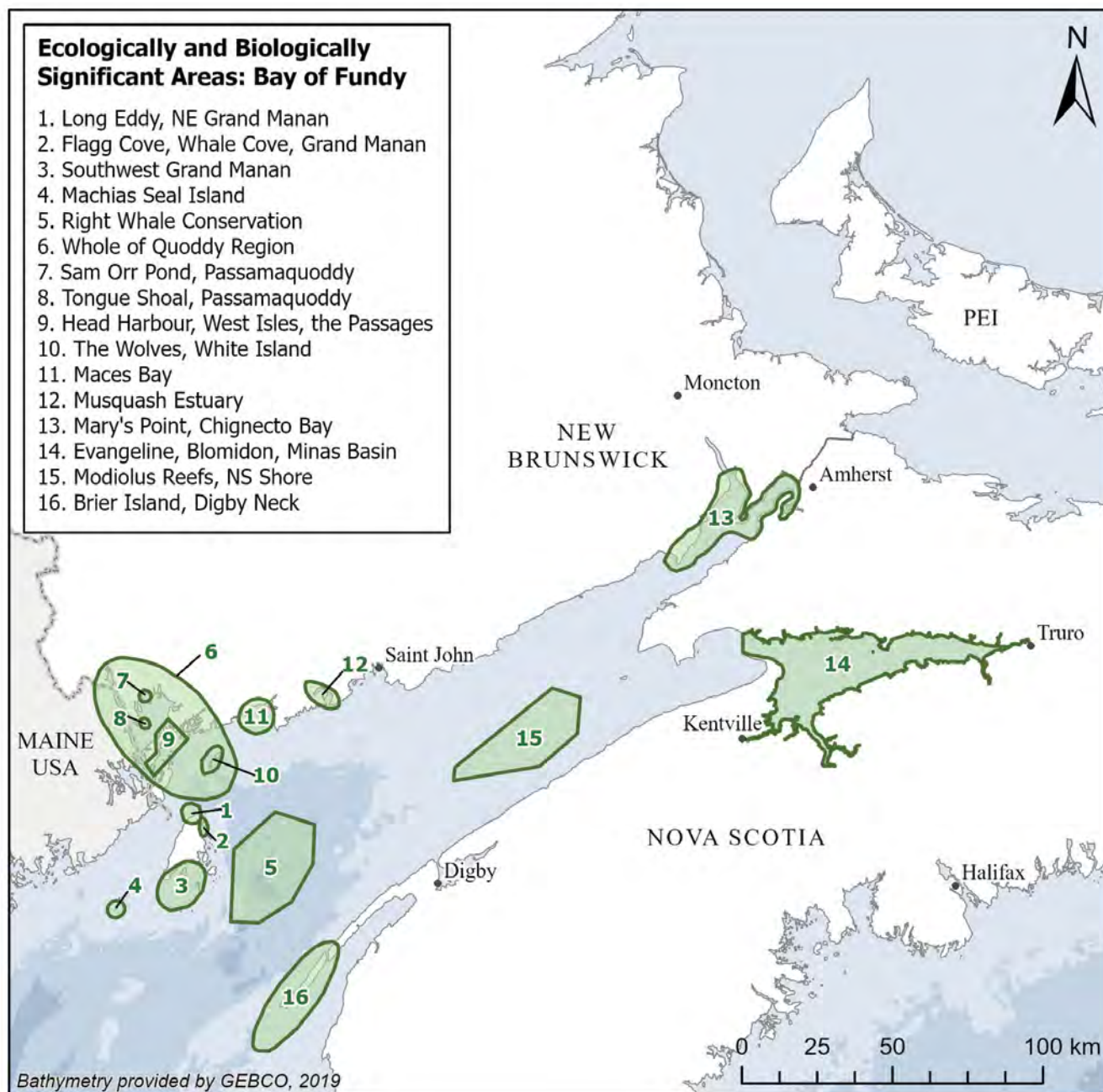
**FIGURE 19** Offshore Ecologically and Biologically Significant Areas in the Scotian Shelf and Bay of Fundy planning area.





**FIGURE 20** Coastal Ecologically and Biologically Significant Areas in the Scotian Shelf and Bay of Fundy planning area.





**FIGURE 21** Ecologically and Biologically Significant Areas in the Bay of Fundy.

## ANNEX C

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FIRST-GENERATION

# Marine Spatial Plan

Scotian Shelf and Bay of Fundy

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